Brother's Academy

SYLLABUS FOR ADMISSION TEST

COURSE - 1 (For Students of Class 7 going to Class 8)

These few topics of Class 7 as well as the basic syllabus of Class 6

Sample Test Paper can be collected from BA campus. It is also available online at www.brothersacademy.co.in

Physics	Chemistry	Biology	Maths
1. Motion	1. Acids, Bases and Salts	1. Nutrition in Animals	1. Number System
2. Heat	2. Electrolysis	2. Conservation of natural resources	2. Polynomials
3. Light	3. Carbon	3. Digestion	3. Ratio
4. Magnetism	4. Matter	4. Soil and Climate	4. Exponents
	5. Metals and Non-Metals	5. Respiration	5. Speed, Time and Distance
	6. Solution	6. Parts of Plants	6. Linear equations in one variable
	7. Pollution		7. Lines and angles
			8. Triangles
			9. Perimeter and Area of Plane figures

COURSE -2 (For Students of Class 8 going to Class 9)

These few topics of Class 8 as well as the basic syllabus of Class 7

Sample Test Paper can be collected from BA campus. It is also available online at www.brothersacademy.co.in

Physics	Chemistry	Biology	Maths
1. Motion	1. Fibres	1. Food Production & Management	1. Number system
2. Light	2. Atomic Structure	2. Cell	2. Square and Square Roots
3. Heat	3. Atoms and Molecules	3. Micro organisms	3. Cube and Cube Roots
4. Sound	4. Combustion	4. Conservation of Plants & Animals	4. Polynomials
5. Electricity	5. Coal and Petroleum	5. Reproduction in Animals	5. Speed, Time and Distance
	6. Acids and Bases		6. Linear equations in one variable
	7. Chemical and Physical Changes		7. Lines and angles
			8. Triangles, Quadrilaterals, Polygons
			9. Perimeter and area of plane figures

COURSE - 3 (For Students of Class 9 going to Class 10)

These few topics of Class 9 as well as the basic syllabus of Class 8

Sample Test Paper can be collected from BA campus. It is also available online at www.brothersacademy.co.in

Physics	Chemistry	Biology	Maths
1. Motion	1. Gaseous State	1. Cell	1. Number System
2. Laws of Motion	2. Matter	2. Tissue	2. Polynomials, Ratio and Exponents
3. Gravitation	3. Atoms and Molecules	3. Diversity in Living World	3. Triangles, Quadrilaterals
4. Floatation	4. Elements, Compound and Mixture	4. Improvement in food resources	4. Perimeter and Area of Plane figures
5. Waves	5. Metals and Non-Metals	5. Digestive System	5. Linear equations in (1 & 2 variables)
	6. Carbon		6. Trigonometry
			7. Co-ordinate Geometry
			8. Volume and surface area
			9. Algebraic expressions and identities

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SYLLABUS FOR ADMISSION TEST

COURSE - 4 (For Students of Class 10 going to Class 11) : Engineering (IIT-JEE)

These few topics of Class 10 as well as the basic syllabus of Class 9

Sample Test Paper can be collected from BA campus. It is also available online at www.brothersacademy.co.in

Physics	Chemistry	Maths
1. Current Electricity	1. Acids, Bases and Salts	1. Linear equations in two variables
2. Optics	2. Chemical reactions and equations	2. Trigonometry
3. Magnetism	3. Metals and Non-Metals	3. Triangles and its properties
	4. Carbon and its compound	4. Quadratic equations
	5. Periodic Properties	5. Arithmetic Progression
		6. Co-ordinate Geometry
		7. Height and Distance
		8. Circles
		9. Area related to circle
		10. Surface area and volume
		11. Probability

COURSE - 6 (For Students of Class 12 Appeared/Passed) Engineering

These Few Topics of Class 12

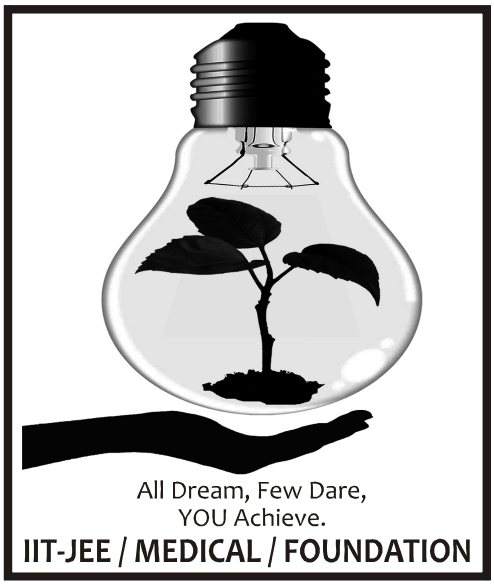
Sample Test Paper can be collected from BA campus. It is also available online at www.brothersacademy.co.in

Physics	Chemistry	Maths
1. Electrostatics	1. Hydrocarbon & Alkyl Halides	1. Differential Calculus
2. Capacitor	2. Alcohols & Carbonyl Compounds	2. Integral Calculus
3. Current Electricity	3. Amines, Carboxylic Acid & derivatives	3. Vector & 3D-Geometry
4. Magnetism	4. Electrochemistry	4. Probability
5. E.M.I & A.C	5. Solid State	5. Determinant & Matrices
6. Optics	6. Liquid Solution	
7. Modern Physics	7. Chemical Kinetics	
8. Semiconductor & logic gates	8. p-Block & d- Block	
	9. Co-ordination Compounds	

ADMISSION TEST

Code A

Brother's Academy



Course 1

Class 7 going to Class 8 Students

Read the following Instructions very carefully before you proceed

SAMPLE COPY

- The paper is divided into **THREE PARTS**. PART - I contains 60 question of **Scientific Aptitude.** PART - II contains 40 question of **Science** .
  Part - III contains 20 question of **Mathematics**.
- It contains a total of **120 questions** and **24 printed pages.**
- For answering a question, an ANSWER SHEET is provided separately. Please fill your Reg. No. and Paper set Properly in the space given in the ANSWER SHEET.
- Please darken the entire circle that corresponds to your answer for each question. Use only HB pencil or Ball Point Pen to mark answer, and erase pencil marks completely to make a change. Do not scribble anything on the answer sheet.

Wrong way of filling

A B C D A B C D

Right way of filling

A B C D

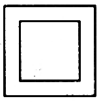
- **Full Marks 360. Total Time $2\frac{1}{2}$ Hrs**.
- Marking Scheme : ONLY ONE correct option and each question carries **3** Marks and **–1** will be awarded for every wrong answer. **(NEGATIVE MARKING).**

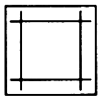
Name : _____ **Reg. No. :** _____

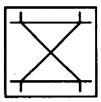
PART – I (Scientific Aptitude)

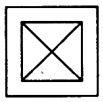
(Single Correct Type)

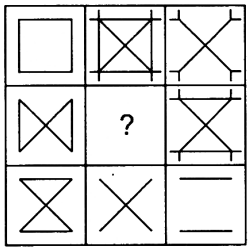
01. Select a figure from the options which will complete the given figure matrix.

(A) 

(B) 

(C) 

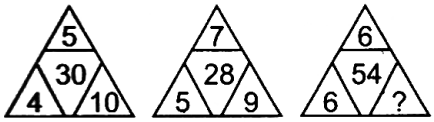
(D) 



02. Ajay runs 30 m towards East, turns right and runs 20 m. He turns right and runs 8 m. He again turns left and runs 6 m and then turns left and runs 15 m. Finally he turns left and runs 7m. In which direction is he facing now?

(A) North (B) North-East (C) East (D) West

03. Find the missing number, if same rule is followed in all three figures.



(A) 38 (B) 36 (C) 12 (D) 15

SPACE FOR ROUGH WORK

04. Eight friends A, B, C, D, E, F, G and H are sitting in a circle facing the centre.

(i) A, who is sitting immediately between G and C, is just opposite to F.

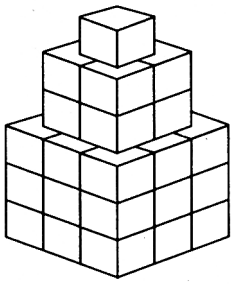
(ii) E who is sitting immediately between H and C, is second to the right of A and second to the left of F.

(iii) D is sitting second to the left of G.

Who is sitting between D and G?

(A) A (B) B (C) F (D) E

05. Count the number of cubes of same size in the given figure.



(A) 35 (B) 36 (C) 26 (D) 34

06. In a certain code language, '315' means 'good sweet fruit', '632' means 'good red rose' and '295' means 'rose and fruit'. Which of the following stands for 'fruit' in that language?

(A) 1 (B) 5 (C) 3 (D) 2

07. Which of the following Venn diagrams correctly describes the relationship amongst, "Clothes, Flowers and Bright things"?

(A)  (B)  (C)  (D) 

SPACE FOR ROUGH WORK

08. Select a figure from the options which satisfies the same conditions of placement of dots as in Fig. (X)

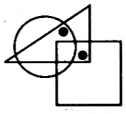
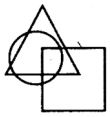
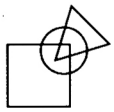
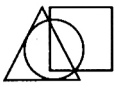
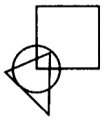


Fig. (X)

(A)  (B)  (C)  (D) 

09. Select the correct mirror image of Fig. (X), if the mirror is placed vertically to the left.

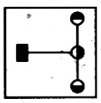
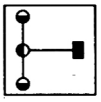
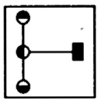
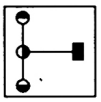
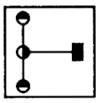
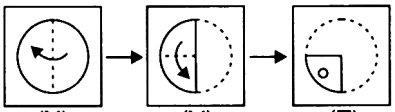


Fig. (X)

(A)  (B)  (C)  (D) 

10. A set of three figures X, Y and Z showing a sequence of folding of a piece of paper is given. Fig. (Z) shows the manner in which the folded paper has been cut. Select the option which shows the unfolded form of Fig.(Z)

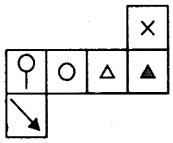
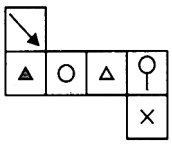
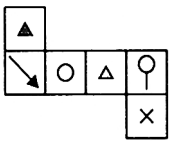
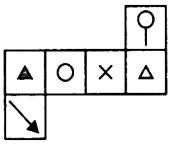


(X) (Y) (Z)

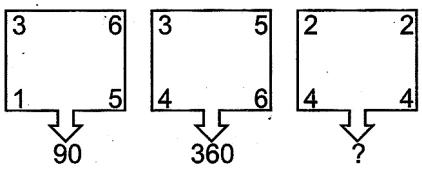
(A)  (B)  (C)  (D) 

SPACE FOR ROUGH WORK

11. Which of the following nets can be used to form the given cube?

(A)  (B)  (C)  (D) 

12. Find the missing number.

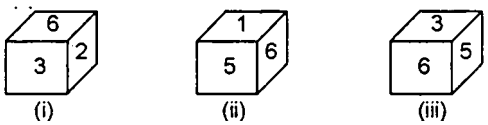


(A) 64 (B) 400 (C) 360 (D) 380

13. Today is Sunday. After 94 days, it will be:

(A) Wednesday (B) Sunday (C) Tuesday (D) Saturday

14. Which number is at the opposite of the number 6 ?



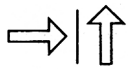
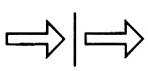
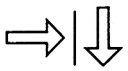
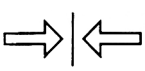
(A) 1 (B) 2 (C) 3 (D) 4

15. What is the angle between the two hands of a clock, when the clock shows 3 hours 25 minutes?

(A) $45\frac{1}{2}^{\circ}$ (B) 46° (C) $46\frac{1}{2}^{\circ}$ (D) $47\frac{1}{2}^{\circ}$

SPACE FOR ROUGH WORK

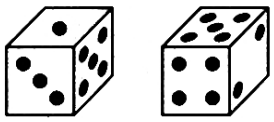
16. Which pair of figures shows a reflection over the line segrnent ?

(A)  (B)  (C)  (D) 

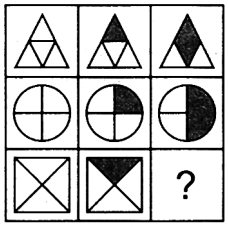
17. Two positions of a dice are shown. If two dots are on the bottom, then how many dots will be on the top ?

(A) 1 (B) 3

(C) 6 (D) 5



18. Which of the following figures will complete the given figure matrix?



(A)  (B)  (C)  (D) 

19. Find out from the options which is the mirror-image of the given word, if the mirror is placed vertically right.

CONTENTS

(A) ƨTИƎTИOƆ (B) ƨTИƎTИOƆ (C) STNETNOC (D) CONTENTS

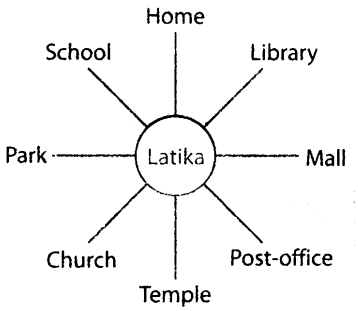
20. In a row of girls facing north, Garima is 3rd from left end and Latika is 19th from right end. If 40 girls are in row, then how many girls are there between Garima and Latika ?

(A) 17 (B) 18 (C) 20 (D) 12

SPACE FOR ROUGH WORK

Direction (21-26) :

Answer the questions based on the direction and places given in the figure.



21. Latika is facing home. She will be facing ____ if she makes a $\frac{1}{4}$ turn to her right.

(A) School (B) Library (C) Temple (D) Mall

22. Latika is facing park.She will be facing _____ if she makes a $\frac{1}{2}$ turn to her left.

(A) School (B) Mall (C) Temple (D) Library

23. Latika is facing temple. What will she be facing if she makes a $\frac{3}{4}$ turn to her left ?

(A) Park (B) Mall (C) Temple (D) Library

24. Latika is facing the school. What will she be facing if she makes a $\frac{1}{4}$ turn to her left ?

(A) Park (B) Mall (C) Church (D) Post - office

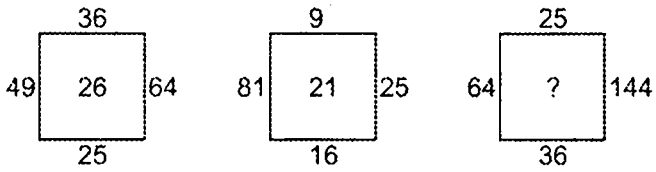
SPACE FOR ROUGH WORK

25. Latika is facing the library. What will she be facing if she makes a $\frac{1}{2}$ turn to her right ?

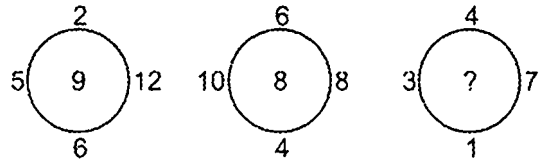
(A) Park (B) Church (C) Mall (D) Home

26. Latika is facing the mall. What will she be facing if she makes a $\frac{3}{4}$ turn to her right ?

(A) Home (B) Post - office (C) Library (D) Temple

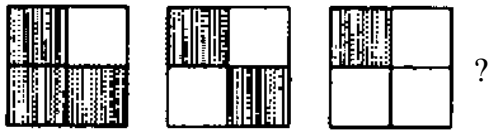
27. 

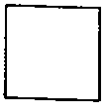
(A) 19 (B) 23 (C) 25 (D) 31

28. 

(A) 5 (B) 6 (C) 7 (D) 8

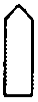
Which one of the four figures on the right should come next (Q 29-30).

29.  ?

(A)  (B)  (C)  (D) 

SPACE FOR ROUGH WORK

30. 

(A)  (B)  (C)  (D) 

31. There were 35 students in a hostel. Due to the admission of 7 new student the expenses of the mess were increased by Rs. 42 per day while the average expenditure per bead diminished by Rs 1. What was the original expenditure of the mess ?

(A) 425 (B) 410 (C) 420 (D) 430

32. Out of 9 persons, 8 persons spent Rs. 30 on each of their meals. The ninth one spent Rs.20 more than the average expenditure of all the nine. The total money spent by all of them was :

(A) Rs. 260 (B) Rs. 290 (C) Rs. 292.50 (D) Rs. 400.50

33. After replacing an old member by a new member, it was found that the average age of five members of a club is the same as it was 3 years ago. What is the difference between the ages of the replaced and the new member?

(A) 2 years (B) 4 years (C) 8 years (D) 15 years

34. Two trains start from opposite directions 200 km apart at the same time. They cross each other at a distance of 110 km from one of the stations. What is the ratio of their speeds?

(A) 11 : 20 (B) 9 : 20 (C) 11 : 9 (D) 17 : 9

35. An express train travelled at an average speed of 100 km / hr, stopping for 3 minutes after every 75 km. How long did it take to reach its destination 600 km from the starting point ?

(A) 6 hrs 21 min (B) 6 hrs 24 min (C) 6 hrs 27 min (D) 6 hrs 30 min

SPACE FOR ROUGH WORK

36. A walks around a circular field at the rate of one round per hour while B runs around it at the rate of six rounds per hour. They start in the same direction from the point at 7.30 a.m. They shall first cross each other at :

(A) 7.42 a.m. (B) 7.48 a.m. (C) 8.10 a.m. (D) 8.30 a.m.

37. Twelve men can do a job in 8 days. Six days after they start, 4 more men join them. How many more days will it take to do the job ?

(A) 2.5 days (B) 3.5 days (C) 1.5 days (D) 6 days

38. A, B and C can do a Job in 11,20 and 55 days respectively. How soon can the work be done if A is assisted by B and C on alternate days ?

(A) 7 days (B) 9 days (C) 8 days (D) 10 days

39. 24 men can complete a work in 16 days. 32 women can complete the same work in 24 days. 16 men and 16 women started working and worked for 12 days. How many more man are to be added to complete the remaining work in 2 days ?

(A) 16 (B) 24 (C) 36 (D) 48

40. An electric pump can fill a tank in 3 hours. Because of a leak in the tank, it took $3\frac{1}{2}$ hours to fill the tank. If the tank is full, how much time will the leak take to empty it ?

(A) 20 hours (B) 21 hours (C) 22 hours (D) 23 hours

41. Find the unit digit in the product $254 \times 361 \times 159 \times 18$.

(A) 6 (B) 4 (C) 8 (D) 3

42. If the product of three consecutive integers is 720, then their sum is:

(A) 54 (B) 45 (C) 27 (D) 36

SPACE FOR ROUGH WORK

43. In order to increase sales, price of a product was decreased by 20%. The net sales increased by 28%. What is the increase in unit sales?

(A) 48% (B) 50% (C) 60% (D) 83%

44. $\frac{2}{5}$ of the voters promise to vote for P and the rest promised to vote for Q. Of these, on the last day 15% of the voters went back of their promise to vote for P and 25% of voters went back of their promise to vote for Q, and P lost by 2 votes. Then, the total number of voters is:

(A) 100 (B) 110 (C) 90 (D) 95

45. An amount of Rs. 735 was divided between A, B and C. If each of them had received Rs. 25 less, their shares would have been in the ratio of 1 : 3 : 2, The money received by C was:

(A) Rs. 195 (B) Rs. 200 (C) Rs. 225 (D) Rs. 245

46. Zinc and copper are melted together in the ratio 9:11. What is the weight of melted mixture, if 28.8 kg of zinc has been consumed in it?

(A) 58 kg (B) 60 kg (C) 64 kg (D) 70 kg

47. 80 L of mixture of milk and water is in the ratio 5:3. If 16 L of this mixture is replaced by 16 L of milk, ratio of milk and water becomes:

(A) 2 : 1 (B) 6 : 3 (C) 7 : 3 (D) 8 : 3

48. A bought a cycle and spent Rs. 110 on its repairs. He then sold it to B at a profit of 20%. B sold it to C at a loss of 10%. C sold it at a profit of 10% for Rs. 1,188. What is the price A paid to buy that bicycle:

(A) Rs. 850 (B) Rs. 870 (C) Rs. 930 (D) Rs. 890

SPACE FOR ROUGH WORK

49. Two horses were sold for Rs. 12,000 each, one at a loss of 20% and the other at a gain of 20%. The entire trasaction resulted in:

(A) no loss, no gain (B) loss of Rs. 1,000

(C) gain of Rs. 1,000 (D) gain of Rs. 2,000

50. An article is sold at a certain price. By selling it at $\frac{2}{3}$ of that price one loses 10%. Find the gain percent at original price.

(A) 31% (B) 23% (C) 35% (D) 45%

Read the following and answer questions from 51 to 55.

Nitrogenous materials formed due to metabolic activities are needed to be removed. The biological process involved in the removal of these harmful metabolic wastes from the body is called excretion. Different organisms use varied strategies to do this. Many unicellular organisms remove these wastes by simple diffusion from the body surface into the surrounding water while complex multicellular organisms use specialised organs to perform the same function.

51. The excretory system of human beings include

(A) a pair of kidneys, a pair of ureters, a urinary bladder and a urethra

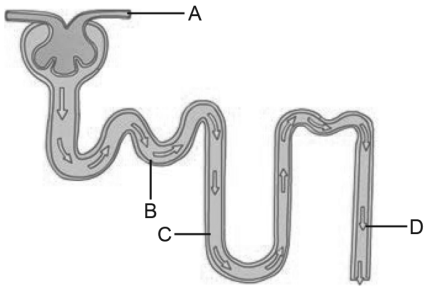
(B) a pair of kidneys, a pair of urinary bladders, a ureter, and a urethra

(C) a pair of kidneys, a pair of ureters, a pair of urinary bladders and a urethra

(D) a kidney, a ureter, a urinary bladder and a urethra

SPACE FOR ROUGH WORK

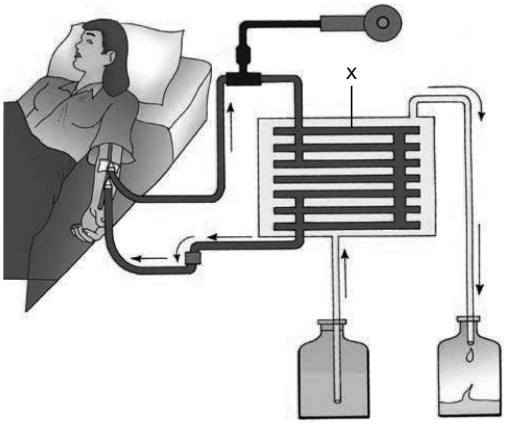
52. The given figure represents the structure of a nephron.



Which section of the nephron is responsible for concentrating the solute in the filtrate?

(A) A (B) B (C) C (D) D

53.



Study the picture given above and choose the correct combination of information provided in the following table.

	x	Process used	Function
(A)	Dialyser	Diffusion	To remove the excess wastes and fluid from the blood
(B)	Blood thinner	Clotting	To remove the clots from the blood
(C)	Dialysate	Osmosis	To add fluid to the blood
(D)	Dialysing pump	Filtration	To draw blood from the body and send it to dialyser

SPACE FOR ROUGH WORK

54. Which of the following statement(s) is (are) true about excretion in human beings?

I. Kidneys are the primary excretory organs.

II. The bladder is muscular, so it is under nervous control.

III. Each kidney has large number of filtration units called nephrons.

IV. Urine is stored in the urethra until the urge of passing it out.

(A) I and II only (B) I and III only (C) I, II and III only (D) I and IV only

55. Study the table below and select the row that has the incorrect information.

	Excretory Organ	**Substances Excreted**
(A)	Kidneys	Nitrogenous wastes
(B)	Lungs	Urea
(C)	Skin	Sweat
(D)	Oil glands	Sebum

Read the following and answer questions from 56 to 60.

Metals are elements that exhibit a variety of physical properties such as those of malleability, ductility, conductivity of heat and electricity, lustre, etc. Due to such properties, metals find usage in purpose such as cooking utensils, machinery, modes of transportation, construction, etc., in our daily life. Metals such as gold and silver have been used in making jewellery since ancient times. Non-metals have been found to exist in all the three states— solid, liquid and gaseous. They are non-malleable, non-ductile and are brittle in nature. Non-metals have very low tensile strength and are easily broken up.

56. Which of the following metal(s) will have very low melting point?

(A) Gallium (B) Caesium (C) Copper (D) Both (A) and (B)

SPACE FOR ROUGH WORK

57. The metal which is known as strategic metal is

(A) zirconium (B) titanium (C) manganese (D) all of these

58. Metals can be given different shapes according to our needs because

(A) they are malleable and ductile (B) they are sonorous

(C) they are generally hard (D) they have a shining surface

59. Which of the following non-metal is a good conductor of electricity?

(A) Oxygen (B) Nitrogen (C) Graphite (D) Bromine

60. Metals produce a metallic sound. This property of metal is called

(A) malleability (B) sonority (C) conductivity (D) ductility

SPACE FOR ROUGH WORK

PART – II (Science)

(Single Correct Type)

61. Charging can be done through

(A) Friction (B) Conduction (C) Induction (D) All of these

62. Which of the following is an insulator ?

(A) Copper (B) Gold (C) Plastic (D) Human body

63. We should avoid bathing in swimming pool during lightning because

(A) Water attracts charges

(B) Water in swimming pool is a good conductor of electricity

(C) Water becomes hot in lightning

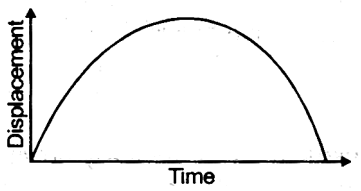
(D) Swimming causes lightning to fall

64. The velocity of a body moving in a straight line at the end of 5 s is 30 m / s , at the end of 12 s is 58 m / s and at the end of 22 s , it is 98 m / s. The body is moving with

(A) Uniform velocity (B) Unifrom acceleration

(C) Zero velocity (D) Uniform retardation

65. The graph predicts the condition of



(A) Body is undergoing positive acceleration

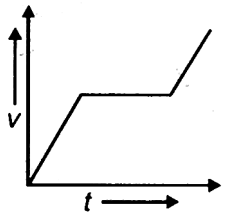
(B) Body is undergoing negative acceleration

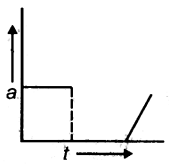
(C) Uniform velocity

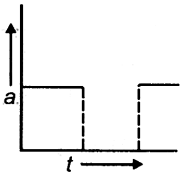
(D) Uniform speed

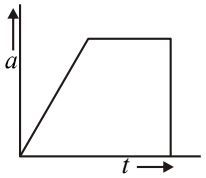
SPACE FOR ROUGH WORK

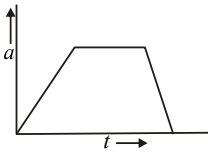
66. Which of the following would probably show the acceleration time graph for a body whose velocity - time graph is shown in figure ?



(A) 

(B) 

(C) 

(D) 

67. Silk fibre is made up of

(A) Carbohydrate (B) Lipids (C) Protein (D) Fats

68. State whether the statements given below are True or False .

(i) Stone is transparent while glass is opaque (ii) Chalk dissolves in water

(iii) Metals have lustre (iv) Diamond is a metal

(A) F F T F (B) T T T T (C) F F F F (D) T F T F

69. Which of the following species found in the aqueous solution of weak acid ?

(A) Only molecules (B) Only ions

(C) Both molecules and ions (D) Weak acids doesn't dissociate at all

70. What's common among motion of the planets around the sun , blinking of lights and occuring of seasons?

(A) Irreversible changes (B) Chemical changes

(C) Periodic changes (D) Undesired changes

SPACE FOR ROUGH WORK

71. Two samples X and Y are tested with various indicators . The observations are listed in the following table.

Sample	Phenolphthalein	Methyl orange
X	Colourless	Red
Y	Pink	Yellow

What are samples X and Y ?

(A) X is HCl and Y is NaOH (B) X is NaOH and Y is HCl

(C) X is NaOH and Y is KOH (D) X is HCl and Y is HNO_3

72. Which of the following set of substances contain acids ?

(A) Grapes , lime water (B) Vinegar , soap

(C) Curd , milk of magnesia (D) Curd , Vinegar

73. Ice $\rightarrow$ Liquid water $\rightarrow$ Water vapour

The type of energy that must be added for the ice to change to liquid water is .....

(A) Light energy (B) Mechanical energy (C) Sound energy (D) Heat energy

74. The correct way of making a solution of acid in water is to

(A) Add water to acid (B) Add acid to water

(C) Simultaneous mixing of acids and water (D) Add water to acid in a shallow container .

75. What is the composition ratio of nitrogen and oxygen in the air respectively ?

(A) 1 : 4 (B) 1 : 9 (C) 4 : 1 (D) 1 : 1

76. The leaves of a plant are green because it contains:

(A) Ribosomes (B) Nucleus (C) Chlorophyll (D) Mitochondria.

SPACE FOR ROUGH WORK

77. Which of the following is a saprotroph?

(A) Rose (B) Coral root (C) Neem (D) Mango

78. On adding iodine solution to starch it:

(A) Turns blue black (B) Turns green (C) Turns red (D) No change.

79. Rhizobium bacteria lives in the root nodules of:

(A) Wheat (B) Rice (C) Barley (D) Peas.

80. The process of nutrition in animals have ___ steps:

(A) Three (B) Four (C) Five (D) Six.

81. The constant movement of____by paramecium pushes the food particles along with:

(A) Cilia (B) Tentacles (C) Feeding tube (D) Sticky tongue.

82. The mouth parts of insects are modified to form a structure to suck liquid food which is:

(A) Feeding tube (B) Sticky web (C) Tentacles (D) Cilia.

83. Part of alimentary canal that absorbs the digested food:

(A) Stomach (B) Small intestine (C) Large Intestine (D) Oesophagns

84. Force between two charged body A and B is repulsive, when

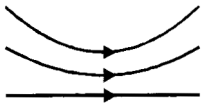
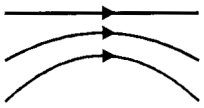
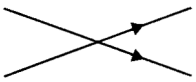
(A) A is positive and B is negative

(B) When A and B are kept very far away from each other

(C) Product of charges on A and B is greater than zero

(D) Product of charges on A and B is equal to zero

85. Choose the correct option which represents magnetic field lines due to uniform magnetic field.

(A)  (B)  (C)  (D) 

SPACE FOR ROUGH WORK

86. Magnetic field inside a current carrying solenoid is

(A) Directly proportional to its length (B) Directly proportional to the current

(C) Inversely proportional to number of turns (D) Inversely proportional to the current

87. Magnetic field at a point due to a long straight current carrying conductor depends upon

(A) Current passing through the conductor

(B) Distance of the point from the current carrying conductor

(C) Either (A) or (B)

(D) Both (A) & (B)

88. The temperature at which no more energy can be removed from the matter is called

(A) Absolute zero (B) Boiling point (C) 32°F (D) 32°C

89. Which species among the following is a nitride ion ?

(A) Na^+ (B) NO_3^- (C) NH_4^+ (D) N^{3-}

90. How do group 17 elements exist ?

(A) As diatomic molecules (B) Only in ionic form

(C) Only in compound (D) As single atom

91. A disease kwashiorkor is caused by deficiency of:

(A) Vitamin (B) Proteins (C) Carbohydrates (D) Fats

92. Vitamin E is important for:

(A) Protecting cells (B) Vital tissue protection

(C) Both A and B (D) Development of bones.

93. What should be done for species preservation:

(A) Protecting areas that have endangered species

(B) Protecting the breeding grounds of endangered species

(C) Issuing hunting licence to VIP's

(D) Both A and B

SPACE FOR ROUGH WORK

94. Egg in carpel is known as:

(A) Stigma (B) Style (C) Ovary (D) Ovule.

95. A mirror forms a virtual image of a real object.

(A) It must be a convex mirror (B) It must be a concave mirror

(C) It must be a plane mirror (D) It may be any of the mirrors mentioned above

96. An object is placed at the centre of curvature of a concave mirror. The distance between its image and the pole is

(A) Equal to f (B) Between f and 2f (C) Equal to 2f (D) Greater than 2f

97. A ray of light is incident on a concave mirror. If it is parallel to the principal axis, the reflected ray will

(A) Pass through the focus (B) Pass through the centre of curvature

(C) Pass through the pole (D) Retrace its path

98. As the temperature of a liquid solvent increases , the amount of solute that can dissolve in it

(A) Decreases by one degree celcius for every ml of solvent

(B) Increases

(C) Decreases

(D) Remains constant

99. If an element a has valency y and element B has valency x, in that case if both combine, what will be the formula ?

(A) AB (B) A_xB_y (C) A_yB_x (D) $(AB)_{xy}$

100. Which of the following has variable valency ?

(A) Iron (B) Chlorine (C) Nitrogen (D) Sodium

SPACE FOR ROUGH WORK

PART – III (Mathematics)

(Single Correct Type)

101. Each side of a regular polygon is 1.2 cm, and the perimeter is 14.4 cm then the number of sides is

(A) 14 (B) 13 (C) 12 (D) 15

102. There are 10 cards in a box, with numbers from 1 to 10 marked on them, what is the probability of drawing an even numbered card ?

(A) $\frac{1}{10}$ (B) $\frac{1}{5}$ (C) $\frac{1}{4}$ (D) $\frac{1}{2}$

103. One of the angle among two supplementary angles is 52^o more, then the smallest angle is

(A) 68° (B) 112° (C) 64° (D) None

104. If $\frac{6}{1+n}$ is a natural number then the sum of all such numbers is

(A) 11 (B) 12 (C) 10 (D) 13

105. The area of a rhombus is 80 sq. cm. One of its diagonals is 16 cm. The other diagonal is

(A) 5 cm (B) 8 cm (C) 16 cm (D) 10 cm

106. The mode of the following data : 11, 12, 16, 15, 1, 19, 15, 16, 16, 15, 18, 15, 17, 16, 15, 15, 11, 13, 15, 17, 15, 13, is

(A) 15 (B) 14 (C) 13 (D) 12

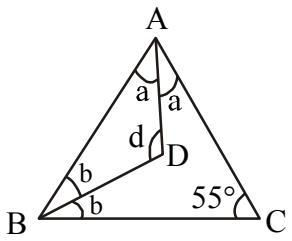
107. What is the value of $\angle d$ in the given figure ?

(A) 107.5^o

(B) 120^o

(C) 200^o

(D) 117.5^o



SPACE FOR ROUGH WORK

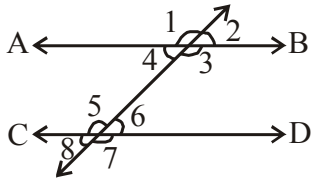
108. If 20 is added to four times a certain number, the result is 5 less than five times the number. Then the number is :

(A) 10 (B) 15 (C) 20 (D) 25

109. Solve for x : $\frac{x+2}{6}-\left[\frac{11-x}{3}-\frac{1}{4}\right]=\frac{3x-4}{12}$

(A) $\frac{6}{11}$ (B) 10 (C) 14 (D) 11

110. In the given figure $AB \| CD$ and $\angle 2 = (3x-10)°, \angle 8 = (5x-30)°$, then find the value of $\angle 2$ and $\angle 8$ are



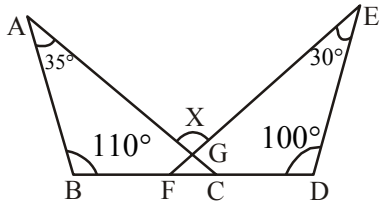
(A) 10^o, 10^o

(B) 20^o, 20^o

(C) 40^o, 90^o

(D) 60^o, 60^o

111. Find the value of x in the given diagram is



(A) 70^o

(B) 95^o

(C) 110^o

(D) 120^o

112. The denominator of a fraction exceeds the numerator by 5. If 3 be added to both, the fraction becomes 3/4. Find the fraction.

(A) $\frac{12}{17}$ (B) $\frac{12}{15}$ (C) $\frac{12}{13}$ (D) $\frac{12}{11}$

113. $(x+4)(x+3)-(x-4)(x-3)$ is equal to

(A) $2x^2-14x+24$ (B) $2x^2+14x-24$ (C) $14x$ (D) 24

SPACE FOR ROUGH WORK

114. The difference between the greatest number and the least number of $\frac{5}{9}, \frac{1}{9}, \frac{11}{9}$ is:

(A) $\frac{2}{9}$ (B) $\frac{4}{9}$ (C) $\frac{10}{9}$ (D) $\frac{2}{3}$

115. Find the value of $124 \times 4 - 3 + 118 \div 2$?

(A) 552 (B) 496 (C) 553 (D) –553

116. Meena can type 500 words in 10 minutes and Leena can type 400 words is 10 minutes. They can together type 3600 words in :-

(A) 50 min (B) 40 min (C) 80 min (D) 100 min

117. Which of the following is not a pythagorean triplet?

(A) (8, 15, 17) (B) (12, 35, 38) (C) (18, 80, 82) (D) (10, 24, 26)

118. In a school of 6,422 students ratio of girls to boys 5 : 8, $\frac{1}{5}$ th of the girls and $\frac{1}{8}$ th of the boys took part in a school camp . Fraction of the total strength took part in the camp is

(A) $\frac{2}{13}$ (B) $\frac{2}{7}$ (C) $\frac{3}{11}$ (D) $\frac{2}{9}$

119. In a triangle ABC, $\angle ABC = 50°, \angle BAC = 30°,$ then the longest side is : -

(A) AB (B) BC (C) CA (D) None

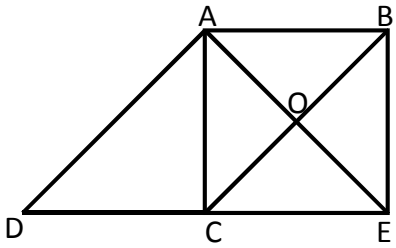
120. In the given figure, ABCD is a parallelogram, $\angle ADE = 50^o$ and $\angle ACE = \angle BED = 90^o$. The value of $\angle EAC + \angle ABC - 2\angle DAC$ is ;

(A) 20^o

(B) 10^o

(C) 30^o

(D) 40^o



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SPACE FOR ROUGH WORK

ANSWER KEY

Code A

Course 1

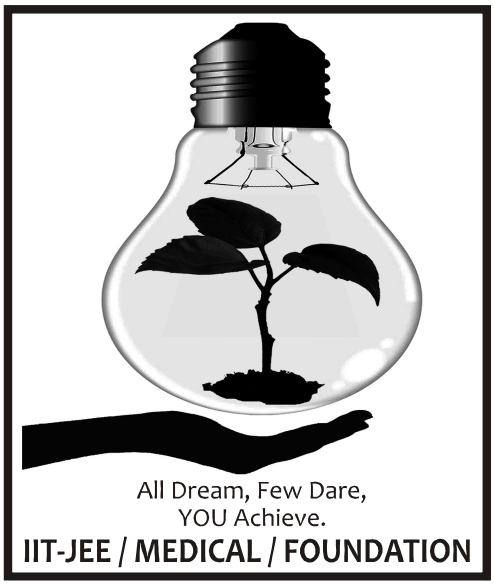
Class 7 going to Class 8 Students

PART - I						PART - II				PART - III	
01.	B	21.	D	41.	C	61.	D	81.	A	101.	C
02.	A	22.	B	42.	C	62.	C	82.	A	102.	D
03.	D	23.	A	43.	C	63.	B	83.	B	103.	C
04.	B	24.	C	44.	A	64.	B	84.	C	104.	B
05.	B	25.	B	45.	D	65.	B	85.	C	105.	D
06.	B	26.	A	46.	C	66.	B	86.	B	106.	A
07.	D	27.	D	47.	C	67.	C	87.	D	107.	D
08.	A	28.	A	48.	A	68.	A	88.	A	108.	D
09.	B	29.	A	49.	B	69.	C	89.	D	109.	D
10.	C	30.	D	50.	C	70.	C	90.	A	110.	B
11.	B	31.	C	51.	A	71.	A	91.	B	111.	B
12.	A	32.	C	52.	C	72.	D	92.	C	112.	A
13.	A	33.	D	53.	A	73.	D	93.	D	113.	C
14.	D	34.	C	54.	C	74.	B	94.	D	114.	C
15.	D	35.	A	55.	B	75.	C	95.	D	115.	A
16.	D	36.	A	56.	D	76.	C	96.	C	116.	B
17.	B	37.	C	57.	D	77.	B	97.	A	117.	B
18.	B	38.	C	58.	A	78.	A	98.	B	118.	A
19.	A	39.	B	59.	C	79.	D	99.	B	119.	A
20.	B	40.	B	60.	B	80.	C	100.	A	120.	B

ADMISSION TEST

Code A

Brother's Academy



Course 2

Class 8 going to Class 9 Students

Read the following Instructions very carefully before you proceed

SAMPLE COPY

- The paper is divided into **THREE PARTS**. PART - I contains 60 question of **Scientific Aptitude.**
  PART - II contains 40 question of **Science**.
  Part - III contains 20 question of **Mathematics**.
- It contains a total of **120 questions** and **27 printed pages.**
- For answering a question, an ANSWER SHEET is provided separately. Please fill your Reg. No. and Paper set Properly in the space given in the ANSWER SHEET.
- Please darken the entire circle that corresponds to your answer for each question. Use only Ball Point Pen to mark answer. Do not scribble anything on the answer sheet.

Wrong way of filling

A B C D A B C D

Right way of filling

A B C D

- **Full Marks 360. Total Time $2\frac{1}{2}$ Hrs.**
- Marking Scheme : ONLY ONE correct option and each question carries **3** Marks and **–1** will be awarded for every wrong answer. **(NEGATIVE MARKING).**

Name : _____ **Reg. No. :** _____

PART – I (Scientific Aptitude)

(Single Correct Type)

Direction (01 to 02) Find the missing term in the series given below.

01. 2, 12, 30, ?, 90, 120

(A) 48 (B) 56 (C) 63 (D) 72

02. 2, 5, 11, 17, ?

(A) 23 (B) 19 (C) 16.5 (D) 18

Direction (03 to 04). Study the following series carefull and answer the question given below:

7 M 4 P % J V 1 K 3 @ E W 2 Q / 6 T A 8 Z I 5 $ F U # 9 H N

03. Which of the following is the sixth to the left of ninth from the left of the above arrangement

(A) $ (B) T (C) W (D) None of these

04. How many such consonants are there in the arrangement, each of which is immediately proceeded by a symbol and immediately followed by 2 numbers?

(A) Four (B) One (C) Two (D) Three

Direction (05 to 06) In each of the following questions, arrange the given words in the sequence in which they occur in the dictionary and then choose the correct sequence.

05. 1. Brook 2. Bandit 3. Boisterous 4. Baffle 5. Bright

(A) 2, 4, 3, 1, 5 (B) 2, 4, 3, 5, 1 (C) 4, 2, 3, 1, 5 (D) 4, 2, 3, 5, 1

SPACE FOR ROUGH WORK

06. 1. Wound 2. Writer 3. Whiter 4. Worst 5. Worked

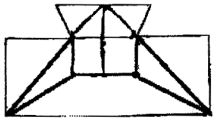
(A) 1, 4, 3, 5, 2 (B) 2, 1, 3, 4, 5 (C) 3, 5, 4, 1, 2 (D) 5, 3, 2, 1, 4

07. How many points will be on the face opposite to the face which contains two points.



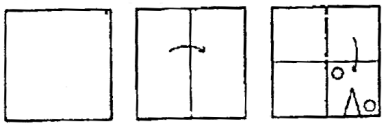

(A) 1 (B) 4 (C) 5 (D) 6

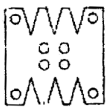
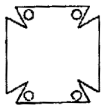
08. How many minimum line segment required to draw the given figure?



(A) 16 (B) 15 (C) 18 (D) 19

09. A piece of paper is folded as shown in the figure & then punched:



(1)  (2)  (3)  (4) 

Choose the correct option from the answer figure which appears the same when unfolded

(A) 1 (B) 2 (C) 3 (D) 4

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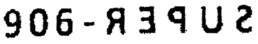
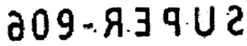
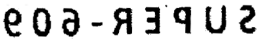
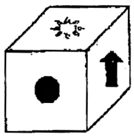
10. A mirror is placed vertically as shown in the figure. Choose the correct option for mirror image.

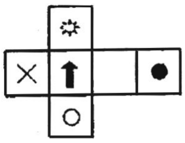
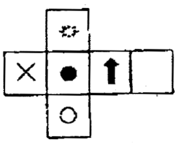
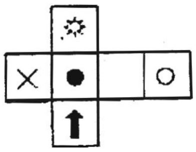
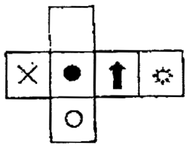
S U P E R - 6 0 9

(A)  　　(B) 

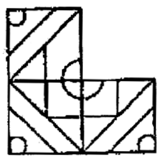
(C)  　　(D) 

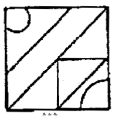
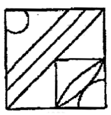
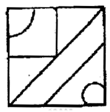
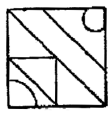
11. Which of the given Net from the answer options when folded will results in the given cube?



(A)  　(B)  　(C)  　(D) 

12. Which of the alternatives will complete the figure?



(i)  　(ii)  　(iii)  　(iv) 

(A) (iii)　(B) (i)　(C) (ii)　(D) (iv)

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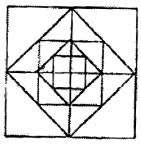
13. How many squares are there in the given figure?

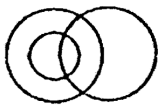
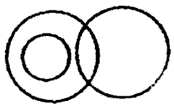
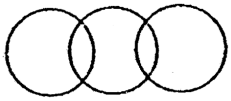
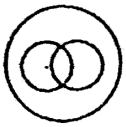


(A) 11 (B) 17 (C) 13 (D) 16

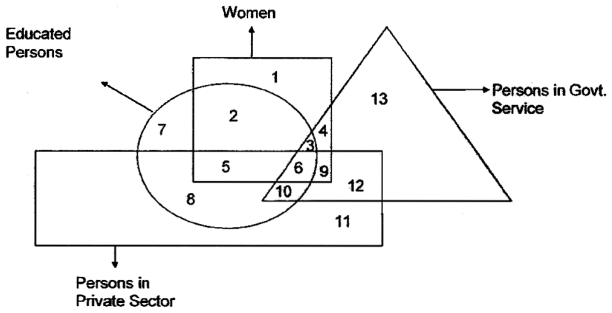
14. If in a certain code language 'THREAT' is written as 'RHTTAE' then how will 'PEARLY' be written in that code

(A) YLRAEP (B) YLRPAE (C) AEPYLR (D) AEPRYL

15. Which is the following diagram best depicts the relationship between Males, Husbands and Doctors?

(A)  (B)  (C)  (D) 

Directions : (16 to 17) In the venn diagram given below, the square represents women, the triangle represents persons who are in Govt Service, the circle represents educated persons and the rectangle represents persons working in private sector. Each section of the diagram is numbered. Study the diagram and answer the following questions.



16. Which number represent educated women, who are in Govt. job?

(A) 2 (B) 3 (C) 4 (D) 6

SPACE FOR ROUGH WORK

17. Which number represents the uneducated women, who have Govt. Jobs as well as jobs in private sector?

(A) 6 (B) 4 (C) 12 (D) 9

18. Rana travels 10 km North turns left and travels 4 km and then again turns right and covers another 5 km. He then turns to right hand side and travels antother 4 km. How far is he form the point starting his journey ?

(A) 15 km (B) 4 km (C) 5 km (D) 10 km

Directions : (19 to 20) Read the following information carefully and answer the questions given bellow

M, P, J, B, R, T and F are sitting round a circle facing the centre. B is the third to the left of J who is second to the left of M. P is third to the left of B and second to the right of R. T is not an immediate neighbour of M.

19. Who is fourth to the right of M?

(A) B (B) R (C) J (D) M

20. Who is second to the left of T?

(A) F (B) M (C) P (D) J

21. In a joint family, there are father, mother, 4 married sons and three unmarried daughters. Of the sons, two have 2 daughters each, and two have a son and a daughter each. How many female members are there in the family?

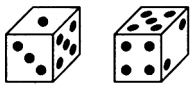
(A) 15 (B) 12 (C) 14 (D) 11

22. In a class of 35 students, Kunal is placed seventh from the bottom whereas Sonali is placed ninth from the top. Pulkit is placed exactlyin between the two. What is Kunal's position from Pulkit?

(A) 9 (B) 10 (C) 11 (D) 13

SPACE FOR ROUGH WORK

23. Two positions of a dice are shown. If two dots are on the bottom, then how many dots will be on the top ?



(A) 1 (B) 3

(C) 6 (D) 5

24. If today is Monday, what will be the day 350 days from now?

(A) Tuesday (B) Monday (C) Wednesday (D) Saturday

25. Choose the odd one out.

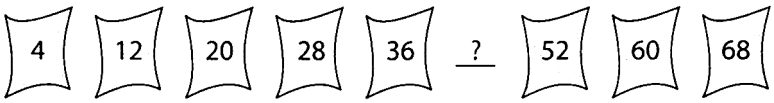
(A) VRT (B) RMP (C) YUW (D) FBD

26. Identify the rule followed in the number series given below

(A) Add 2 in previous term to get the next term (B) Multiply previous term by 2 to get the next term

(C) Subtract 2, 4, ... sequentially (D) Mulitply the number by itself to get the next term

27. Find the missing term in the given number series.



(A) 

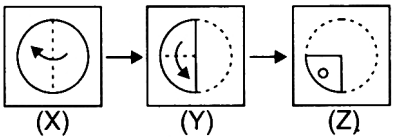
(B) 

(C) 

(D) 

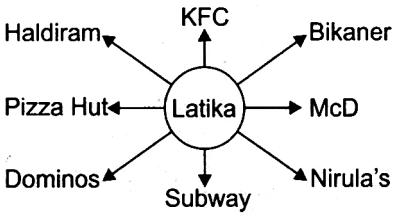
SPACE FOR ROUGH WORK

28. A set of three figures X, Y and Z showing a sequence of folding of a piece of paper is given. Fig. (Z) shows the manner in which the folded paper has been cut. Select the option which shows the unfolded form of Fig.(Z)



(A)  (B)  (C)  (D) 

29. Latika is facing Bikaner. What will she be facing, if she turns 315° anti-clockwise?



(A) McD (B) KFC (C) Subway (D) Nirula's

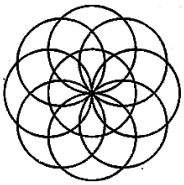
30. How many circles are there in the given below?

(A) 9

(B) 10

(C) 11

(D) 12



31. The average weight of 10 oarsmen in a boat is increased by 1.8 kg when one of the crew member, whose weighs 53 kg is replaced bya new man. Find the weight of the new man

(A) 75 kg (B) 71 kg (C) 68 kg (D) 80 kg

SPACE FOR ROUGH WORK

32. The average temperature of the town in the first four days of a month was 58 degrees. The average for the second, third, fourth and fifth day was 60 degrees. If the temperatures of the first and fifth day were in the ratio 7 : 8, then what is the temperature on the fifth day?

(A) 64 degrees (B) 62 degrees (C) 56 degrees (D) None of these

33. In an examination, a pupil's average marks were 63 per paper. If he had obtained 20 more marks for his Geography paper and 2 more marks for his History paper, his average per paper would have been 65. How many papers were there in the examination?

(A) 8 (B) 9 (C) 10 (D) 11

34. Tarun can cover a certain distance in 1 hr 24 min by covering $\frac{2}{3}$ of the distance at 4 km/hr and the rest at 5km/hr. The total distance is:

(A) 5 km (B) 6 km (C) 8 km (D) 9.2 km

35. Pallavi and Richa start Simultaneously from P and Q towards Q and P respectively. They meet on the way at T. Which is at a distance of 120 m from P. If Pallavi and Richa take 16 s and 25 s to reach their respective destinations from T, then what is the distance between P and Q.

(A) 214 m (B) 200 m (C) 240 m (D) 216 m

36. A car travels the first one-third of a certain distance with a speed of 10 km / hr, the next one-third distance with a speed of 20 km / hr, and the last one-third distance with a speed of 60 km / hr. The average speed of the car for the whole journey is :

(A) 18 km/hr (B) 24 km/hr (C) 30 km/hr (D) 36 km/hr

37. Robert is travelling on his cycle and has calculated to reach point A at 2 P.M. if he travels at 10 kmph. he will reach there at 12 noon if he travels at 15 kmph. At what speed must he travel to reach A at 1 P.M.

(A) 8 kmph (B) 11 kmph (C) 12 kmph (D) 14 kmph

SPACE FOR ROUGH WORK

38. A tyre has two punctures. The first puncture alone would have made the tyre flat in 9 minutes and the second alone would have done it in 6 minutes. If air leaks out at a constant rate, how long does it take both the punc-tures together to make it flat ?

(A) $1\frac{1}{2}$ minutes (B) $3\frac{1}{2}$ minutes (C) $3\frac{3}{5}$ minutes (D) $4\frac{1}{4}$ minutes

39. A and B together can do a piece of work in 12 days, which B and C together can do in 16 days. After A has been working at it for 5 days and B for 7 days. C finishes it in 13 days. In how many days C alone do the work ?

(A) 16 days (B) 24 days (C) 36 days (D) 48 days

40. Two pipes A and B together can fill a cistern in 4 hours. Had they been opened separately, then B would have taken 6 hours more then A to fill the cistern. How much time will be taken by A to fill the cistern separately ?

(A) 1 hour (B) 2 hour (C) 6 hour (D) 8 hour

41. Which is the smallest six-digit number divisible by 111?

(A) 111111 (B) 110011 (C) 100011 (D) 100111

42. Let $N = 1421 \times 1423 \times 1425$. What is the remainder when N is divided by 12?

(A) 0 (B) 9 (C) 3 (D) 6

43. What is the remainder when $74^{13} - 41^{13} + 75^{13} - 42^{13}$ is divided by 66?

(A) 2 (B) 64 (C) 1 (D) 0

SPACE FOR ROUGH WORK

44. The price of sugar is increased by 20%. The expenditure of the family on sugar will be decreased by:

(A) 10% (B) 5% (C) 14% (D) 15%

45. 8% of the people eligible to vote are between 18 and 21 years of age. In an election, 85% of those eligible to vote, who were between 18 and 21, actually voted. In that election, the number of persons between 18 and 21, who actually voted, was what percent of those eligible to vote?

(A) 4.2 (B) 6.4 (C) 6.8 (D) 8.0

46. A and B started a business jointly. A's investment was thrice the investment of B and the period of his investment was two times the period of investment of B. If B received Rs. 4000 as profit, then their total profit is:

(A) Rs. 16,000 (B) Rs. 20,000 (C) Rs. 24,000 (D) Rs. 28,000

47. A and B started a business with initial investments in the ratio 14 : 15 and their annual profits were in the ratio 7 : 6. If A invested the money for 10 months, for how many months did B invest his money?

(A) 6 (B) 7 (C) 8 (D) 9

48. A shopkeeper sells a badminton racket, whose marked price is Rs. 30, at a discount of 15% and gives a shuttle cock costing Rs. 1.50 free with each racket. Even then makes a profit of 20%. His cost price per racket is:

(A) Rs. 19.75 (B) Rs.20 (C) Rs. 21 (D) Rs. 21.25

49. The price of an article is raised by 30% and then two successive discounts of 10% each are allowed. Ultimately, the price of the article is:

(A) decreased by 5.3% (B) increased by 3%

(C) increased by 5.3% (D) increased by 10%

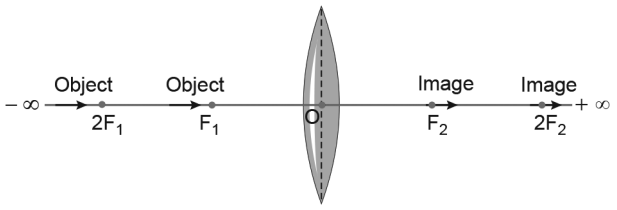
SPACE FOR ROUGH WORK

50. A man sells 2 cows for Rs. 4,000 each, neither gaining nor losing in the deal. If he sold one cow at a gain of 25%, then the other cow is sold at a loss of:

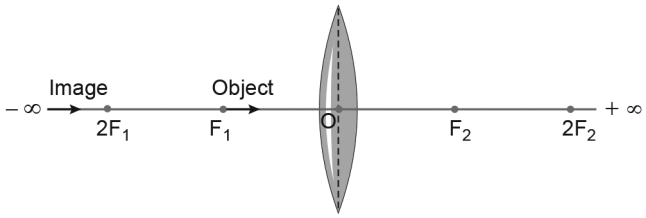
(A) 16.66% (B) 18.22% (C) 25% (D) 30%

Read the following and answer questions from 51 to 55.

The image formed by a convex lens depends on the position of the object in front of the lens. When the object is placed anywhere between focus and infinity, the image formed by convex lens is real and inverted. The image is not obtained on the screen when the object is placed between focus and the lens. The distance between the optical centre O of the convex lens and the focus point F_1 or F_2 is its focal length. When the object shifts from $-\infty$ to F_1, the image moves from F_2 to $+\infty$.



When the object shifts from F_1 to O, the image moves from $-\infty$ to O.



SPACE FOR ROUGH WORK

A student did an experiment with a convex lens. He put an object at different distances from the lens. In each case he measured the distance of the image from the lens. The results were recorded in the following table.

Object distance (in cm)	25	30	40	60	120
Image distance (in cm)	100	24	60	30	40

Unfortunately his results are written in the wrong order.

51. The focal length of this lens is

(A) 20 cm (B) 25 cm (C) 30 cm (D) 35 cm

52. The image distances in the correct order (in cm) is

(A) 24, 30, 40, 60, 100 (B) 100, 24, 60, 40, 30

(C) 100, 60, 30, 40, 24 (D) 100, 60, 40, 30, 24

53. Which of this object distances gives the biggest image?

(A) 30 cm (B) 25 cm (C) 40 cm (D) 60 cm

54. The minimum distance between an object and its real image formed by a convex lens is

(A) 2f (B) 3f (C) 4f (D) zero

55. A virtual image is formed by convex lens when object is placed

(A) at infinity (B) between C and F (C) at F (D) between F and O

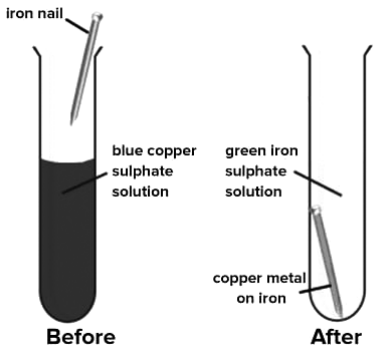
SPACE FOR ROUGH WORK

56. Antiseptics are applied by medical staff to decontaminate the skin of the hands, pre-operatively clean the skin of the surgical site, and cleanse chronic and acute wounds.

Which one of the following is applied on wounds as an antiseptic?

(A) Sodium (B) Iodine (C) Brass (D) All of these

57. Iron being more reactive than copper will displace copper from its salt and form a subsequent salt of ferrous sulphate. During the reaction, the colour of copper sulphate [blue] will change to greenish-blue



What is the chemical formula of copper sulphate?

(A) $CuSO_4$ (B) $CuSO_3$ (C) Cu_2SO (D) $Cu(SO_4)_2$

SPACE FOR ROUGH WORK

58. Its rot-resistant nature makes it an excellent wood for building Srinagar, Kashmir's well-known houseboats.

Long, long ago, which of the following trees was used to produce matchsticks?

(A) Mango (B) Deodar (C) Banyan (D) Pine

59. A fire extinguisher is an active fire protection device used to extinguish or control small fires, often in emergency situations.

Baking soda constitutes

(A) hydrogen chloride (B) sodium oxide

(C) sodium bicarbonate (D) oxygen

SPACE FOR ROUGH WORK

60. Air pollution is the contamination of air due to the presence of substances in the atmosphere that are harmful to the health of humans and other living beings, or cause damage to the climate or to materials.

Which gas is the major pollutant of air?

(A) Carbon monoxide
(B) Nitrogen
(C) Carbon dioxide
(D) Propane

SPACE FOR ROUGH WORK

PART – II (Science)

(Single Correct Type)

61. A body is said to be in motion if:

(A) Its position with respect to surrounding objects remains same

(B) Its position with respect to surrounding objects keep on changing

(C) Both (A) and (B)

(D) Neither (A) nor (B)

62. The brakes applied to a car produce a negative acceleration of 6 ms^{-2}. If the car stops after 2 seconds, the initial velocity of the car is:

(A) 6 ms^{-1} (B) 12 ms^{-1} (C) 24 ms^{-1} (D) Zero

63. A person is listening to a tone of 500 Hz sitting at a distance of 450 m from the source of the sound. What is the time interval between the successive compression from the source?

(A) 5 ms (B) 1 ms (C) 2 ms (D) 2 s

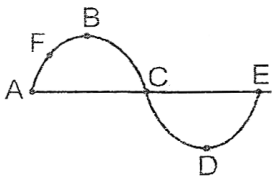
64. In the given figure, displacement of medium particle has been shown at different position at a particular instant of time:

(A) The speed of particle B and D are same

(B) The speed of particle A, B, E are maximum

(C) The particle F has zero speed

(D) All particles have same speed



SPACE FOR ROUGH WORK

65. The speeds of sound air and sea-water are given to be 340 m/s and 1440 m/s respectively. A ship sends a strong signal straight down and detects its echo after 1.5 secs. The depth of sea at that point is:

(A) 2.16 kms (B) 1.08 kms (C) 0.51 kms (D) 0.255 kms

66. A thin lens and a spherical mirror have a focal length of +15cm each.

(A) Both are convex (B) The lens is convex and the mirror is concave

(C) The lens is concave and the mirror is convex (D) Both are concave

67. Which of the following is natural fibre obtained from plants?

(A) Cotton (B) Wool (C) Rayon (D) Ketone

68. Isotopes have different number of:

(A) Proton (B) Electron (C) Neutron (D) All of these

69. An atom with 3 protons and 4 neutrons will have a valency of:

(A) 3 (B) 1 (C) 2 (D) 4

70. Maximum number of electrons that can be accomodated in d-sub shell :

(A) 2 (B) 10 (C) 14 (D) 6

71. ____is produced when charcoal is burnt in insufficient supply of air?

(A) Carbon di oxide (B) Nitrogen dioxide (C) Carbon monoxide (D) None of these

72. How many zones are there in the flame?

(A) One (B) Three (C) Two (D) Four

73. Which of the following is obtained from coal tar?

(A) Petrol (B) Coke (C) Air (D) Naphthalene Balls

SPACE FOR ROUGH WORK

74. $^{40}_{18}Ar$ and $^{40}_{20}Ca$ are:

(A) Isotopes (B) Isobars (C) Isotones (D) Both B and C

75. Practice of leaving the field uncultivated for a season is called

(A) Field fallow (B) Crop rotation (C) Multiple cropping (D) Intercropping

76. Which of the follwoing is/are example of biofertilizers

(A) *Rhizobium* (B) *Nostoc* (C) *E.coli* (D) Both (A) & (B)

77. Which of the following is/are weeds

(A) *Parthenium* (B) *Amaranthus* (C) Both (A) & (B) (D) None of these

78. Viruses are small infective particles which are primarily made up of :

(A) Nucleic acids and polysaccharides (B) Lipids and proteins

(C) Nucleic acids and lipids (D) Nucleic acids and proteins

79. The energy currency of a cell is

(A) ADP (B) AMP (C) ATP (D) CTP

80. The cell organelle associated with cell secretion is

(A) Plastids (B) Mitochondria (C) Golgi apparatus (D) Nucleolus

81. The function of the nucleolus in the cell is

(A) Secretory (B) Synthesis of DNA

(C) Synthesis of RNA and ribosomes (D) None of these

SPACE FOR ROUGH WORK

82. Ribosomes are composed of –

(A) 1 subunit (B) 5 subunits (C) 2 subunits (D) 4 subunits

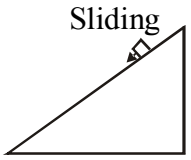
83. The main reproductive organ of human male is _____.

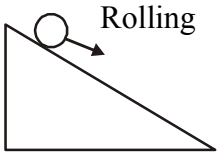
(A) A pair of testes (B) Vas deferens (C) Urethra (D) Penis

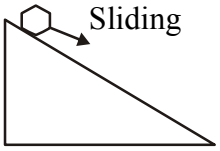
84. The bright colours of ripe fruits are due to –

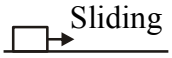
(A) Leucoplast (B) Chloroplast (C) Amyloplast (D) Chromoplast

85. In which of the following situations , the frictional force is least ?

(A) 

(B) 

(C) 

(D) 

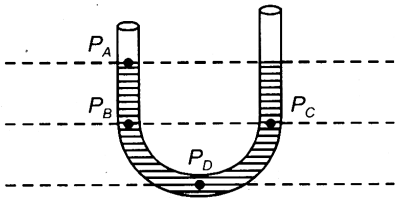
86. Water is filled in a U tube as shown below . P_A ,P_B ,P_C and P_D are the pressures at different horizontal levels , then

(A) $P_A = P_B = P_C = P_D$

(B) $P_A = P_B = P_D$

(D) $P_C = P_D$

(D) $P_B = P_C$



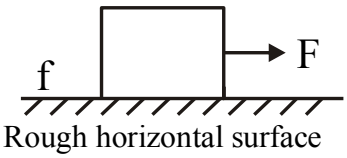
87. Water reservoirs are made thicker at the bottom rather than that at top , because

(A) Pressure is greater at the bottom (B) Water is less denser at the bottom

(C) Water is less heavy at the bottom (D) Pressure is lesser at the bottom

SPACE FOR ROUGH WORK

88. In the figure given ,if net force acting on body is zero then which of the following conditions is not possible? [F is applied force and f is frictional force acting on the body]



(A) If the body is at rest then it will remain at rest

(B) $F_{(applied)} = f_{(friction)}$

(C) If the body is moving with uniform speed then it will move with same speed

(D) The speed of the body may be increasing or decreasing

89. Electrolysis of water is

(A) Physical change (B) Chemical change (C) Both 1 and 2 (D) None of these

90. The formation of clouds, mist and fog are the examples of .

(A) Chemical combination of O_2 and H_2O

(B) Physical change which involves condensation of water vapour

(C) Physical change which involves sublimation

(D) Chemical change which involves absorption of huge amount of energy

91. A few elements in the order of decreasing reactivity are: K > Ca > Mg > Fe > Sn > H > Au. Identify the incorrect statement.

(A) Au is the weakest reducing agent

(B) Tin from tin oxide can be displaced by Fe

(C) Ca displaces hydrogen from water more easily than Fe

(D) K is the strongest oxidising agent

SPACE FOR ROUGH WORK

92. Gaps are left between railway tracks because :

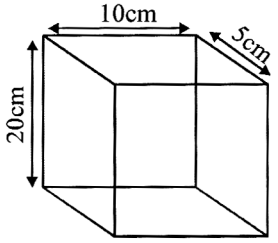
(A) Gaps give the space to the tracks to expand in summer heat

(B) Gaps hold the tracks firmly

(C) To produce gentle rhythemic sound when the train moves on the track

(D) It is customary to leave the gaps

93. A brick of weight 80 N stands upright on the ground as shown in the figure. The pressure exerted on the ground by brick is



(A) $\frac{5\times10}{80}\times10^{-4}\,Nm^{-2}$ (B) $80\times5\times10^{-4}\,Nm^{-2}$

(C) $\frac{10}{80\times5\times10^{-4}}\,Nm^{-2}$ (D) $\frac{80}{10\times5\times10^{-4}}\,Nm^{-2}$

94. The forces of action and reaction are

(A) Always equal only (B) Always equal and opposite

(C) Always equal but in same direction (D) Always unequal and opposite

95. Which of these elements is used as an antiseptic in medicine?

(A) Carbon (B) Oxygen (C) Nitrogen (D) Iodine

96. Match the following:

Column-I	**Column -II**
(P) Raincoats	(1) Styrofoam
(Q) Plugs and switches	(2) Bakelite
(R) Bags for storage	(3) Polythene
(S) Thermocol	(4) PVC

(A) (P)-(4), (Q)-(2), (R)-(3), (S)-(1) (B) (P)-(4), (Q)-(3), (R)-(2), (S)-(1)

(C) (P)-(1), (Q)-(2), (R)-(3),(S)-(4) (D) (P)-(4), (Q)-(2), (R)-(1), (S)-(3)

SPACE FOR ROUGH WORK

97. Calcination is the process of heating the ore

(A) In a blast furnace (B) In absence of air

(C) In presence of air (D) None of these

98. The force of friction between two bodies is

(A) Parallel to the contact surface (B) Perpendicular to the contact surface

(C) Inclined at 30° to the contact surface (D) Inclined at 60° to the contact surface

99. The mass and speed of four bodies are:

Body	Mass	Speed
a	1 kg	10 m/s
b	2 kg	9 m/s
c	3 kg	8 m/s
d	4 kg	7 m/s

The body with the largest magnitude of momentum is

(A) a (B) b (C) c (D) d

100. On moving from left to right the size of the atom

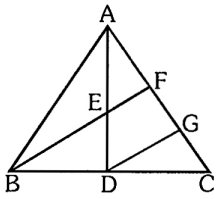
(A) Increases (B) Decreases (C) Remains same (D) None of the above

SPACE FOR ROUGH WORK

PART – III (Mathematics)

Single Correct Type)

101. In ΔABC, a median AD is drawn from A and E is the mid point of AD. On producing BE, it cuts AC at F and DG is parallel to EF and DG cuts AC at G. If AC = 4.5 cm, then the length of AF is equal to :



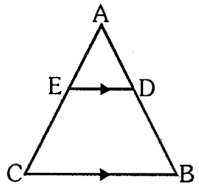
(A) 2.2 cm

(B) 1.5 cm

(C) 4.5 cm

(D) None of these

102. In ΔABC, $DE \| BC$, and DE intersects AB and AC at D and E respectively. If AD = 4 cm, DB = 6 cm and EC = 8 cm. Then what is the length AE?



(A) $\frac{16}{3}$ cm (B) $\frac{17}{3}$ cm

(C) $\frac{14}{3}$ cm (D) None of these

103. The value of x, if $5^{x-3} \cdot 3^{2x-8} = 225$, is :

(A) 1 (B) 2 (C) 3 (D) 5

SPACE FOR ROUGH WORK

104. $\frac{3^{5X} \times (81)^2 \times 6561}{3^{2X}} = 3^7$, then

(A) $X = -2$ (B) $X = -3$ (C) $X = -1$ (D) $X = 0$

105. $3^n \times 9^n \times 27^{1-n} =$

(A) 9 (B) 27 (C) 3 (D) $\frac{1}{3}$

106. If $2^x = 4^y = 8^x$, then find x : y : z.

(A) 1 : 2 : 3 (B) 3 : 2 : 1 (C) 2 : 3 : 1 (D) 6 : 3 : 2

107. If $\frac{p}{q} = \left(\frac{2}{3}\right)^3 \div \left(\frac{3}{2}\right)^{-3}$ then the value of $\left(\frac{p}{q}\right)^{-10}$ is :

(A) 1 (B) 0

(C) Cannot be determined (D) None of these

108. The graph of the equation $5x-3y = 10$ cuts the x-axis at the point

(A) $\left(0, \frac{-10}{3}\right)$ (B) $(-2,0)$ (C) $(2,0)$ (D) $(0,0)$

109. If the diagonal of a square is $12\sqrt{2}$ cm . Then the area of this square will be

(A) 64 (B) 141 (C) 121 (D) 144

SPACE FOR ROUGH WORK

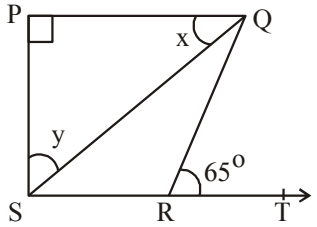
110. If the area of three adjacent faces of a cuboid are x, y, z respectively, then the volume of a cuboid is ....

(A) $x+y+z$ (B) x^2yz (C) $\sqrt{xyz}$ (D) $xy+z$

111. If $x+\frac{1}{x}=4$, then $x^4+\frac{1}{x^4}=$

(A) 196 (B) 194 (C) 192 (D) 190

112. In the given figure if PQ $\perp$ PS, PQ $\|$ SR, $\angle SQR = 28^o$ and $\angle QRT = 65^o$, then find the value of (x+y)



(A) 37^o

(B) 53^o

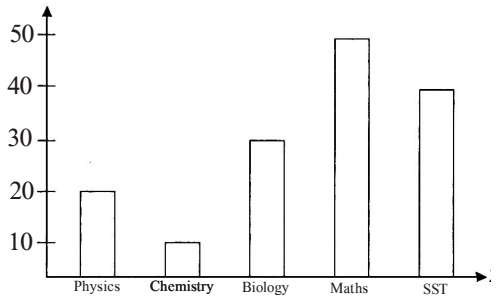
(C) 90^o

(D) 47^o

113. A certain number of men went to a hotel. Each men spent as many rupees as one-fourth of the men. If the total bill paid was Rs. 20,449, then how many men visited the hotel ?

(A) 222 (B) 246 (C) 264 (D) 286

114. A bar graph represent the subjective marks of a student in different subjects.



On x-axis subject, On y-axis marks

Find the percentage increase in the marks of mathematics with respect to the marks of the chemistry.

(A) 200 % (B) 300 % (C) 400 % (D) 500 %

SPACE FOR ROUGH WORK

115. If thrice of A's age 6 years ago be subtracted from twice his present age, the result would be equal to his present age. Find A's present age.

(A) 9 (B) 10 (C) 11 (D) 12

116. Three numbers are in the ratio 2 : 3 : 4. The sum of their cubes is 33957. Find the difference between largest and smallest number.

(A) 14 (B) 5 (C) 7 (D) 11

117. If x = a, y = b is the solution of the equation x - y = 2 and x + y = 4, then the values of a and b are, respectively

(A) 3 and 5 (B) 5 and 3 (C) 3 and 1 (D) – 1 and – 3

118. If 'a' is six times as large as 'b' then by what percent 'b' is less than 'a' ?

(A) $16\frac{2}{3}\%$ (B) 60% (C) $83\frac{1}{3}\%$ (D) 90 %

119. If $x + \sqrt{15} = 4$ then $x + \frac{1}{x} = ?$

(A) 2 (B) 4 (C) 8 (D) 1

120. The number of revolutions a wheel of diameter 40 cm makes in traveling a distance of 176 m is equal to

(A) 140 (B) 150 (C) 160 (D) 1666

❑ ❑ ❑

SPACE FOR ROUGH WORK

ANSWER KEY

Code A

Course 2

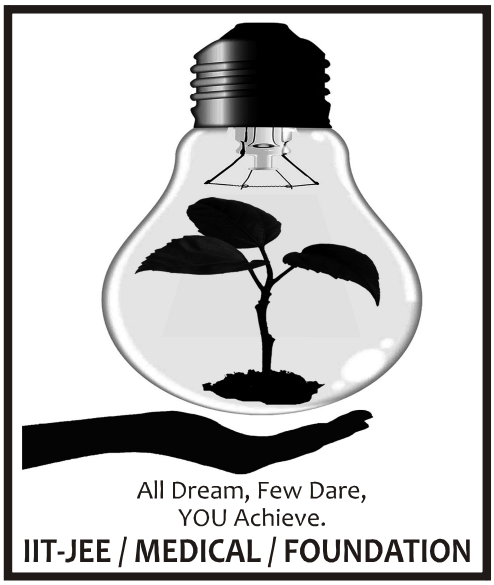
Class 8 going to Class 9 Students

PART - I						PART - II						PART - III	
01.	B	21.	C	41.	C	61.	B	81.	C	101.	A
02.	A	22.	B	42.	C	62.	B	82.	C	102.	A
03.	D	23.	B	43.	D	63.	C	83.	A	103.	D
04.	C	24.	B	44.	A	64.	A	84.	D	104.	B
05.	D	25.	B	45.	C	65.	B	85.	B	105.	B
06.	C	26.	B	46.	D	66.	A	86.	D	106.	B
07.	B	27.	A	47.	C	67.	A	87.	A	107.	A
08.	B	28.	C	48.	B	68.	C	88.	D	108.	C
09.	C	29.	A	49.	C	69.	B	89.	B	109.	D
10.	C	30.	A	50.	A	70.	B	90.	B	110.	C
11.	B	31.	B	51.	A	71.	C	91.	D	111.	B
12.	D	32.	A	52.	D	72.	B	92.	A	112.	C
13.	C	33.	D	53.	B	73.	D	93.	D	113.	D
14.	C	34.	B	54.	C	74.	B	94.	B	114.	C
15.	A	35.	D	55.	D	75.	A	95.	D	115.	A
16.	B	36.	A	56.	B	76.	D	96.	A	116.	A
17.	D	37.	C	57.	A	77.	C	97.	B	117.	C
18.	A	38.	C	58.	D	78.	D	98.	A	118.	C
19.	B	39.	B	59.	C	79.	C	99.	D	119.	C
20.	D	40.	C	60.	A	80.	C	100.	B	120.	A

ADMISSION TEST

Code A

Brother's Academy



Course 3

Class 9 going to Class 10 Students

Read the following Instructions very carefully before you proceed

SAMPLE COPY

- The paper is divided into **THREE PARTS**. PART - I contains 60 question of **Scientific Aptitude.**
  PART - II contains 45 question of **Science**.
  Part - III contains 15 question of **Mathematics**.
- It contains a total of **120 questions** and **28 printed pages.**
- For answering a question, an ANSWER SHEET is provided separately. Please fill your Reg. No. and Paper set Properly in the space given in the ANSWER SHEET.
- Please darken the entire circle that corresponds to your answer for each question. Use only HB pencil or Ball Point Pen to mark answer, and erase pencil marks completely to make a change. Do not scribble anything on the answer sheet.

Wrong way of filling

A B C D A B C D

Right way of filling

A B C D

- **Full Marks 360. Total Time $2\frac{1}{2}$ Hrs**.
- Marking Scheme : ONLY ONE correct option and each question carries **3** Marks and **–1** will be awarded for every wrong answer. **(NEGATIVE MARKING).**

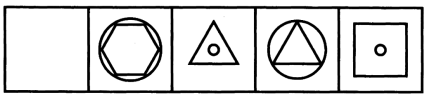
Name : _____ Reg. No. : _____

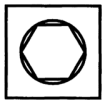
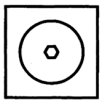
PART – I (Scientific Aptitude)

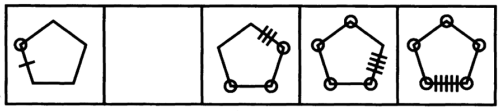
Single Correct Type)

Direction (Questions 01 to 05):

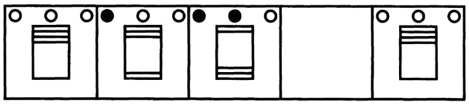
To the left there are four squares arranged in order. One of these squares has been left empty. One of the four squares on the right should take the place of the empty square.

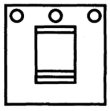
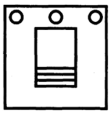
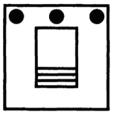
01. 

(A)  (B)  (C)  (D) 

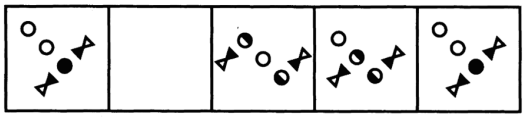
02. 

(A)  (B)  (C)  (D) 

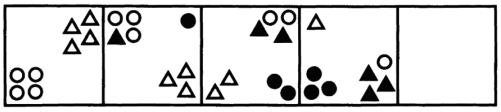
03. 

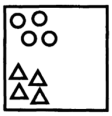
(A)  (B)  (C)  (D) 

SPACE FOR ROUGH WORK

04. 

(A)  (B)  (C)  (D) 

05. 

(A)  (B)  (C)  (D) 

06. Which of the following options will complete the given series?

1, 6, 15, (...?), 45, 66, 91

(A) 25 (B) 26 (C) 27 (D) 28

07. How many pairs of letters are there in the word PHILOSOPHICAL which have as many letters between them as in the English alphabet?

(A) Nine (B) Four (C) Seven (D) Six

08. Harsh starts walking straight facing south. After 15 meters he turned to his right, walked 10 metres and turned to his left. Again after walking a distance of 5 meters he turned to his left. Which direction is he facing now?

(A) West (B) East (C) North-East (D) South-West

SPACE FOR ROUGH WORK

09. Study the set of numbers given below and answer the question which follow:

427 581 839 275 589

If two is subtracted from the first digit of each of the numbers and then the first and the third digits are interchanged, which of the following will be the lowest?

(A) 427 (B) 581 (C) 839 (D) 275

10. Pointing to Kartik, Vivan said, "His mother's brother is the fatherof my son Nitin."How is Kartik related to Vivan?

(A) Uncle (B) Brother (C) Nephew (D) Father

11. If it is possible to make a meaningful word from the first, fourth, seventh; and ninth letters of the word FABRICATION using each letter only once, third letter of the word would be your answer. If more than one such word can be formed, your answer would be 'S' and if no such word can be formed, answer is M.

(A) I (B) F (C) M (D) S

12. How many such symbols are there in the given arrangement, each of which is immediately preceded by a consonant and also immediately followed by a consonant?

*3P1 %TRA5#DM7K*EG28$H

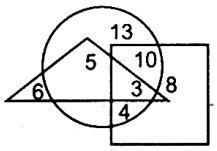
(A) None (B) One (C) Two (D) Three

13. In a certain code language LANGOUR is written as RZMTLFL and CERTAIN is wrtten as NVIGZRC. How will ALPHABET be written in that code language?

(A) TLPHABEA (B) TOKSAYVA (C) TOKSAZYA (D) TOKSZYVA

SPACE FOR ROUGH WORK

14. In the given diagram, square represents women, triangle represents sub-inspectors of police and circle represents graduates. Which numbered area represents graduate women who are sub-inspectors of police?



(A) 5

(B) 3

(C) 8

(D) 13

15. Find the missing number, if a certain rule is followed row-wlise or column-wise.

6	6	8
5	7	5
4	3	?
120	126	320

(A) 4

(B) 8

(C) 12

(D) 16

16. If 'x' denote '–', '+'denotes '÷', '–' denotes '+' and '÷' denoted '×' then what is the value of $136 + 4 \div 5 - 68 \times 75$

(A) 165 (B) 146 (C) 173 (D) 163

17. Which would be the proper order of the following (in ascending order)?

1. Trillion 2. Thousand 3. Billion 4. Hundred 5. Million

(A) 1,2,4,3,5 (B) 1,5,3,2,4 (C) 4,2,3,5,1 (D) 4,2,5,3,1

SPACE FOR ROUGH WORK

18. In the given question, a group of letters is followed by four combinations of digits/ symbols. You have to find out which of the combinations correctly represents the group of letters based on the following coding system and the conditions and select the correct option of that combination.

Letter	R	A	T	K	F	Q	E	P	J	I	M	U	D	H
Digit/ Symbol	3	@	2	1	9	4	©	%	5	8	$	6	7	#

Conditions :

(i) If the first letter is a consonant and the last letter is a vowel, their codes are to be interchanged.

(ii) If both the first and the last letters are vowels, both are to be coded as H.

(iii) If both the first and the last letters are consonants, both are to be coded as the code for the last letter.
UDKFME

(A) #719$© (B) 6719$© (C) #719$# (D) ©719$6

19. Study the following information carefully and answer the following question,

(i) A, B, C, D, E, F, G, and H are eight students, each having a different height.

(ii) D is shorter than A but taller than G.

(iii) E is taller than H but shorter than C.

(iv) B is shorter than D but taller than F.

(v) C is shorter than G.

(vi) G is not as tall as F.

Which of the following statements is definitely INCORRECT?

(A) G is shorter than F (B) C is shorter than F (C) F is taller than C (D) None of these

SPACE FOR ROUGH WORK

20. Which of the following is third to the left of the eighteenth digit from the left end of the given arrangement ?

7 6 1 7 9 2 4 1 5 6 4 9 2 3 4 1 5 8 4 8 1 2 7

(A) 8 (B) 3 (C) 4 (D) 5

21. Mohit is 16th from the top and twelfth from the bottom in merit in the class. How many students are there in the class?

(A) 29 (B) 28 (C) 27 (D) None of these

22. Read the following information and answer the following question.

(i) L, M, N, O, P, Q, R and S are sitting around a circle facing the centre.

(ii) N, who is third to the left of P, is not a neighbour of R and M.

(iii) S is the neighbour of O and R and is third to the right of M.

(iv) L is not the neighbour of O, who is second to the left of N.

What is the position of Q ?

(A) Immediate right of R (B) Immediate left of N

(C) Third to the right of M (D) Second to the left of S

23. Arrange the given words as they occur in the dictionary and then select the correct option. .

1. Dissipate 2. Dissuade 3. Disseminate 4. Distract

5. Dissociate 6. Dissect

(A) 6,3,1,5,2,4 (B) 1,6,3,2,4,5 (C) 3,6,1,2,5,4 (D) 4,6,3,1,5,2

SPACE FOR ROUGH WORK

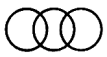
24. Select the combination of numbers so that lie letters are arranged accordingly to form a meaningful word.

H B M R S U O

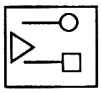
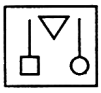
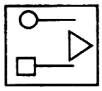
1 2 3 4 5 6 7

(A) 3, 4, 2, 7, 6; 1, 5 (B) 5,2,7,1,4,6,3 (C) 4,1,7, 3, 2, 6, 5 (D) 4,1,7,3,2,5,6

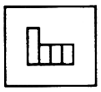
25. Which of the following Venn diagrams best represents the relationship amongst "Aeroplane, Pilot, Air hostess"?

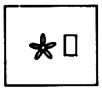
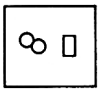
(A)  (B)  (C)  (D) 

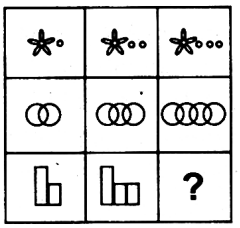
26. Select the odd one out.

(A)  (B)  (C)  (D) 

27. Which of the following options will replace the question mark (?) to complete the given figure matrix?

(A)  (B) 

(C)  (D) 



28. Fig. (X) given on the left hand side is folded along the lines to form a cube. Choose the boxes from the options which may be formed on closing the cube.

(A) 2 and 3

(B) 3 and 4

(C) 2 and 4

(D) 1 and 4

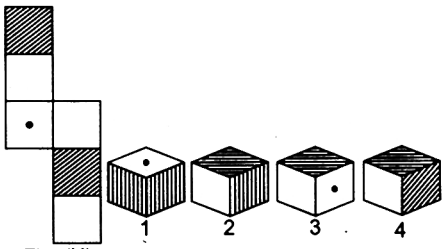
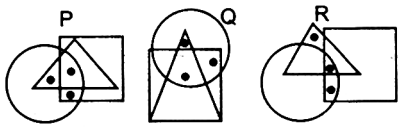


Fig. (X)

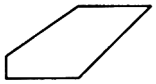
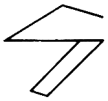
SPACE FOR ROUGH WORK

29. Select the pair which satisfies the same conditions of placement of dots



(A) PQ (B) QR (C) PR (D) None of these

30. Select the figure from the options which is NOT exactly embedded in the given Fig. (X)

(A) 
(B) 
(C) 
(D) 

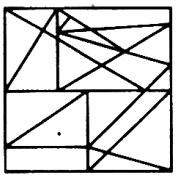
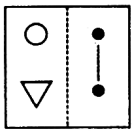
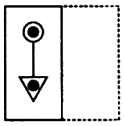
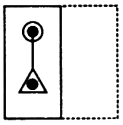
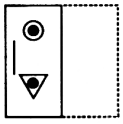
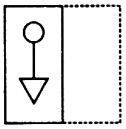


Fig. (X)

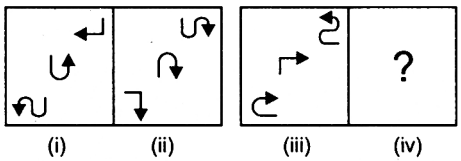
31. A square transparent sheet with a pattern and a dotted line on it is given. Find how the pattern would appear when the transparent Transparent sheet sheet is folded along the dotted line.

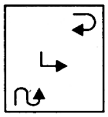
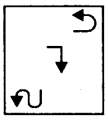
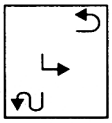
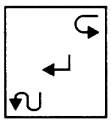


(A) 
(B) 
(C) 
(D) 

SPACE FOR ROUGH WORK

32. There is a certain relationship between figures (i) and (ii). Establish a similar relationship between figures (iii) and (iv) by selecting a suitable figure from the options that will-replace (?) in figure (iv).



(A)  (B)  (C)  (D) 

33. Select the pair from the given options that has a relationship similar to that in the Fig. (X).

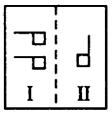
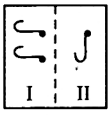
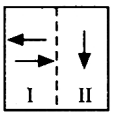
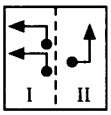
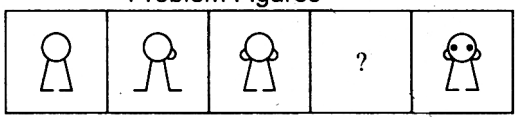


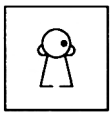
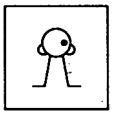
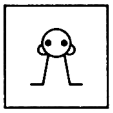
Fig. (X)

(A)  (B)  (C)  (D) 

34. Select a figure from the option figures, which will continue the series established by the Problem Figures

Problem Figures



(A)  (B)  (C)  (D) 

SPACE FOR ROUGH WORK

35. Which of the following is the correct mirror image of Fig. (X), if the mirror is placed vertically to the left?

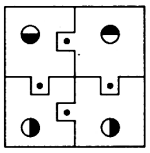
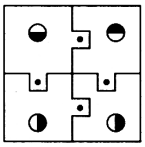
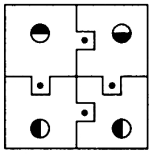
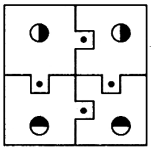
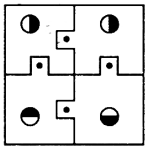


Fig. (X)

(A)  (B)  (C)  (D) 

36. There are 10 digits from 0 to 9 in the decimal system. How many 5-digit numbers can be formed, such that no two digits are the same

(A) 12216 (B) 26127 (C) 62716 (D) 27216

37. How many even numbers less than 1000 can be formed by uding the digits 2,4,3 and 5 if life repetition of the digits is allowed ?

(A) 42 (B) 40 (C) 44 (D) 38

38. The average age of a husband and his wife was 23 years at the time of their marriage. After five years they have a one - year old child. The average age of the family now is

(A) 19 years (B) 23 years (C) 28.5 years (D) 29.3 years

39. 16 children are to be divided into two groups A and B of 10 and 6 children. The average percent marks obtained by the children of group A is 75 and the average percent marks of all the 16 children is 76. What is the average percent marks of children of group B ?

(A) $77\frac{1}{3}$ (B) $77\frac{2}{3}$ (C) $78\frac{1}{3}$ (D) $78\frac{2}{3}$

SPACE FOR ROUGH WORK

40. Robert is travelling on his cycle and has calculated to reach point A at 2 P.M. if he travels at 10 kmph. he will reach there at 12 noon if he travels at 15 kmph. At what speed must he travel to reach A at 1 P.M.

(A) 8 kmph (B) 11 kmph (C) 12 kmph (D) 14 kmph

41. A, B and C can do a Job in 11,20 and 55 days respectively. How soon can the work be done if A is assisted by B and C on alternate days ?

(A) 7 days (B) 9 days (C) 8 days (D) 10 days

42. 24 men can complete a work in 16 days. 32 women can complete the same work in 24 days. 16 men and 16 women started working and worked for 12 days. How many more man are to be added to complete the remaining work in 2 days ?

(A) 16 (B) 24 (C) 36 (D) 48

43. If the product of three consecutive integers is 720, then their sum is:

(A) 54 (B) 45 (C) 27 (D) 36

44. A rich merchant had collected many gold coins. He did not want any body to know about him. One day, his wife asked, "How many gold coins do we have?" After pausing a moment he replied, "Well ! if divide the coins into two unequal numbers, then 48 times the difference between the two numbers equals the difference between the square of the two numbers. "The wife looked puzzled. Can you help the merchant's wife by finding out how many gold coins the merchant has?

(A) 96 (B) 53 (C) 43 (D) 48

45. A college has raised 75% of the amount it needs for a new building by receiving an average donation of Rs. 600 from the people already solicited. The people already solicited represent 60% of the people, the college will ask for donations. If the college is to raise exactly the amount needed for the new building, what should be the average donation from the remaining people to be solicited?

(A) 300 (B) 250 (C) 400 (D) 500

SPACE FOR ROUGH WORK

46. Mr. X, a businessman had the income in the year 2000, such that he earned a profit of 20% on his investment in the business. In the year 2001, his investment was less by Rs. 5000 but still had the same income (Income = Investment + Profit) as that in 2000. Thus, the percent profit earned in 2001 increased by 6%. What was his investment in 2000?

(A) Rs. 1,02,000 (B) Rs. 1.05,000 (C) Rs. 1,50,500 (D) None of these

47. The ages of a man and his son is in the ratio of 7 : 2. After 15 years. they would be in the ratio of 2 : 1, what was father's age when son was born?

(A) 25 years (B) 30 years (C) 35 years (D) 42 years

48. Manick received Rs. 6000 as his share out of the total profit of Rs. 9000 which he and Raunak earned at the end of one year. If Manick invested Rs. 20,000 for 6 months, whereas Raunak invested his amount for the whole year, what was the amount invested by Raunak?

(A) Rs. 4000 (B) Rs. 5000 (C) Rs. 6000 (D) Rs. 10,000

49. A shopkeeper sells a badminton racket, whose marked price is Rs. 30, at a discount of 15% and gives a shuttle cock costing Rs. 1.50 free with each racket. Even then makes a profit of 20%. His cost price per racket is:

(A) Rs. 19.75 (B) Rs.20 (C) Rs. 21 (D) Rs. 21.25

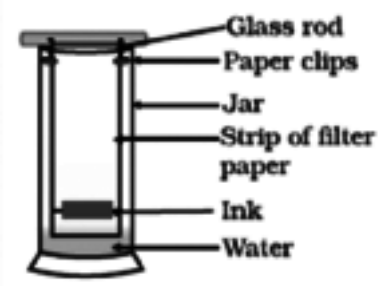
50. Two shopkeepers announce the same price of Rs. 700 for a sewing machine. The first offers successive discounts of 30% and 6% while the second offers successive discounts of 20% and 16%. The shopkeeper that offers better discount, charges ..... less than the other shopkeeper.

(A) Rs. 9.80 (B) Rs. 16.80 (C) Rs. 22.40 (D) Rs. 36.40

SPACE FOR ROUGH WORK

Read the following and answer questions from (51) to (52)

A child wanted to separate the mixture of dyes constituting a sample of ink. He marked a line by the ink on the filter paper and placed the filter paper in a glass containing water as shown in figure. The filter paper was removed when the water moved near the top of the filter paper



51. What would you expect to see, if the ink contains three different colored components?

(A) We will not see any band on the filter paper.

(B) We would see three bands on the filter paper at various lengths.

(C) We would see infinity bands on the filter paper.

(D) We would see single bands on the filter paper.

52. For the separation of what kind of substances is the above process used?

(A) For the separation of insoluble substances

(B) For the separation of single solute that dissolves in single solvent.

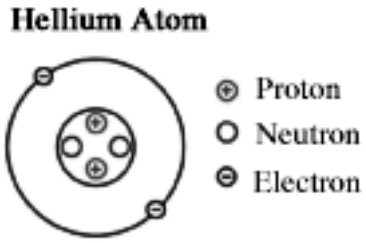
(C) For the separation of those solutes that dissolves in the same solvent.

(D) For the separation of those solutes that dissolves in the different solvents.

SPACE FOR ROUGH WORK

Read the following and answer questions from (53) to (55)

The chemical reaction equation indicates directly the number of atoms or molecules taking part in the reaction. Avogadro constant, NA, when expressed in the unit mol-1 and is called the Avogadro number. The amount of substance, symbol n, of a system is a measure of the number of specified elementary entities. An elementary entity may be an atom, a molecule, an ion, an electron, any other particle or a specified group of particles. The mass of 1 mole of a substance is equal to its relative atomic or molecular mass in grams. The atomic mass of an element gives us the mass of one atom of that element in atomic mass units (u).



53. The word 'mole' was introduced around 1896 by

(A) Wilhelm Ostwald (B) John Dalton

(C) Ernest Rutherford (D) J. J. Thomson

54. 1 g of Hydrogen have

(A) 6.022×10^{23} molecules of hydrogen (B) 6.022×10^{23} atoms of hydrogen

(C) 6.022×10^{26} atoms of hydrogen (D) 7.0222×10^{24} atoms of hydrogen

SPACE FOR ROUGH WORK

55. Identify the correct statement

Statement 1 – Positively charged center in an atom called the nucleus.

Statement 2 – The electrons revolve around the nucleus in circular paths.

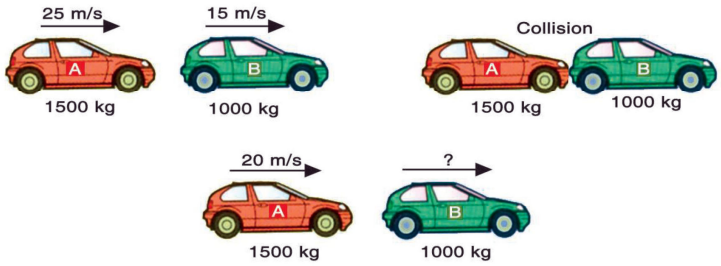
Statement 3 – Nearly all the mass of an atom resides in the nucleus.

Statement 4 – The size of the nucleus is very small as compared to the size of the atom.

(A) Only 2 (B) Both 3 & 4 (C) Both 1 & 2 (D) All of the above

Read the following and answer questions from (56) to (57)

The car A of mass 1500 kg, travelling at 25 m/s collides with another car B of mass 1000 kg travelling at 15 m/s in the same direction. After collision the velocity of car A becomes 20 m/s. Calculate the velocity of car B after the collision.



56. What is the momentum of the car A before collision?

(A) 30000 kg. m/s (B) 37500 kg. m/s (C) 15000 kg. m/s (D) 52500 kg. m/s

57. What is the total momentum of car A and car B before collision?

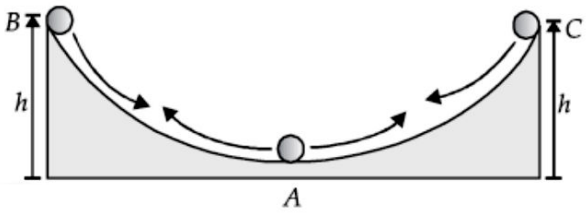
(A) 3750 kg. m/s (B) 37500 kg. m/s

(C) 15000 kg. m/s (D) 52500 kg. m/s

SPACE FOR ROUGH WORK

Read the following and answer questions from (58) to (60).

Figure shows a watch glass embedded in clay. A tiny spherical ball is placed at the edge B at a height h above the centre A.



58. The kinetic energy of ball, when it reaches at point A is

(A) zero (B) maximum (C) minimum (D) can't say.

59. The ball comes to rest because of

(A) frictional force (B) gravitational force

(C) both (A) and (B) (D) none of these.

60. The energy possessed by ball at point C is

(A) potential energy (B) kinetic energy

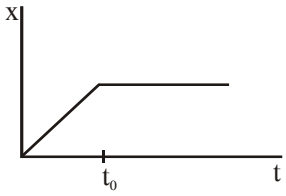
(C) both potential and kinetic energy (D) heat energy.

SPACE FOR ROUGH WORK

PART – II (Science)

Single Correct Type)

61. Figure shows the displacement-time graph of a particle moving on the X-axis.



(A) The particle is continuously going in positive x direction

(B) The particle is at rest

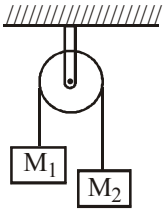
(C) The velocity increases up to a time t_0, and then becomes constant

(D) The particle moves at a constant velocity up to a time t_0, and then stops.

62. The negative of the work done by the conservative internal forces on a system equals the change in:

(A) Total energy (B) Kinetic energy (C) Potential energy (D) None of these.

63. Two masses M_1 = 5 kg and M_2 = 10 kg are connected at the ends of an inextensible string passing over a frictionless pulley as shown. When the masses are released, then the acceleration of the masses will be



(A) g (B) g/2 (C) g/3 (D) g/4

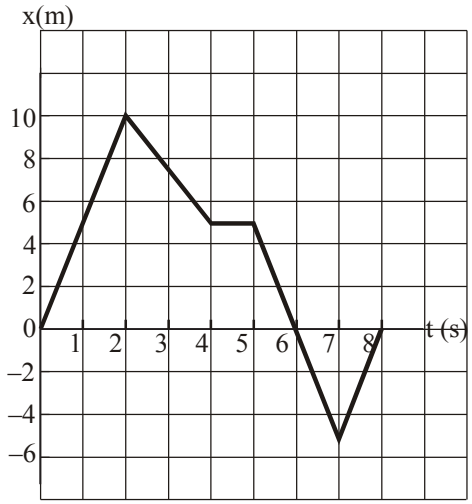
64. The work done by all the forces (external and internal) on a system equals the change in:

(A) Total energy (B) Kinetic energy (C) Potential energy (D) None of these.

SPACE FOR ROUGH WORK

For Q.65-Q.66

The position versus time for a certain particle moving along the x axis is shown in Figure.



65. Find the average velocity in the time intervals 0 to 2 s.

(A) 3 m/s (B) 4 m/s (C) 5 m/s (D) 2 m/s

66. Find the average velocity in the time intervals 0 to 4s.

(A) 1.2 m/s (B) 3.2 m/s (C) 4.2 m/s (D) 5.2 m/s

67. Mark the correct statements:

(A) The magnitude of the velocity of a particle is equal to its speed

(B) The magnitude of average velocity in an interval is equal to its average speed in that interval

(C) It is possible to have a situation in which the speed of a particle is always zero but the average speed is not zero

(D) It is possible to have a situation in which the speed of the particle is never zero but the average speed in an interval is zero.

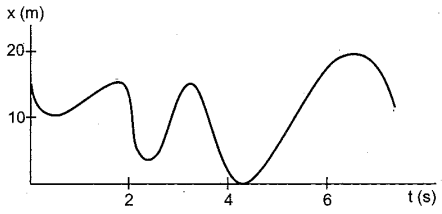
68. Figure shows the position of a particle moving on the X-axis as a function of time:

(A) The particle has come to rest 6 times

(B) The maximum speed is at t = 6 s

(C) The velocity remains positive for t = 0 to t = 6 s

(D) The average velocity for the total period shown is negative



SPACE FOR ROUGH WORK

69. A car accelerates on a horizontal road due to the force exerted by:

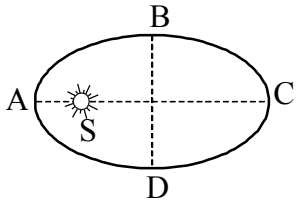
(A) The engine of the car (B) The driver of the car

(C) The earth (D) The road

70. The depth at which the effective value of acceleration due to gravity is g/4 is

(A) R (B) 3R/4 (C) R/2 (D) R/4

71. A planet is revolving around the sun as shown in elliptical path. The correct option is –



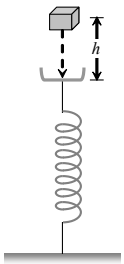
(A) The time taken in travelling DAB is less than that for BCD.

(B) The time taken in travelling DAB is greater than that for BCD.

(C) The time taken in travelling CDA is less than that for ABC.

(D) The time taken in travelling CDA is greater than that for ABC.

72. A block of mass m initially at rest is dropped from a height h on to a spring of force constant k. the maximum compression in the spring is x then



(A) $mgh = \frac{1}{2}kx^2$ (B) $mg(h+x) = \frac{1}{2}kx^2$

(C) $mgh = \frac{1}{2}k(x+h)^2$ (D) None of these

73. A weight lifter lifts 300 kg from the ground to a height of 2m in 3 second. The average power generated by him is

(A) 5880 watt (B) 4410 watt (C) 2205 watt (D) 1960 watt

74. A person standing on the floor of an elevator drops a coin. The coin reaches the floor of the elevator in a time t_1 if the elevator is stationary and in time t_2 if it is moving uniformly. Then:

(A) $t_1 = t_2$ (B) $t_1 < t_2$ (C) $t_1 > t_2$

(D) $t_1 < t_2$ or $t_1 > t_2$ depending on whether the lift is going up or down.

SPACE FOR ROUGH WORK

75. A particle is kept at rest at a distance R (earth's radius) above the earth's surface. The minimum speed with which it should be projected so that it does not return is:

(A) $\sqrt{\frac{GM}{4R}}$ (B) $\sqrt{\frac{GM}{2R}}$ (C) $\sqrt{\frac{GM}{R}}$ (D) $\sqrt{\frac{2GM}{R}}$

76. Which of the following contains the same number of oxygen atoms?

I. 1g of O atoms II. 1g of O_2 III. 1g of ozone O_3

(A) I and II only (B) III and I only (C) II and III only (D) I, II and III

77. When Mg is burnt in the atmosphere of an element X white powder is obtained. When this is dissolved in water it gives a gas Y with pungent smell. What are X and Y ?

(A) C, CH_4 (B) N_2, NH_3 (C) P, H_3PO_4 (D) S, H_2S

78. Nature of products obtained on complete combustion of methane are

(A) Acidic, basic (B) Acidic, neutral (C) Basic, neutral (D) Neutral, neutral

79. A student adds 6.00 g of a solid to 30.0 mL of water. What is the concentration of this solution expressed as mass/mass percent? (Assume the density of water is 1 g/ml)

(A) 0.167% (B) 0.200% (C) 16.7% (D) 20.0%

80. A salt of binary acid H_2S is M_2S_3. Find the valency of metal M

(A) 1 (B) 2 (C) 3 (D) 4

81. Assertion (P) : A gas can be easily liquefied at any temperature below its critical temperature.

Reason (Q) : Liquification of a gas takes place when the average kinetic energy of the molecules is low.

(A) Both (P) and (Q) are correct and (Q) is the correct explanation of (P)

(B) Both (P) and (Q) are correct, but (Q) is not the correct explanation of (P)

(C) (P) is correct, but (Q) is incorrect

(D) (P) is incorrect, but (Q) is correct

SPACE FOR ROUGH WORK

82. Identify the correct increasing order of molecular weights

(A) $H_2O > NO > CO_2 > SO_2$ (B) $H_2O > SO_2 > NO > CO_2$

(C) $SO_2 < CO_2 < NO < H_2O$ (D) $H_2O < NO < CO_2 < SO_2$

83. Which of the following statements is true about the evaporation of water from an open container?

(A) Evaporation is slower when there is a breeze.

(B) Evaporation takes place faster on a humid day.

(C) The process of evaporation gives off energy.

(D) Some water particles leave the surface and become part of the air.

84. Choose the correct option :

Statement - P : It is difficult to cook food at hill.

Statement - Q : The boiling point of water increases at hill.

(A) Statement P and Q are correct and statement Q is the correct explanation of statement P.

(B) Statement P and Q are incorrect.

(C) Statement P is correct but statement Q is incorrect.

(D) Statement P is incorrect but statement Q is correct.

85. The chemical added to LPG to help in detection of its leakage is

(A) Isobutane (B) Alcohol (C) Methyl mercaptan (D) Ethyl mercaptan

SPACE FOR ROUGH WORK

86. In liquids, intermolecular forces of attraction are

(A) Very weak compared with kinetic energies of the molecules

(B) Strong enough to hold molecules relatively close together

(C) Strong enough to keep the molecules confined to vibrating about their fixed lattice points

(D) Strong enough to hold molecules relatively close together but not strong enough to keep molecules from moving past each other

87. Identify the least reactive element from the following:

(A) ${}_{8}X^{16}$ (B) ${}_{10}X^{20}$ (C) ${}_{11}X^{23}$ (D) ${}_{9}X^{19}$

88. Which of the following is the composition of coal gas ?

(A) H_2, C_2H_6,CO_2 (B) H_2, CH_4,CO (C) H_2O, C_2H_6,CO (D) H_2O, CH_4,CO_2

89. Which of the following is an example of strategic metal ?

(A) Fe (B) Al (C) Zn (D) Ti

90. Bleeding from a cut can be immediately stopped by applying ferric chloride because

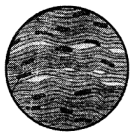
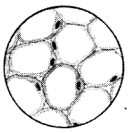
(A) Ferric chloride block the surface of cut

(B) Blood contain negatively charged colloidal particles and they are precipitated with $FeCl_3$

(C) $FeCl_3$ prepare the membrane over the cut

(D) None of these

91. Identify the tissue that is present in the bone.

(A)  (B)  (C)  (D) 

SPACE FOR ROUGH WORK

92. What is the function of the chloroplast ?

(A) To absorb carbon dioxide during photoynthesis

(B) To break up water into hydrogen and oxygen during photosynthesis

(C) To absorb food

(D) To form protein and amino acids in the presence of sunlight

93. Which of the following tissues has a single nucleus, tapers at both ends and shows involuntary movements?

(A) Straited muscle (B) Smooth muscle (C) Cardiac muscle (D) Skeletal muscle

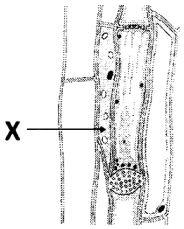
94. Which of the following connects bones and muscles ?

(A) Tendons (B) Ligament (C) Collagen (D) Cartilage

95. Which of the following part of digestive system helps in water absorption

(A) Oesophagus (B) Colon (C) Stomach (D) Tongue

96. Identify the part labelled X ?



(A) Sieve tube

(B) Sieve plate

(C) Companion cell

(D) Sieve pore

97. The animal feed which is rich in nutrients but contains little fibres is :

(A) Roughage (B) Ration (C) Concentrates (D) None of these

SPACE FOR ROUGH WORK

98. Wax glands of honey bee are present in :

(A) Queen (B) Drones (C) Workers (D) All of these

99. 'Drones' in the honeybee colony are born out from :

(A) Fertilized eggs and well nourished larvae (B) Unfertilized eggs

(C) Same as worker bee (D) Fertilized eggs giving heat treatment

100. Milk does not provide :

(A) Vitamin A (B) Carbohydrates, proteins and fats

(C) Minerals such as phosphorus and calcium (D) Vitamin C

101. Which of the following is not a salivary gland ?

(A) Sublingual (B) Lacrymal (C) Submaxillary (D) Parotid

102. Movement of food through the oesophagus is due to

(A) Lubrication of saliva (B) Peristalsis

(C) Gravitational pull (D) All of these

103. Where is bile produced ?

(A) Gall bladder (B) Blood (C) Liver (D) Spleen

104. To prevent the entry of food into the trachea the opening is guarded by

(A) Epiglottis (B) Glottis (C) Hard palate (D) Soft palate

105. The Heart is enclosed by a double-layered membrane which is called

(A) Pleura (B) Bronchi (C) Pericardium (D) None of these

SPACE FOR ROUGH WORK

PART – III (Mathematics)

Single Correct Type)

106. If $x^{51}+51$ is divided by (x+1) the remainder is

(A) 0 (B) 1 (C) 49 (D) 50

107. The pair of equations $3^{x+y}=81, 81^{x-y}=3$ has :

(A) No solution (B) The solution $x=2\frac{1}{2}, y=2\frac{1}{2}$

(C) The solution $x=2, y=2$ (D) The solution $x=2\frac{1}{8}, y=1\frac{7}{8}$

108. For what value of 'k' will $x^2-(3k-1)x+2k^2+2k=11$ have equal roots ?

(A) 9, –5 (B) –9, 5 (C) 9, 5 (D) –9, –5

109. If α and β are the roots of $x^2+p=0$ where p is s prime, then which equation has the roots $\frac{1}{\alpha}\&\frac{1}{\beta}$?

(A) $\frac{1}{x^2}+\frac{1}{p}=0$ (B) $px^2+1=0$ (C) $px^2-1=0$ (D) $\frac{1}{x^2}-\frac{1}{p}=0$

110. If $\tan 2A=\cot(A-18^o)$, where 2A is an acute angle, then the value of A.

(A) 36^o (B) 63^o (C) 26^o (D) 62^o

111. A point on x-axis which is equidistant from the points (3, 4) and (2, 5) is :

(A) (2, 0) (B) (–2, 0) (C) (4, 0) (D) None of these

SPACE FOR ROUGH WORK

112. Simplify: $\frac{2}{\sqrt{5}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{2}}-\frac{3}{\sqrt{5}+\sqrt{2}}$

(A) 1 (B) 0 (C) 10 (D) 100

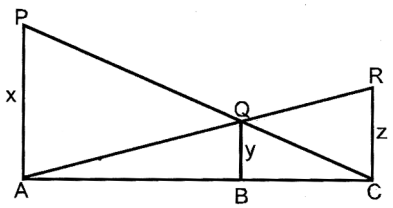
113. In figure, PA , QB and RC are each perpendicular to AC. Then : $\frac{1}{x}+\frac{1}{z}=$

(A) 1

(B) y

(C) $\frac{1}{y}$

(D) None



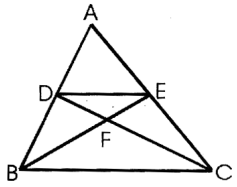
114. In the given figure, $DE \| BC$ and $AD : DB = 5 : 4$, find $\frac{\text{area}(\Delta DFE)}{\text{area}(\Delta CFB)}$.

(A) 5 : 9

(B) 25 : 16

(C) 25 : 81

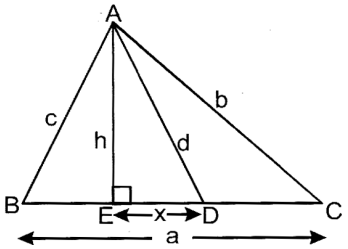
(D) None of these



115. In the following figure, $AE \perp BC$, D is the mid point of BC, then x is equal to

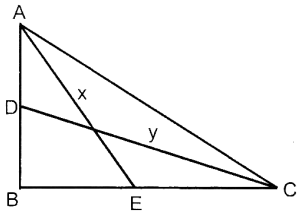
(A) $\frac{1}{a}\left[b^2-d^2-\frac{a^2}{4}\right]$ (B) $\frac{h+d}{3}$

(C) $\frac{c+d-h}{2}$ (D) $\frac{a^2+b^2+d^2-c^2}{4}$



SPACE FOR ROUGH WORK

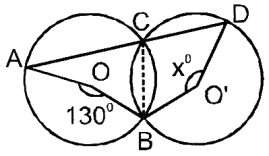
116. ΔABC is a right angled triangle , where $\angle B = 90^o$, CD and AE are medians . If AE = x and CD = y then, correct statement is :



(A) $x^2 + y^2 = AC^2$ (B) $x^2 + y^2 = 2AC^2$

(C) $x^2 + y^2 = \frac{3}{2}AC^2$ (D) $x^2 + y^2 = \frac{5}{4}AC^2$

117. In the given figure, O,O' are centres of two circles, intersecting at B and C . ACD is a straight line. Find x.



(A) 130^o

(B) 50^o

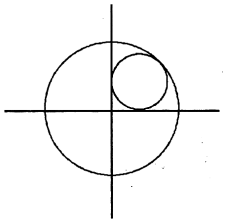
(C) 40^o

(D) None of these

118. The area of a circle is doubled when its radius r is increased by a . Therefore , radius r equals :

(A) $\left(\sqrt{2}+1\right)a$ (B) $\left(\sqrt{2}-1\right)a$ (C) a (D) $\left(2-\sqrt{2}\right)a$

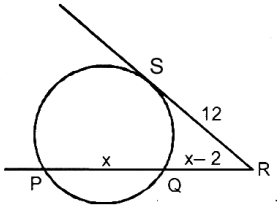
119. In the figure shown, the bigger circle has radius 1 unit. Therefore, the radius of smaller circle must be :



(A) $\sqrt{3}+1$ (B) $\frac{1}{2}$

(C) $\frac{1}{\sqrt{2}}$ (D) $\frac{1}{\sqrt{2}+1}$

120. PQ is a chord of circle. The tangent at S on the circle cuts PQ produced at R. If SR = 12cm, PQ = x cm, QR = x–2 cm, then x in cm is :



(A) 6

(B) 7

(C) 10

(D) 14

❑❑❑

SPACE FOR ROUGH WORK

ANSWER KEY

Code A

Course 3

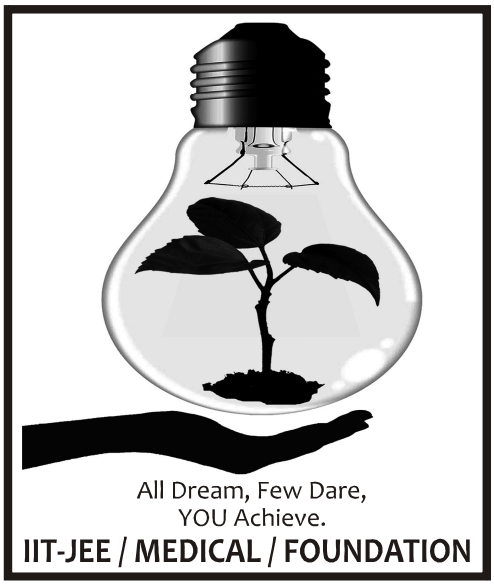
Class 9 going to Class 10 Students

PART - I						PART - II						PART - III	
01.	A	21.	C	41.	C	61.	D	81.	A			106.	D
02.	B	22.	B	42.	B	62.	C	82.	D			107.	D
03.	D	23.	A	43.	C	63.	C	83.	D			108.	C
04.	C	24.	C	44.	D	64.	B	84.	C			109.	B
05.	D	25.	D	45.	A	65.	C	85.	D			110.	A
06.	D	26.	C	46.	B	66.	A	86.	D			111.	B
07.	A	27.	A	47.	A	67.	A	87.	B			112.	B
08.	B	28.	B	48.	C	68.	A	88.	B			113.	C
09.	B	29.	A	49.	B	69.	D	89.	D			114.	C
10.	C	30.	B	50.	A	70.	B	90.	B			115.	A
11.	D	31.	A	51.	B	71.	A	91.	C			116.	D
12.	A	32.	C	52.	C	72.	B	92.	B			117.	A
13.	D	33.	D	53.	A	73.	D	93.	B			118.	A
14.	B	34.	B	54.	B	74.	A	94.	A			119.	D
15.	B	35.	B	55.	D	75.	C	95.	B			120.	C
16.	D	36.	D	56.	B	76.	D	96.	C				
17.	D	37.	A	57.	D	77.	B	97.	C				
18.	C	38.	A	58.	B	78.	B	98.	C				
19.	D	39.	B	59.	C	79.	C	99.	B				
20.	C	40.	C	60.	A	80.	C	100.	D				
								101.	B				
								102.	B				
								103.	C				
								104.	A				
								105.	C				

ADMISSION TEST

Code A

Brother's Academy



Course 4

Class 10 going to Class 11 Students

Read the following Instructions very carefully before you proceed

SAMPLE COPY

- The paper is divided into **TWO PARTS**. PART - I contains 45 question of **Mathematical Reasoning.** PART - II contains 75 question of **Section - I** (Physics - 25), **Section - II** (Chemistry - 25) & **Section - III** (Mathematics - 25).
- It contains a total of **120 questions** and **31 printed pages.**
- For answering a question, an ANSWER SHEET is provided separately. Please fill your Reg. No. and Paper set Properly in the space given in the ANSWER SHEET.
- Please darken the entire circle that corresponds to your answer for each question. Use only HB pencil or Ball Point Pen to mark answer, and erase pencil marks completely to make a change. Do not scribble anything on the answer sheet.

Wrong way of filling

A B C D A B C D

○ ⊗ ○ ○ ○ ∅ ○ ○

Right way of filling

A B C D

○ ● ○ ○

- **Full Marks 360. Total Time $2\frac{1}{2}$ Hrs.**
- Marking Scheme : ONLY ONE correct option and each question carries **3** Marks and **–1** will be awarded for every wrong answer. **(NEGATIVE MARKING).**

Name : _____ Reg. No. : _____

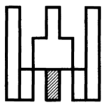
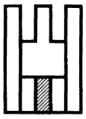
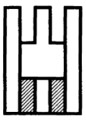
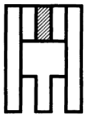
PART – I (Mathematical Reasoning)

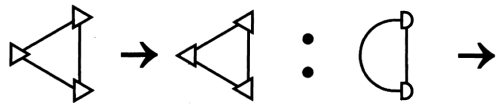
(Single Correct Type)

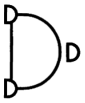
Direction (Questions 01 to 05):

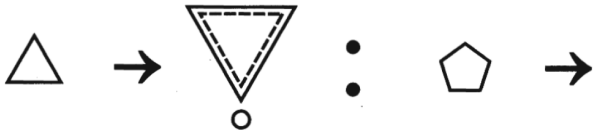
On the left there are two shapes with an arrow between them. Decide how the second is related to the first. After these there is a third shape, then an arrow and then four more shapes. Decide which of the four shapes goes with the third one to make a pair like the two on the left.

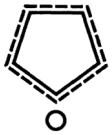
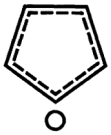
01. 

(A)  (B)  (C)  (D) 

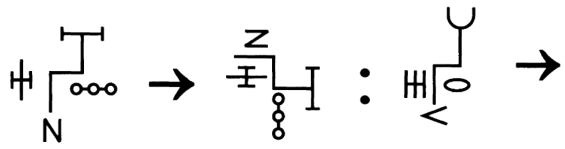
02. 

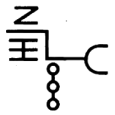
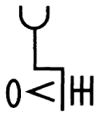
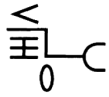
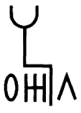
(A)  (B)  (C)  (D) 

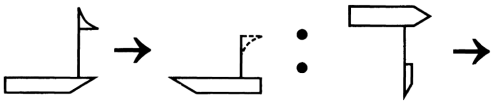
03. 

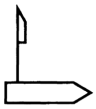
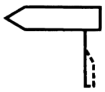
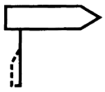
(A)  (B)  (C)  (D) 

SPACE FOR ROUGH WORK

04. 

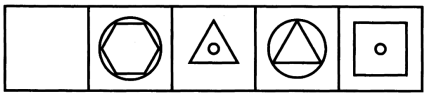
(A)  (B)  (C)  (D) 

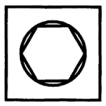
05. 

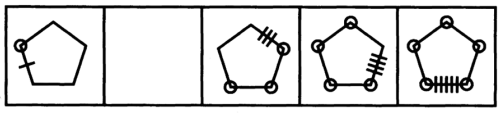
(A)  (B)  (C)  (D) 

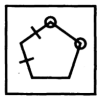
Direction (Questions 06 to 10):

To the left there are four squares arranged in order. One of these squares has been left empty. One of the four squares on the right should take the place of the empty square.

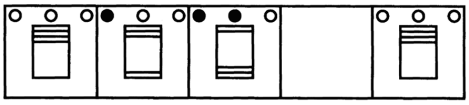
06. 

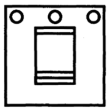
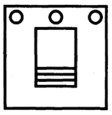
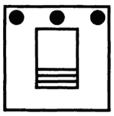
(A)  (B)  (C)  (D) 

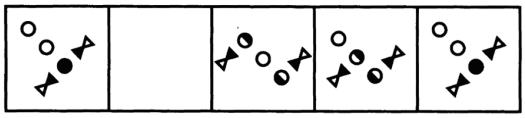
07. 

(A)  (B)  (C)  (D) 

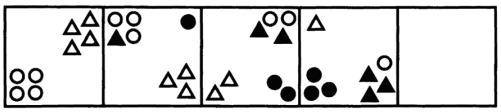
SPACE FOR ROUGH WORK

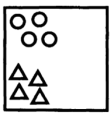
08. 

(A)  (B)  (C)  (D) 

09. 

(A)  (B)  (C)  (D) 

10. 

(A)  (B)  (C)  (D) 

Direction:

Questions 11 to 15 are based on letter series. In each question some letters are missing. The missing letters are given in the proper sequence as one of the alternatives among the four given under each question. Fnd the correct alternative in each case.

11. - b - abb - - bab - - bba

(A) bababa (B) ababba (C) bbbaaa (D) abababa

SPACE FOR ROUGH WORK

12. - ab - a - bab - - bbabb -

(A) bbbbaa (B) ababbb (C) aabaab (D) bbaaba

13. - ab - a - bba - bb - a -

(A) abbbab (B) babbba (C) bbaabb (D) abaaab

14. - - dan - - nda - dand - n

(A) ndanda (B) dnadna (C) andana (D) anndna

15. - abb - -bb - a - bbab - ba

(A) ababaa (B) bababa (C) abbbaa (D) bbabbb

Direction:

Questions 16 to 19 are based on a cube. Each of the sides is coloured differently. The detailed positons of each side are:

(i) Red side is opposite to the green one

(ii) Blue side is between red and green ones

(iii) Yellow side is adjacent to the orange one

(iv) The white side is adjacent to the yellow one, and

(v) The green side is face down.

16. The side opposite to blue is

(A) Red (B) Yellow (C) White (D) Orange

17. The four colours adjacent to yellow are

(A) red, white, blue, orange (B) green, white, blue, orange

(C) blue, orange, red, green (D) white, orange, red, green

SPACE FOR ROUGH WORK

18. The side facing up is

(A) Blue (B) White (C) Red (D) Orange

19. The side opposite to orange is

(A) White (B) Green (C) Blue (D) Yellow

Directions:

Read the following statements carefully and answer questions 20-21.

A is the father of C, but C is not his son

B is the brother of C. D is the son of B

E is the daughter of C. F is the spouse of A

G is the spouse of B. H is the father of G

20. Who is the grand mother of D?

(A) H (B) A (C) C (D) F

21. Who is the son of F?

(A) B (B) C (C) E (D) D

Direction:

Questions 22 –26 Which one number will complete the following number series?

22. 2, 6, 14, 30, 62, ?, 254

(A) 124 (B) 126 (C) 132 (D) 142

23. 8, 9, 8, 7, 10, 9, 6, 11, 10, ?, 12

(A) 11 (B) 8 (C) 7 (D) 5

24. 2, 6, 12, 20, 30, 42, ?

(A) 56 (B) 54 (C) 50 (D) 62

25. 4, 11,7, 14, 10, 17, ?

(A) 24 (B) 13 (C) 20 (D) 21

SPACE FOR ROUGH WORK

26. 2, 5, 9, ?, 20, 27

(A) 14 (B) 16 (C) 18 (D) 24

Direction:

In questions 27 to 30, there is a blank space in each question in which only one of the four alternatives given under the question satisfies the same relationship us is found between the two terms on the other side of sign :: given in each question. Find the correct alternative in each question.

27. _____: QUHMDF :: WIDELY : HVCDXK

(A) FRINGE (B) FRANCE (C) STRING (D) DEMAND

28. NUMBER : UNBMRE :: GHOST :

(A) HOGST (B) HOGTS (C) HGOST (D) HGSOT

29. _____: DURXQG :: POLITY : SROLWB

(A) AROUND (B) SHOULD (C) ARMOUR (D) GROUND

30. _____: QHGXKZ :: XHULAM : OYNSJV

(A) BRAZIL (B) SENIOR (C) BIZEJO (D) MOSQUE

31. A group of 6 students comprised of 3 boys and 3 girls. Number of ways could they be arranged in a straight line such that the girls and the boys occupy alternate positions is :

(A) 36 (B) 72 (C) 108 (D) 144

32. How many numbers than 4000 can be made by using the digits 2,3,4 and 5 ? (Repetition of digits is not allowed)

(A) 12 (B) 14 (C) 20 (D) 24

33. Nine persons went to a hotel for taking their meals. Eight of them spent Rs. 12 each on their meals and the ninth spent Rs. 8 more than the average expenditure of all the nine. What was the total money spent by the them ?

(A) Rs. 115 (B) Rs. 118 (C) Rs. 120 (D) Rs. 117

SPACE FOR ROUGH WORK

34. The average age of a group of persons going for picnic is 16 years. Twenty new persons with an average age of 15 years join the group on the spot, due to which their average becomes 15.5 years. The number of persons initially going for picnic is:

(A) 5 (B) 10 (C) 20 (D) 30

35. A thief is spotted by a policeman from a distance of 100 metres. When the policeman starts the chase, the thief also starts running. If the speed of the thief be 8 km/hr and that of the policeman 10 km/hr, how far the thief will have run before he is overtaken ?

(A) 300 m (B) 350 m (C) 400 m (D) 450 m

36. Anna left for city A from city B at 5.20 a.m. She travelled at the speed of 80 km/hr. for 2 hours 15 minutes. After that the speed was reduced to 60 km / hr. If the dis-tance between two cities is 350 kms, at what time did Anna reach cityA?

(A) 9.20 a.m. (B) 9.25 a.m. (C) 9.35 a.m. (D) 10.25 a.m.

37. A leak in the bottom of a tank can empty it in 6 hr. A pipe fills in the tank at the rate of 4 liters per minutes. When the tank is full, the inlet is opened but leak emptied the tank in 8 hr. What is the capacity of the tank ?

(A) 5260 L (B) 5670 L (C) 5946 L (D) 5760 L

38. Ronald and Elan are working on an assignment. Ronald takes 6 hours to type 32 pages on a computer. while Elan takes 5 hours to type 40 pages. How much time will they take, working together on two different computers to type an assignment of 110 pages ?

(A) 7 hours 30 minutes (B) 8 hours

(C) 8 hours 15 minutes (D) 8 hours 25 minutes

39. Find out $(A+B+C+D)$ such that $AB \times CB = DDD$, where AB and CB are two-digit numbers and DDD is a three digit number.

(A) 21 (B) 19 (C) 17 (D) 18

SPACE FOR ROUGH WORK

40. The smallest number which when divided by 20, 25, 35 and 40 and leaves a remainder of 14, 19, 29 and 34 respectively is:

(A) 1394 (B) 1404 (C) 1664 (D) 1406

41. In a recent survey, 40% houses contained two or more people. Of those houses containing only one person, 25% were having only a male. What is the percentage of all houses, which contain exactly one female and no males?

(A) 15 (B) 45 (C) 75 (D) Can't be determined

42. Prices register an increase of 10% on foodgrains and 15% on other items of expenditure. If the ratio of an employee's expenditure on foodgrains and other items be 2:5, by how much should his salary be increased in order that he may maintain the same level of consumption as before, his present salary being Rs. 2590.

(A) Rs. 323.75 (B) Rs. 350 (C) Rs. 360.50 (D) None of these

43. Avinash covered 150 km distance in 10 hours. The first part of his journey he covered by car, then he hired a rickshaw. The speed of car and rickshaw is 20 km/hr and 12 km/hr respectively. The ratio of distances covered by car and the rickshaw respectively are:

(A) 2 : 3 (B) 4 : 5 (C) 1 : 1 (D) None of these

44. A mixture of rice is sold at Rs. 3.00 per kg. This mixture is formed by mixing the rice of Rs. 2.10 and Rs. 2.52 per kg. What is the ratio of price of cheaper to the costlier quality in the mixture if the profit of 25% is being earned.

(A) 5 : 2 (B) 2 : 7 (C) 2 : 5 (D) 15 : 8

45. A manufacturer sells a pair of glasses to a wholesale dealer at a profit of 18%. The wholesaler sells the same to a retailer at a profit of 20%. The retailer in turn sells them to a customer for Rs. 30.09, thereby earning a profit of 25%. The cost price for the manufacturer is:

(A) Rs. 15 (B) Rs. 16 (C) Rs. 17 (D) Rs. 18

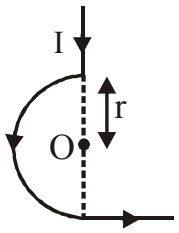
SPACE FOR ROUGH WORK

PART – II

Section - I (Physics)

(Single Correct Type)

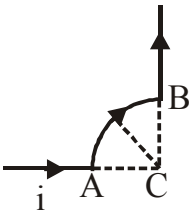
46. In the figure, what is the magnetic field at the point O



(A) $\frac{\mu_0 I}{4\pi r}$ (B) $\frac{\mu_0 I}{4\pi r}+\frac{\mu_0 I}{2\pi r}$

(C) $\frac{\mu_0 I}{4r}+\frac{\mu_0 I}{4\pi r}$ (D) $\frac{\mu_0 I}{4r}-\frac{\mu_0 I}{4\pi r}$

47. A wire carrying current i is shaped as shown. Section AB is a quarter circle of radius r. The magnetic field is directed



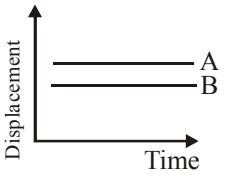
(A) At an angle $\pi/4$ to the plane of the paper.

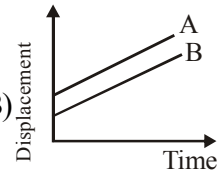
(B) Perpendicular to the plane of the paper and directed in to the paper.

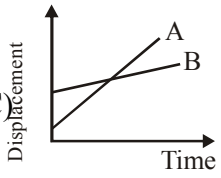
(C) Along the bisector of the angle ACB towards AB.

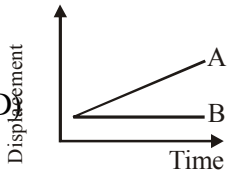
(D) Along the bisector of the angle ACB away from AB.

48. Which one of the following represents displacement time graph of two objects A and B moving with zero relative velocity?

(A) 

(B) 

(C) 

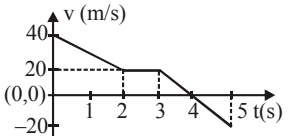
(D) 

49. The decrease in the potential energy of a ball of mass 20 kg which falls from a height of 50 cm is

(A) 968 J (B) 98 J (C) 1980 J (D) None of these

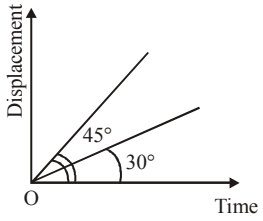
SPACE FOR ROUGH WORK

50. In the given v-t graph the distance travelled by the body in 5 sec. will be



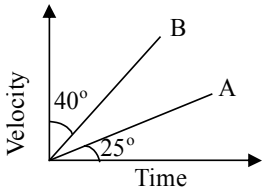
(A) 100 m (B) 80 m (C) 40 m (D) 20 m

51. The displacement-time graphs of two moving particles make angles of 30° and 45° with the X-axis. The ratio of their velocities is –



(A) 1 : $\sqrt{3}$ (B) 1: 2 (C) 1 : 1 (D) $\sqrt{3}$: 2

52. The velocity-time graph for two bodies A and B are shown. Then the acceleration of A and B are in the ratio –



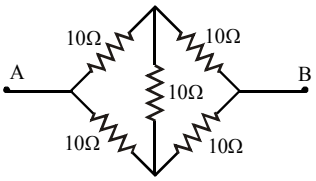
(A) sin 25° to sin 50° (B) tan 25° to tan 40° (C) cos 25° to cos 50° (D) tan 25° to tan 50°

SPACE FOR ROUGH WORK

53. Two monkeys of masses 10kg and 8 kg are moving along a vertical rope which is light and inextensible, the former climbing up with an acceleration of $2m/s^2$ while the latter coming down with a uniform velocity of 2m/s. Find the tension (in Newtons).

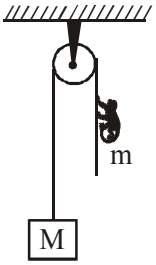
(A) 200N (B) 120N (C) 80N (D) 100N

54. The effective resistance between points A & B is



(A) 10Ω (B) 20Ω (C) 40Ω (D) None of these

55. In the figure, the block of mass M is at rest on the floor. The acceleration with which a monkey of mass m should climb up along the rope of negligible mass so as to lift the block from the floor is –

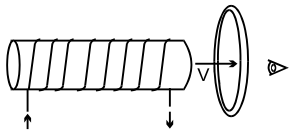


(A) equal to $\left(\frac{M}{m}-1\right)g$ (B) $>\left(\frac{M}{m}-1\right)g$

(C) equal to $\frac{M}{m}g$ (D) $>\frac{M}{m}g$

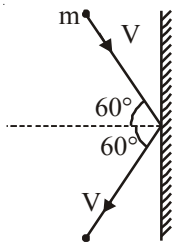
SPACE FOR ROUGH WORK

56. A current carrying solenoid is approaching a conducting loop as shown in the figure. The direction of induced current as observed by an observer on the other side of the loop will be -



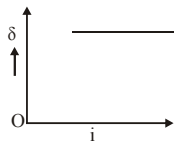
(A) anticlockwise (B) clockwise (C) east (D) west

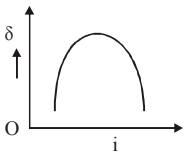
57. A rigid ball of mass m strikes a rigid wall at 60° and gets reflected without loss of speed as shown in the figure. The value of impulse imparted by the wall on the ball will be

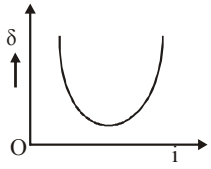


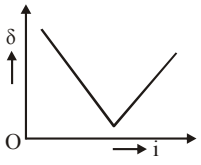
(A) mV (B) 2mV (C) mV/2 (D) mV/3

58. The graph between angle of deviation (δ) and angle of incidence (i) for a triangular prism is represented by

(A) 

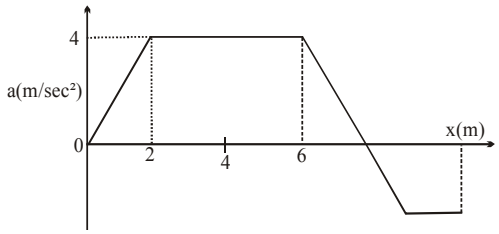
(B) 

(C) 

(D) 

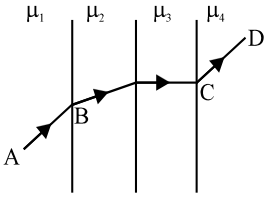
SPACE FOR ROUGH WORK

59. Graph shows the acceleration of a 3 kg particle as an applied force moves it from rest along x-axis. The total work done by the force on the particle by the time the particle reaches x = 6m, is equal to –



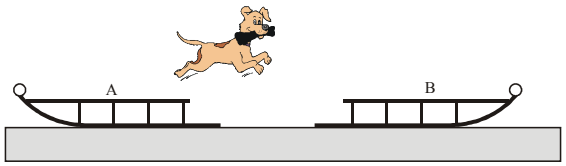
(A) 20 J (B) 60 J (C) 30 J (D) 40 J

60. A ray of light passes through four transparent media with refractive indices μ_1, μ_2, μ_3 and μ_4 as shown in the figure.The surfaces of all media are parallel. If the emergent ray CD is parallel to the incident ray AB, we must have :



(A) $\mu_1 = \mu_2$ (B) $\mu_2 = \mu_3$ (C) $\mu_3 = \mu_4$ (D) $\mu_4 = \mu_1$

61. Two 22.7 kg ice sleds A and B are placed a short distance apart, one directly behind the other, as shown in fig. A 3.63kg dog, standing on one sled, jumps across to the other and immediately back to the first. Both jumps are made at a speed of 3.05 ms^{-1} relative to the ice. Find the final speeds of the two sleds.



(A) 0.841 ms^{-1}, 0.975 ms^{-1} (B) 0.341 ms^{-1}, 0.975 ms^{-1}

(C) 0.841 ms^{-1}, 0.575 ms^{-1} (D) 0.41 ms^{-1}, 0.325 ms^{-1}

SPACE FOR ROUGH WORK

62. Lenz's law is based on:

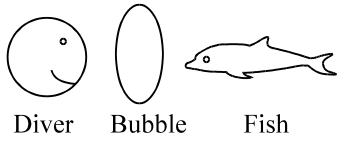
(A) Conservation of linear momentum (B) Conservation of angular momentum

(C) Conservation of energy (D) Conservation of charge

63. By inserting an iron core in a coil carrying current the strength of its magnetic field:

(A) Increases (B) Decreases (C) Remains same (D) Becomes Zero.

64. A fish sees the smiling face of a scuba diver through a bubble of air between them, as shown. Compared to the face of the diver, the image seen by the fish will be –



(A) smaller and erect

(B) smaller and inverted

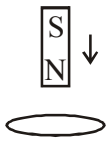
(C) larger and erect

(D) Can be either of above depending on the distance of the diver.

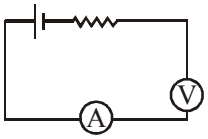
65. A magnet is dropped freely towards a loop of copper wire as shown in figure. The acceleration of magnet will be:

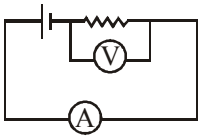
(A) Equal to g (B) Greater than g

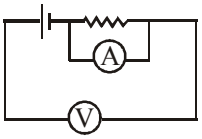
(C) Less than g (D) Zero

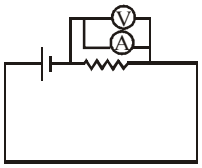


66. Indentify the circuit in which electric components have been properly connected:

(A) 

(B) 

(C) 

(D) 

SPACE FOR ROUGH WORK

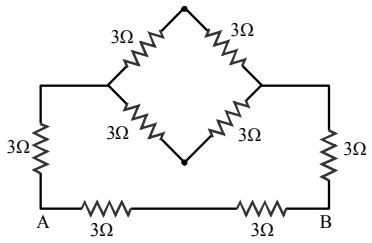
67. An electric lamp uses energy at the rate of 48 w on 12 v supply. How much charge passes through the lamp in 2 seconds:

(A) 4 amperes (B) 8 amperes (C) 4 coulombs (D) 8 coulombs.

68. A pieceof wire of resistance R is cut into n equal parts. These parts are then connected in parallel. If the equivalent resistance of parallel combination is R', then $\left(\frac{R}{R'}\right)$ is:

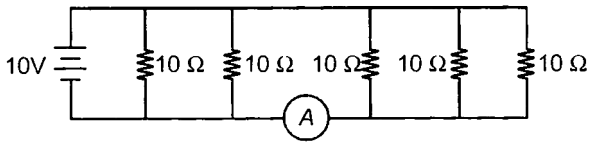
(A) $\frac{1}{1}$ (B) $\frac{n}{1}$ (C) $\frac{n^2}{1}$ (D) $\frac{1}{n}$

69. Equivalent resistance between A and B will be



(A) 2 ohm (B) 18 ohm (C) 6 ohm (D) 3.6 ohm

70. In the electric circuit given below, the reading of the ammeter is:



(A) 1 A (B) 2 A (C) 3 A (D) 5 A

SPACE FOR ROUGH WORK

Section - II (Chemistry)

(Single Correct Type)

71. Read the following and answer the question.

The primary reason behind the formation of the toxic foam is high phosphate content in the wastewater because of detergents used in dyeing industries, dhobi ghats and households. Yamuna's pollution level is so bad that parts of it have been labelled 'dead' as there is no oxygen in it for aquatic life to survive.

Predict the pH value of the water of river Yamuna if the reason for froth is high content of detergents dissolved in it.

(A) 10-11 (B) 5-7 (C) 2-5 (D) 7

72. Aspirin has the formula $C_9H_8O_4$. How many atoms of oxygen are there in a tablet weighing 360 mg?

(A) 1.204×10^{23} (B) 1.08×10^{22} (C) 1.204×10^{24} (D) 4.81×10^{21}

73. In the decomposition of lead (II) nitrate to give lead (II) oxide, nitrogen dioxide and oxygen gas, the coefficient of nitrogen dioxide (in the balanced equation) is

(A) 1 (B) 2 (C) 3 (D) 4

74. Which has minimum number of oxygen atoms?

(A) 10ml $H_2O(l)$ (B) 0.1 mole of $V_2O_5(s)$

(C) 12gm of $O_3(g)$ (D) 12.044×10^{22} molecules of CO_2

SPACE FOR ROUGH WORK

75. An element X on exposure to moist air turns reddish - brown and a new compound Y is formed. The substrate X and Y are

(A) X = Fe, Y = Fe_2O_3 (B) X = Ag, Y = Ag_2S

(C) X = Cu, Y = CuO (D) X = Al, Y = Al_2O_3

76. In which of the following, heat energy will be evolved ?

(A) Electrolysis of water.

(B) Dissolution of NH_4Cl in water

(C) Burning of L.P.G

(D) Decomposition of AgBr in the presence of sunlight.

77. The table provides the pH value of four solutions P, Q, R and S

Solution	pH value
P	2
Q	9
R	5
S	11

Which of the following correctly represents the solutions in increasing order of their hydronium ion concentration ?

(A) P>Q>R>S (B) P>S>Q>R (C) S<Q<R<P (D) S<P<Q<R

78. A student while walking on the road observed that a cloud of black smoke belched out from the exhaust stack of moving trucks on the road.' Choose the correct reason for the production of black smoke:

(A) Limited supply of air leads to incomplete combustion of fuel.

(B) Rich supply of air leads to complete combustion of fuel.

(C) Rich supply of air leads to a combination reaction.

(D) Limited supply of air leads to complete combustion of fuel.

SPACE FOR ROUGH WORK

79. When Barium chloride solution is added to sulphuric acid, a white precipitate 'X' is formed which is insoluble in any mineral acid. The compound is ?

(A) Barium sulphite (B) Barium hydroxide (C) Barium sulphate (D) None of these

80. Calculate the molecular formula of the compound having following percentage composition :

C = 26.59% ; H = 2.22% ; O = 71.19%

Its vapour density is 45.

(A) $C_4H_4O_4$ (B) CHO_2 (C) $C_2H_2O_4$ (D) CH_2O

81. Identify the correct order of reactivity of metals among the following

(A) Cu < Fe < Zn < Al < Na (B) Fe < Zn < Cu < Na < Al

(C) Zn < Cu < Fe < Al < Na (D) Cu < Zn < Al < Na < Fe

82. In the thermite process, the reducing agent used is

(A) Calcium (B) Sodium (C) Coke (D) Aluminum powder

83. Which of the following are the ingredients of gun metal ?

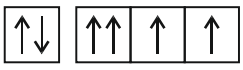
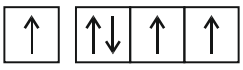
(A) Iron, Tin (B) Copper, Tin

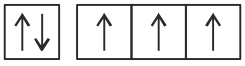
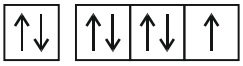
(C) Iron, Copper,zinc, Tin (D) Iron, zinc, Titanium

84. α -particles are represented by:

(A) Lithium atoms (B) Helium Nuclei (C) Hydrogen Nuclei (D) None of these

85. The orbital diagram in which aufbau principle is violated is.

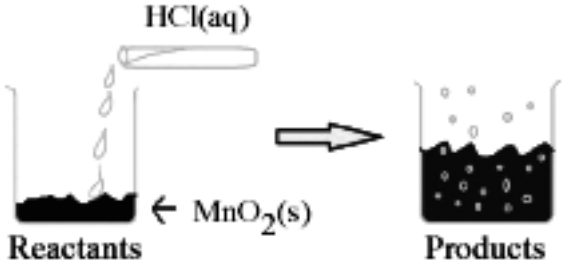
(A)  (B) 

(C)  (D) 

SPACE FOR ROUGH WORK

86. Read the following and answer the questions.

The reaction between MnO_2 with HCl is depicted in the following diagram. It was observed that a gas with bleaching abilities was released.



Identify the correct statement from the following:

(A) MnO_2 is getting oxidized whereas HCl is getting reduced.

(B) MnO_2 and HCl both are getting reduced.

(C) MnO_2 and HCl both are getting oxidized.

(D) MnO_2 is getting reduced. whereas HCl is getting oxidized.

87. The metal with lowest density is

(A) Sodium (B) Potassium (C) Lithium (D) Caesium

88. An additional substance added during smelting, which reacts with impurities to form a fusible product is called

(A) Flux (B) Slag (C) Gangue (D) Mud

89. The correct IUPAC name of $CH_3CH_2CH_2COOH$ is:

(A) Propan-1-oic acid (B) Butan-1-oic acid

(C) Propane -1- carboxylic acid (D) Butanoic -1- carboxylic acid.

SPACE FOR ROUGH WORK

90. 2-Methyl-2-butene will be represented as:

(A) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2CH_3$

(B) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{C}}=CH-CH_3$

(C) $CH_3-CH_2-\underset{\displaystyle CH_3}{\underset{|}{C}}=CH_2$

(D) $CH_3-CH-\underset{\displaystyle CH_3}{\underset{|}{CH}}=CH_2$

91. Write down the IUPAC name of given organic compound.

$$H_3C-\underset{\displaystyle C_2H_5}{\underset{|}{CH}}-\underset{\displaystyle C_3H_7}{\underset{|}{CH}}-CH_3$$

(A) 2-Ethyl-3-propylbutane

(B) 2-Propyl-3-ethylbutane

(C) 3,4-dimethylheptane

(D) 3-Methyl-4-propylpentane

92. Marble's popularity began in ancient Rome and Greece, where white and off-white marble were used to construct a variety of structures, from hand-held sculptures to massive pillars and buildings.

The substance not likely to contain $CaCO_3$ is

(A) Dolomite (B) A marble statue (C) Calcined gypsum (D) Sea shells.

SPACE FOR ROUGH WORK

93. Potash alum is an example of:

(A) Basic salt (B) Normal salt (C) Acid salt (D) Double salt

94. A solution turns methyl orange red. If can turn the universal indicator to:

(A) Violet (B) Blue (C) Orange (D) Green

95. Given

$$Pb + Cu(NO_3)_2 \longrightarrow Pb(NO_3)_2 + Cu$$

$$Cu + 2AgNO_3 \longrightarrow Cu(NO_3)_2 + 2Ag$$

$$Zn + Pb(NO_3)_2 \longrightarrow Zn(NO_3)_2 + Pb$$

The least reactive metal is:

(A) Cu (B) Pb (C) Ag (D) Zn.

SPACE FOR ROUGH WORK

Section - III (Mathematics)

(Single Correct Type)

96. "Identify the option from following which correctly matches the statements of Column-I with Column-II"

Column –I	Column – II
(A) $\frac{\cos A}{1+\sin A}+\frac{1+\sin A}{\cos A}$	(p) cosecA+cotA
(B) $\frac{\cos A-\sin A+1}{\cos A+\sin A-1}$	(q) 2secA
(C) $\sqrt{\frac{1+\sin A}{1-\sin A}}$	(r) secA+tanA
(D) $\frac{\sin^2 A}{1-\cos A}$	(s) $\frac{1+\sec A}{\sec A}$

(A) A–s,B–q,C–p,D–r (B) A–q,B–p,C–r,D–s

(C) A–q,B–r,C–p,D–s (D) A–p,B–q,C–r,D–s

97. In ΔABC , if AD is the bisector of $\angle A$. Then $\frac{\text{Area}(\Delta ABD)}{\text{Area}(\Delta ACD)}=\frac{?}{AC}$. What is ? .

(A) DC (B) AB (C) BD (D) None

98. Find the perimeter and area of the quadrilateral ABCD in which AB = 17cm , AD = 9cm, CD = 12cm , $\angle ACB = 90^o$ and AC = 15cm

(A) 23cm, $114cm^2$ (B) 46cm, $114cm^2$ (C) 69cm, $195cm^2$ (D) None of these

SPACE FOR ROUGH WORK

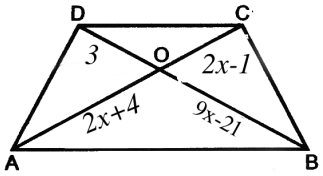
99. In a trapezium ABCD, $AB \| DC$ and $DC = 2AB$. EF drawn parallel to AB cuts AD in F and BC in E such that $\frac{BE}{EC} = \frac{3}{4}$. Diagonal DB intersects EF at G. Then $\frac{FE}{AB} =$

(A) $\frac{7}{10}$ (B) $\frac{10}{7}$ (C) $\frac{1}{7}$ (D) $\frac{1}{10}$

100. " Identify the option from following which correctly matches the statements of Column-I with Column-II "

Column - I **Column - II**

(A) In a given ΔABC, $DE \| BC$ & $\frac{AD}{DB} = \frac{3}{5}$, If $AC = 5.6$cm. then AE = ...cm. (p) 6



(B) If $\Delta ABC \sim \Delta DEF$ such that $2AB = 3DE$ and BC = 6cm, then EF = ...cm. (q) 4

(C) If $\Delta ABC \sim \Delta PQR$ such that $ar(\Delta ABC) : ar(\Delta PQR) = 9:16$ and BC = 4.5cm, then QR = ...cm. (r) 3

(D) In the given figure, $AB \| CD$ & $OA = (2x + 4)$ cm, $OB = (9x - 21)$ cm, OC = (2x–1) cm and OD = 3cm. Then x = ? (s) 2.1

(A) (A) – s, (B)–q,(C)–p, (D)-r (B) (A) – r, (B)–p,(C)–q, (D)-s

(C) (A) – s, (B)–p,(C)–q, (D)-r (D) (A) – p, (B)–q,(C)–r, (D)-s

SPACE FOR ROUGH WORK

101. " Identify the option from following which correctly matches the statements of Column-I with Column-II"

Column – I	Column – II
(A) A man goes 10m due east and then 20m due north, his distance from the starting point is ___m.	(p) $25\sqrt{3}$
(B) In an equilateral triangle with each side 10cm, the altitude is __cm.	(q) $5\sqrt{3}$
(C) The area of an equilateral triangle having each side 10cm is __cm^2.	(r) $10\sqrt{5}$
(D) The length of diagonal of a rectangle having length 8m and breadth 6m is _m.	(s) 10

(A) (A) – r, (B)–q,(C)–p, (D)–s (B) (A) – p, (B)–q,(C)–r, (D)–s

(C) (A) –q, (B)–r,(C)–p, (D)–s (D) (A) – s, (B)–r,(C)–p, (D)–q

102. Swati can row her boat at a speed of 5 km/h in still water. If it takes her 1 hour more to row the boat 5.25km upstream than to return downstream, then the speed of the stream

(A) 2km / hr (B) $\frac{25}{2}$ km / hr (C) 3km / hr (D) None

SPACE FOR ROUGH WORK

103. " Identify the option from following which correctly matches the statements of Column-I with Column-II "

Column - I	Column - II
(A) For what value of p, the equation $px^2-18x+1=0$ is a perfect square ?	(p) 2
(B) If $ax^2+bx+c=0$ has equal roots , then find the value of c.	(q) $\frac{1}{2}$
(C) For the quadratic equation $x^2-2x+1=0$, find the value of $x+\frac{1}{x}$	(r) 81
(D) Find the value of k for which the roots of equation $8kx(x-1)+1=0$ are real and equal	(s) $\frac{b^2}{4a}$

(A) (A) – p, (B)–q,(C)–r, (D)–s (B) (A) – q, (B)–p,(C)–r, (D)–s

(C) (A) – r, (B)–s,(C)–p, (D)–q (D) (A) – q, (B)–s,(C)–r, (D)–p

104. Which term of the sequence $20, 19\frac{1}{4}, 18\frac{1}{2}, 17\frac{3}{4}$ is the 1st negative term.

(A) 27^{th} (B) 26^{th} (C) 28^{th} (D) 30^{th}

SPACE FOR ROUGH WORK

105. The area of a traingle is 5. Two of its vertices are (2,1) and (3,–2) . The third vertex lies on y = x+3. Find the third vertex.

(A) $\left(\frac{-3}{2},\frac{3}{2}\right)$ (B) $\left(\frac{13}{2},\frac{17}{2}\right)$ (C) $\left(\frac{3}{2},\frac{-3}{2}\right)$ (D) None

106. Point P divides the line segment joining the points A(–1,3) and B(9,8) such that $\frac{AP}{PB}=\frac{K}{1}$. If P lies on the line x–y+2= 0, then the value of k.

(A) $\frac{3}{2}$ (B) $\frac{1}{2}$ (C) $\frac{2}{1}$ (D) $\frac{2}{3}$

107. " Identify the option from following which correctly matches the statements of Column-I with Column-II "

Column – I	**Column – II**
(A) The coordinates of the point which divides the join of A(–1,7) and B(4,–3) in the ratio 2:3 are	(p) (5,6)
(B) Two vertices of a ΔABC are A(6,4) and B (–2,2) and its centroid is G(3,4). The coordinates of C are	(q) $\sqrt{10}$
(C) If the points A(4,3) and B(x,5) lie on a circle with the centre O(2,3) , then x =	(r) (1,3)
(D) If A (0,–1) , B(2,1) and C(0,3) are the vertices of ΔABC , then the length of median AD is	(s) 2

(A) (A) – r, (B)–p,(C)–s, (D)–q (B) (A) – p, (B)–r,(C)–q, (D)–s

(C) (A) – r, (B)–p,(C)–q (D)–s (D) (A) – s, (B)–p,(C)–r, (D)–q

SPACE FOR ROUGH WORK

108. A boy is standing on the ground and flying a kite with 100m of string at an elevation of 30^o. Another boy is standing on the roof of a 10m high building and is flying his kite at an elevation of 45^o. Both the boys are on opposite sides of both the kites. Then the length of the string that the second boy must have so that the two kites meet. (Boys and kite are in line).

(A) 20 m (B) $40\sqrt{2}$m (C) 60 m (D) 40

109. " Identify the option from following which correctly matches the statements of Column-I with Column-II "

Column - I	**Column - II**
(A) The length of shadow of a tower is $\sqrt{3}$ times the height of the tower. The angle of elevation of the sun is	(p) 40m
(B) The angle of depression of the top of a tower at a point 40m from its base is 45^o. The height of the tower is	(q) 60^o
(C) The angle of elevation of a top of tower from a point 15m away from its base is 30^o. The height of the tower is	(r) 30^o
(D) At a point 14m away from the base of a high piller, the angle of elevation of its top is	(s) $5\sqrt{3}$

(A) (A) – r, (B)–p,(C)–s, (D)–q (B) (A) – p, (B)–q,(C)–s, (D)–r

(C) (A) – s, (B)–p,(C)–q, (D)–r (D) (A) – p, (B)–s,(C)–r, (D)–q

SPACE FOR ROUGH WORK

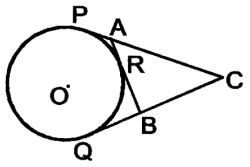
110. In figure, CP and CQ are tangents from an extemal point C to a circle with centre O.AB is another tangent which touches the circle at R. If CP=11cm and BR = 4cm, then the length of BC.

(A) 7cm

(B) 8cm

(C) 10cm

(D) 9cm



111. If a,b,c are in A.P, then $\frac{b-a}{b-c}$ is equal to .....

(A) $\frac{a}{b}$ (B) $\frac{b}{a}$ (C) 1 (D) –1

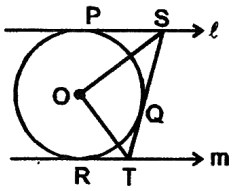
112. In figure ℓ and m are two parallel tangents at P and R to circle of radius 5cm. The tangent at Q makes an intercept ST between ℓ and m, if QT=4cm then $\angle SOT =$.

(A) 75°

(B) 90°

(C) 80°

(D) 53°

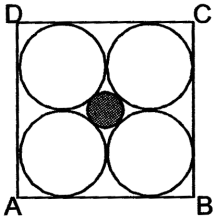


113. The minute hand of a clock is 10cm long. Then the area of the face of the clock described by the minute hand between 9 AM and 9.35AM

(A) 99cm^2 (B) 183.3cm^2 (C) 138.3cm^2 (D) 120cm^2

SPACE FOR ROUGH WORK

114. In given figure , ABCD is a square of 14cm, find the area of shaded portion , if all larger circles are equal

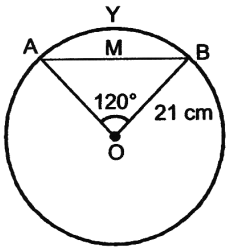


(A) $\frac{57}{2}\left(3-\sqrt{2}\right)\text{cm}^2$ (B) $\frac{59}{3}\left(3-\sqrt{3}\right)\text{cm}^2$

(C) $\frac{77}{2}\left(3-2\sqrt{2}\right)\text{cm}^2$ (D) None of these

115. " Identify the option from following which correctly matches the statements of Column-I with Column-II"

Column - I **Column - II**



(A) Area of segment AYB (p) $\frac{441}{4}\sqrt{3}\text{cm}^2$

(B) Area of sector OAYB (q) $\frac{21}{4}\left(88-21\sqrt{3}\right)\text{cm}^2$

(C) Area of OAB (r) 462cm^2

(D) Length OM (s) $21/2\ \text{cm}^2$

(A) (A) – q, (B)–r,(C)–p, (D)–s (B) (A) – r, (B)–p,(C)–q, (D)–s

(C) (A) – s, (B)–r,(C)–q, (D)–p (D) (A) – r, (B)–s,(C)–p, (D)–q

116. The height of a right circular cylinder is equal to its diameter. If it is melted and recasted into a sphere of radius equal to the radius of the cylinder, then the part of the material that remained unused.

(A) $\frac{1}{3}$ times the volume of the cylinder (B) $\frac{1}{2}$ times the volume of the cylinder

(C) $\frac{1}{4}$ times the volume of the cylinder (D) None

SPACE FOR ROUGH WORK

117. A cone is divided into two parts by drawing a plane through a point which divides its height in the ratio 1:2 starting from the vertex and the plane is parallel to the base. Compare the volume of the two parts

(A) 1: 13 (B) 1 : 26 (C) 1:39 (D) None

118. A number x is chosen at random from the numbers –3,–2,–1,0,1,2,3. The probability that $|x| < 2$ is :

(A) $\frac{5}{7}$ (B) $\frac{3}{7}$ (C) $\frac{2}{7}$ (D) $\frac{1}{7}$

119. A bag contains 40 balls out of which some are red, some are blue and remaining are black. If the probability of drawing a red ball is $\frac{11}{20}$ and that of blue ball is $\frac{1}{5}$, then the number of black balls is :

(A) 5 (B) 25 (C) 10 (D) 30

120. The value of 'p' for which $x + p$ is a factor of $x^2 + px + 3 - p$ is :

(A) 1 (B) –1 (C) 3 (D) –3

❑❑❑

SPACE FOR ROUGH WORK

ANSWER KEY

Code A

Course 4

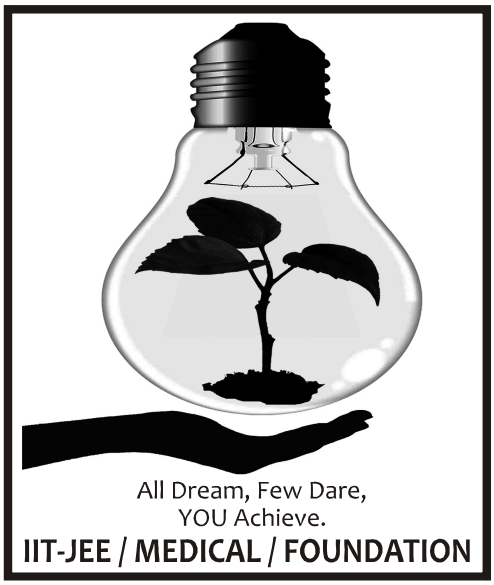
Class 10 going to Class 11 Students

PART - I				PART - II				PART - III	
01.	B	24.	A	46.	C	69.	D	96.	B
02.	D	25.	B	47.	B	70.	C	97.	B
03.	C	26.	A	48.	B	71.	A	98.	B
04.	C	27.	A	49.	B	72.	D	99.	B
05.	B	28.	D	50.	A	73.	D	100.	A
06.	A	29.	A	51.	A	74.	D	101.	A
07.	B	30.	C	52.	A	75.	A	102.	A
08.	D	31.	B	53.	A	76.	C	103.	C
09.	C	32.	A	54.	A	77.	C	104.	C
10.	D	33.	D	55.	B	78.	A	105.	A
11.	B	34.	C	56.	A	79.	C	106.	D
12.	A	35.	C	57.	A	80.	C	107.	A
13.	D	36.	D	58.	C	81.	A	108.	B
14.	C	37.	D	59.	B	82.	D	109.	A
15.	D	38.	C	60.	D	83.	C	110.	A
16.	B	39.	A	61.	A	84.	B	111.	D
17.	D	40.	A	62.	C	85.	B	112.	B
18.	C	41.	B	63.	A	86.	D	113.	B
19.	A	42.	D	64.	A	87.	C	114.	C
20.	D	43.	C	65.	C	88.	A	115.	A
21.	A	44.	B	66.	B	89.	B	116.	A
22.	B	45.	C	67.	D	90.	B	117.	B
23.	D			68.	C	91.	C	118.	B
						92.	C	119.	C
						93.	D	120.	C
						94.	C		
						95.	C		

ADMISSION TEST

Code A

Brother's Academy



Course VI

Class XII Appeared/Passed Students

Read the following Instructions very carefully before you proceed

- The paper is divided into **TWO PARTS**. PART - I contains 30 question of **Basic Aptitude.** PART - II contains 90 question of **Section - I** (Physics - 30), **Section - II** (Chemistry - 30) & **Section - III** (Mathematics - 30).
- It contains a total of **120 questions** and **24 printed pages.**
- For answering a question, an ANSWER SHEET is provided separately. Please fill your Reg. No. and Paper set Properly in the space given in the ANSWER SHEET.
- Please darken the entire circle that corresponds to your answer for each question. Use only HB pencil or Ball Point Pen to mark answer, and erase pencil marks completely to make a change. Do not scribble anything on the answer sheet.

Wrong way of filling **Right way of filling**

A B C D A B C D A B C D

SAMPLE COPY

- **Full Marks 360. Total Time 3 Hrs**.
- Marking Scheme : ONLY ONE correct option and each question carries **3** Marks and **–1** will be awarded for every wrong answer. **(NEGATIVE MARKING).**

Name : _____ **Reg. No. :** _____

PART – I (Basic Aptitude)

Direction for questions 01 to 06

In each of the following questions which alternative will replace the question mark .

01. FB is to GD as PM is to ?

(A) RO (B) SP (C) RN (D) QO

02. NA is to LF as XN is to ?

(A) YS (B) VS (C) YM (D) WM

03. FH is to DF as UY is to ?

(A) SW (B) TX (C) RX (D) TW

04. KM is to OJ as VH is to ?

(A) AG (B) YF (C) ZE (D) YG

05. DI is to EE as RQ is to ?

(A) QN (B) TO (C) PP (D) SM

06. GH is to KL as PQ is to ?

(A) ST (B) TU (C) UV (D) UT

Direction for questions 07 to 11

IF MEGHA is coded as NFHIB and PEARL is coded as QFBSM , then

07. Identify the code for VIHANG

(A) WJIBOI (B) WJIOBH (C) WIJBHO (D) WJIBOH

SPACE FOR ROUGH WORK

08. Identify the code for BHOOMI.

(A) CIPQNJ (B) CINPPJ (C) CIPPNJ (D) ICPPNJ

09. Identify the code for PRABHA

(A) QSBCIB (B) QSBCBI (C) QQBCIB (D) QSBCCI

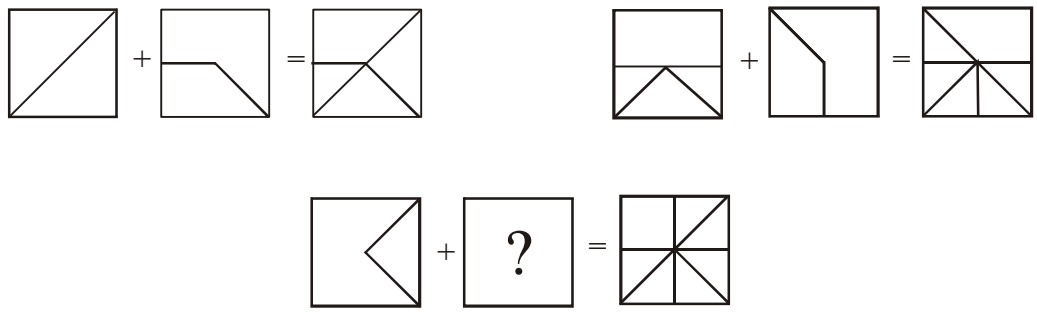
10. Identify the code for AKHILESH

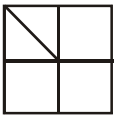
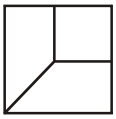
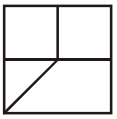
(A) BLIJMFTT (B) BLIJFMTI (C) BILJMFTI (D) BLIJMFTI

11. Identify the code for family

(A) GBNJMW (B) GBNJMZ (C) GBNMJVV (D) GBNWMJ

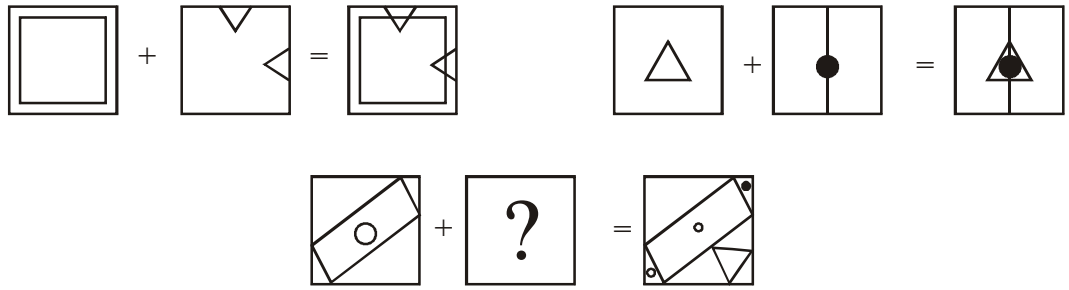
12. Observe the combined shapes and identify the missing figure in the square.

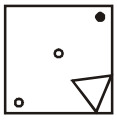


(A)  (B)  (C)  (D) 

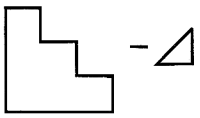
SPACE FOR ROUGH WORK

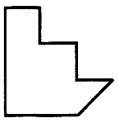
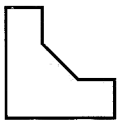
13. Observe the combined shapes and identify the missing figure in the square.



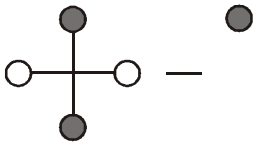
(A)  (B)  (C)  (D) 

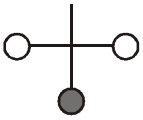
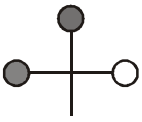
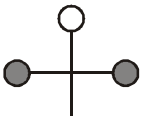
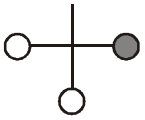
14. Identify the shape that matches the subtraction of the figures given below



(A)  (B)  (C)  (D) 

15. Identify the shape after subtraction of the given figures.



(A)  (B)  (C)  (D) 

SPACE FOR ROUGH WORK

Direction for questions 16 – 17: Abra is Rambo's daughter. Shintu is Rambo's sister. Shintu's daughter is called Cabra and son is called Dadra. Limba is Cabra's maternal Aunt.

16. Abra is limba's

(A) Aunt (B) Nephew (C) Uncle (D) None of these

17. Cabra is Rambo's

(A) Nephew (B) Niece (C) uncle (D) Cannot say

18. Deepa moved a distance of 75 metres towards the north. She then turned to the left and then turned to the right at an angle of 45^{o}. In which direction was she moving finally ?

(A) North-east (B) North-west (C) South (D) South-east

19. Johnson left for his office in his car. He drove 15 km towards north and then 10 km towards west. He then turned to the south and covered 5 km. Further, he turned to the east and moved 8 km. Finally, he turned right and drove 10 km. How far and in which direction is he from his starting point ?

(A) 2 km West (B) 5 km East (C) 3 km North (D) 6 Km South

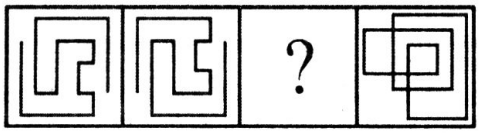
20. You go North, turn right, then right again and then go to the left. In which direction are you now ?

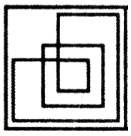
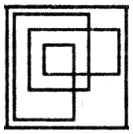
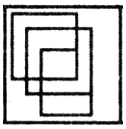
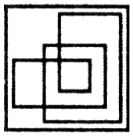
(A) North (B) South (C) East (D) West

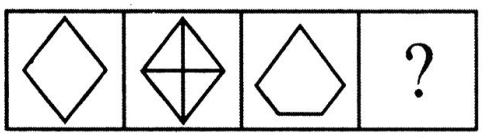
21. A man leaves for his office from his house. He walks towards East. After moving a distance of 20 m, he turns south and walks 10 m. Then he walks 35 m towards the west and further 5 m towards the north. He then turns towards east and walks 15 m. What is the straight distance (in metres) between his initial and final position ?

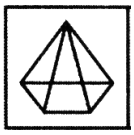
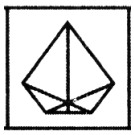
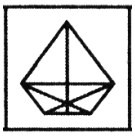
(A) 0 (B) 5 (C) 10 (D) Can't be determined

SPACE FOR ROUGH WORK

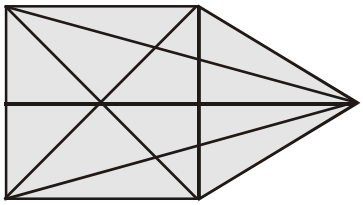
22. 

(A)  (B)  (C)  (D) 

23. 

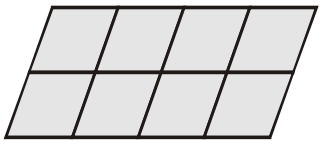
(A)  (B)  (C)  (D) 

24. What is the number of straight lines in the following figure?



(A) 10 (B) 12 (C) 13 (D) 17

25. How many parallelograms are there in the following figure?



(A) 20 (B) 24 (C) 28 (D) 30

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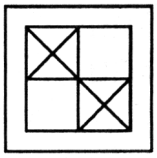
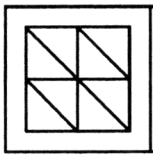
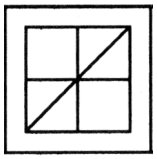
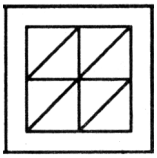
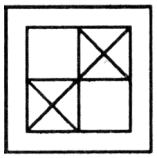
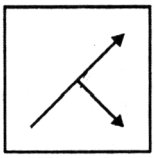
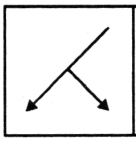
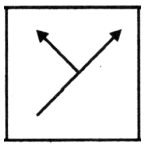
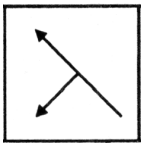
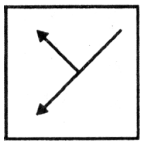
26.  has mirror image:

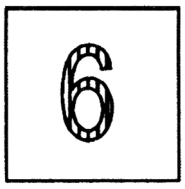
(X)

(A)  (B)  (C)  (D) 

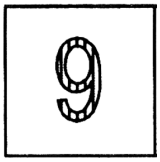
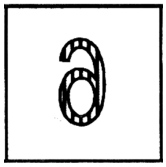
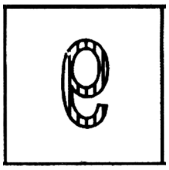
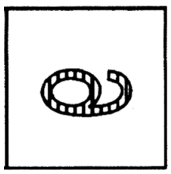
27.  has mirror image:

(X)

(A)  (B)  (C)  (D) 

28.  has mirror image:

(X)

(A)  (B)  (C)  (D) 

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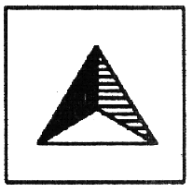
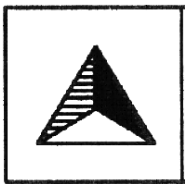
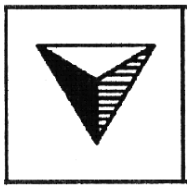
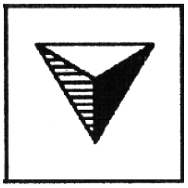
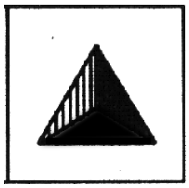
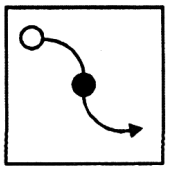
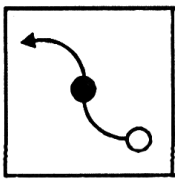
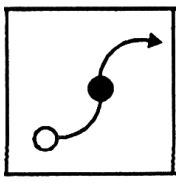
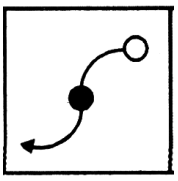
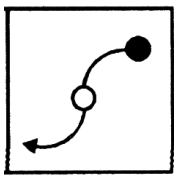
29.  has mirror image:

(X)

(A)  (B)  (C)  (D) 

30.  has mirror image:

(X)

(A)  (B)  (C)  (D) 

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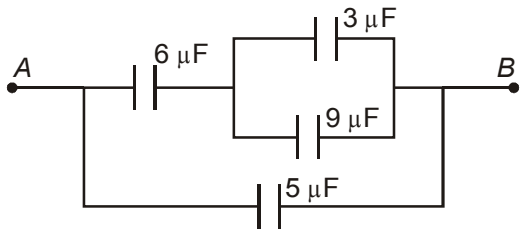
PART – II

Section - I (Physics)

31. Kinetic energy of an electron accelerated by a potential difference of 1000 V is

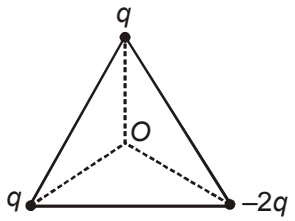
(A) 1.6×10^{-19} J (B) 1.6×10^{-16} J (C) 1.6×10^{-15} J (D) 1000 J

32. The effective capacitance of the combination between A and B is



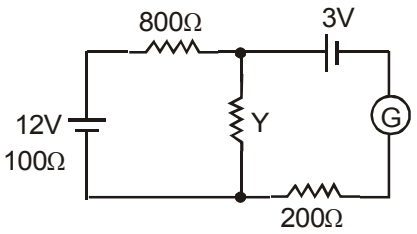
(A) 9 μ F (B) 4 μ F (C) 23 μ F (D) 12 μ F

33 Three point charges are placed at the three corners of an equilateral triangle as shown in figure. The statement which is true for net electric potential V and the net electric field intensity E at the centre of the triangle is



(A) $E = 0$, $V = 0$ (B) $V = 0$, $E \neq 0$ (C) $V \neq 0$, $E = 0$ (D) V $\neq 0$, $E \neq 0$

34. If galvanometer shows null deflection in the given figure then the value of Y is



(A) 100 Ω (B) 200 Ω (C) 300 Ω (D) 400 Ω

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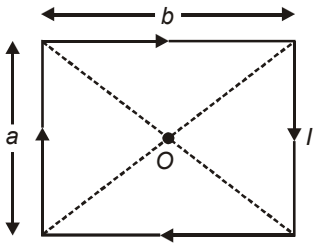
35. A rectangular loop of dimensions a and b carrying current I is shown in figure. The magnetic field at the centre O is



(A) $\frac{\mu_0 I}{\pi}\frac{\sqrt{a^2+b^2}}{ab}\otimes$ (B) $\frac{2\mu_0 I}{\pi}\frac{\sqrt{a^2+b^2}}{ab}\odot$

(C) $\frac{\mu_0 I}{2\pi}.\frac{\sqrt{a^2+b^2}}{ab}\otimes$ (D) $\frac{\mu_0 I}{2\pi}.\frac{\sqrt{a^2+b^2}}{ab}\odot$

36. A uniformly charged ring of radius R carrying charge q is rotating with angular speed ω. The magnetic field at the centre of ring is

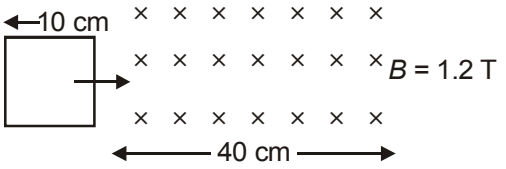
(A) $\frac{\mu_0 q\omega}{2\pi R}$ (B) $\frac{\mu_0 q\omega}{4\pi R}$ (C) $\frac{\mu_0 q\omega}{8\pi R}$ (D) Zero

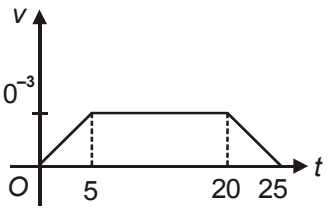
37. The magnetism of the bar magnet is due to

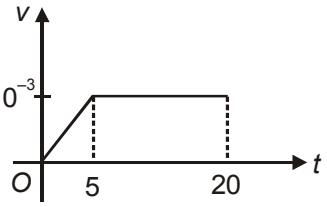
(A) Earth's magnetism (B) Cosmic rays

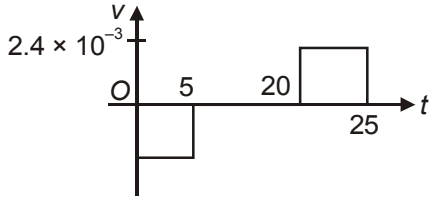
(C) The spin motion of electron (D) Pressure of big magnet inside the earth

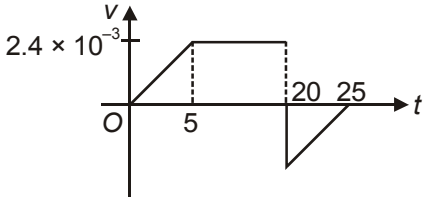
38. A square loop of side 10 cm enters a magnetic field with 2 cm/s. The front edge enters the magnetic field at $t = 0$, then which graph best depicts emf?



(A) 

(B) 

(C) 

(D) 

SPACE FOR ROUGH WORK

39. Magnification of a concave mirror

(A) Is always positive (B) Is always negative

(C) Can be positive as well as negative (D) Is always zero

40. A converging beam is incident on a convex lens of glass placed in air. The image formed is

(A) Real, erect and enlarged (B) Real, erect and diminished

(C) Virtual, erect and diminished (D) Virtual, erect and enlarged

41. The focal length of a concave lens is 50 cm, its optical power is

(A) 1 D (B) –2 D (C) 0.5 D (D) –4 D

42. A ray of light incident on an equilateral glass prism shows minimum deviation of 30°. Calculate the speed of light through the glass prism

(A) 2×10^8 m/s (B) 1×10^8 m/s (C) $\sqrt{3} \times 10^8$ m/s (D) $\frac{3}{\sqrt{2}} \times 10^8$ m/s

43. Two light beams of intensity I & $4I$ are used to interference experiment. What is the resultant intensity, when the two beams superimpose with a phase difference of p?

(A) $9I$ (B) I (C) $5I$ (D) $3I$

44. In a Young's double slit experiment, the separation between the slits is doubled and the distance between the plane of slits and screen is halved. The fringe width is

(A) Halved (B) Doubled (C) Quadrupled (D) Quartered

45. For Bohr's first orbit of circumference $2\pi r$, the de-Broglie wavelength of the revolving electron will be

(A) $2\pi r$ (B) πr (C) $\frac{1}{3\pi r}$ (D) $\frac{1}{4\pi r}$

46. For the production of characteristic K_β X-rays the electron transition is from

(A) L to K (B) M to L (C) M to K (D) N to L

SPACE FOR ROUGH WORK

47. The threshold wavelength of a photosensitive surface is λ_0. The photoelectric effect will take place only if

(A) $\lambda > \lambda_0$ (B) $\lambda < \lambda_0$ (C) $\lambda > 2\lambda_0$ (D) $\lambda > 3\lambda_0$

48. A proton and an electron are accelerated from rest by the same potential difference. If λ_e and λ_p denote the de-Broglie wavelengths of the electron and proton respectively, then

(A) $\lambda_e = \lambda_p$ (B) $\lambda_e > \lambda_p$ (C) $\lambda_e < \lambda_p$ (D) $\lambda_e = 2\lambda_p$

49. In a nuclear reaction which of the following conservation is valid?

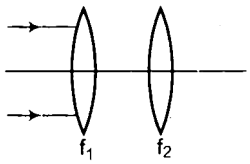
(A) Charge conservation (B) Energy-mass conservation

(C) Momentum conservation (D) All of these

50. The mass of a photon of wavelength λ is

(A) $\frac{h}{c}$ (B) $\frac{h}{\lambda c}$ (C) $\frac{hc}{\lambda}$ (D) $\frac{h\lambda}{c}$

51. Parallel beam of light is incident on the system of two convex lenses of focal lengths $f_1 = 20$ cm and $f_2 = 10$ cm. What should be the distance between the two lenses so that rays after refraction from both the lenses pass underviated:



(A) 60 cm (B) 30 cm (C) 90 cm (D) 40 m

52. Two coherent monochromatic light beams of intensities I and $4I$ are superposed. The maximum and minimum possible intensities in the resulting beam are:

(A) $5I$ and I (B) $5I$ and $3I$ (C) $9I$ and I (D) $9I$ and $3I$

53. A charge q is placed at the centre of the line joining two equal charges Q. The system of the three charges will be in equilibrium if q is equal to:

(A) $-\frac{Q}{2}$ (B) $-\frac{Q}{4}$ (C) $+\frac{Q}{4}$ (D) $+\frac{Q}{2}$

SPACE FOR ROUGH WORK

54. Power generated across a uniform wire connected across a supply is H. If the wire is cut into n equal parts and all the parts are connected in parallel across the same supply, the total popwer generated in the wire is:

(A) $\frac{H}{n^2}$ (B) n^2H (C) nH (D) $\frac{H}{n}$

55. A charged particle enters a uniform magnetic field with velocity vector at an angle of 45° with the magnetic field. The pitch of the helical path followed by the particle is p. The radius of the helix will be:

(A) $\frac{p}{\sqrt{2\pi}}$ (B) $\sqrt{2}\,p$ (C) $\frac{p}{2\pi}$ (D) $\frac{\sqrt{2}p}{\pi}$

56. Dimensions of $\frac{\text{magnetic flux}}{\text{electric flux}}$ are:

(A) $[LT^{-1}]$ (B) $[TL^{-1}]$ (C) $[L^3T^2A^{-2}]$ (D) $[M^0L^0T^0]$

57. A choke coil should have:

(A) high inductance and high resistance (B) low inductance and low resistance

(C) high inductance and low resistance (D) low inductance and high resistance

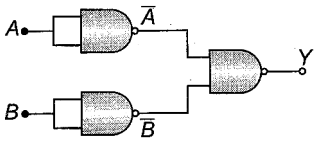
58. The ratio of contributions made by the electric field and magnetic field components to the intensity of an EM wave is:

(A) c : 1 (B) c^2 : 1 (C) 1 : 1 (D) $\sqrt{c}$: 1

59. The probability of survival of a radioactive nucleus for one mean life is:

(A) $\frac{1}{e}$ (B) $1-\frac{1}{e}$ (C) $\frac{\ln 2}{e}$ (D) $1-\frac{\ln 2}{e}$

60. The combination of the gates shown in the figure produces:

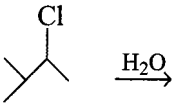


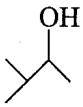
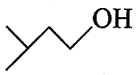
(A) NOR gate (B) OR gate (C) AND gate (D) XOR gate

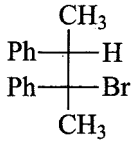
SPACE FOR ROUGH WORK

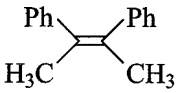
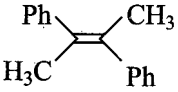
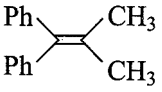
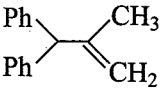
Section - II (Chemistry)

61. Find the product of the following reaction :

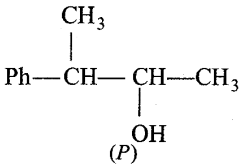


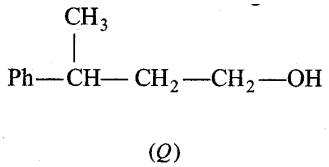
(A)  (B)  (C)  (D) 

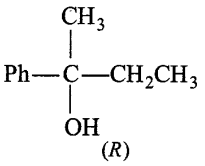
62.  major product

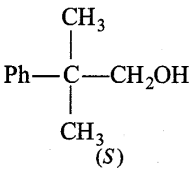
(A)  (B)  (C)  (D) 

63. The relative rate of acid catalysed dehydration of following alcohols would be :


(P)

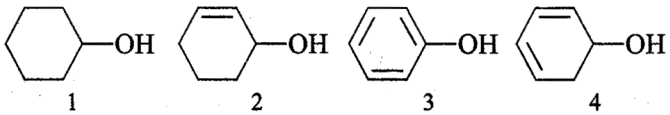

(Q)


(R)


(S)

(A) $R > P > Q > S$ (B) $R > S > P > Q$ (C) $P > R > S > Q$ (D) $R > S > Q > P$

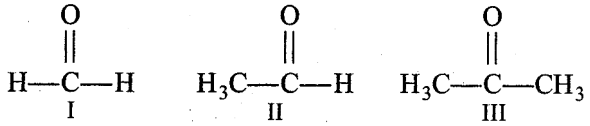
64. Dehydration of following alcohols will be in order :


1 2 3 4

(A) $1 < 2 < 3 < 4$ (B) $4 > 3 > 1 > 2$ (C) $4 > 2 > 1 > 3$ (D) $1 > 3 > 4 > 2$

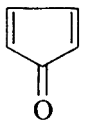
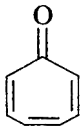
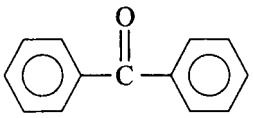
SPACE FOR ROUGH WORK

65. Mark out the correct order if dipole moment for the following compounds:

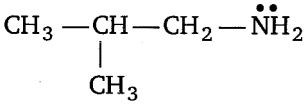
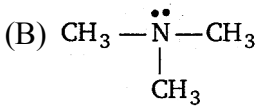


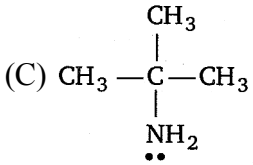
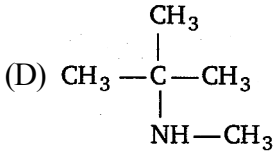
(A) I > II > III (B) II > III > I (C) III > II > I (D) III > I > II

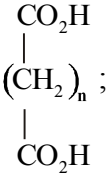
66. Which of the following carbonyl compounds when treated with dilute acid forms a stable cation ?

(A)  (B)  (C)  (D) 

67. Which of the following is a tertiary amine ?

(A)  (B) 

(C)  (D) 

68.  ; If (n = 4) , then dicarboxylic acid will be known as :

(A) Malonic Acid (B) Succinic Acid (C) Adipic Acid (D) Oxalic Acid

69. There is no S–S bond in :

(A) $S_2O_4^{2-}$ (B) $S_2O_5^{-}$ (C) $S_2O_3^{2-}$ (D) $S_2O_7^{2-}$

SPACE FOR ROUGH WORK

70. How many coulomb of electricity will be consumed when 100 mA current is passed through a solution of $AgNO_3$ for half an hour during electrolysis

(A) 108 (B) 180 (C) 1800 (D) 18000

71. Cu^+ is not stable and undergoes disproportion. E^o for Cu^+ disproportionation.

($E^o_{Cu+2/Cu+} = +0.153V$, $E^o_{Cu+/Cu} = 0.53V$)

(A) + 0.683V (B) -0.367V (C) +0.3415V (D) +0.367

72. Xenon crystallizes in face centre cubic lattice and the edge of the unit cell is 620 pm, then the radius of xenon-atom is

(A) 438.5 pm (B) 219.25 pm (C) 536.94 pm (D) 265.5 pm

73. In closest packing of A type of atoms (radius, r_A), the radius of atom B that can be fitted into octahedral void is:

(A) 0.155 r_A (B) 0.125 r_A (C) 0.414 r_A (D) 0.732 r_A

74. Osmotic pressure of blood is 7.40 atm at 27^0C. Number of mol of glucose to be used per L for an intravenous injection that is to have the same osmotic pressure as blood, is

(A) 0.3 (B) 0.2 (C) 0.1 (D) 0.4

75. With excess of Cl_2, ammonia forms :

(A) NH_4Cl (B) N_2 (C) NCl_3 (D) $NH_3 \cdot NCl_3$

76. The pair having similar magnetic moment :

(A) Ti^{3+}, V^{3+} (B) Cr^{3+}, Mn^{2+} (C) Mn^{2+}, Fe^{3+} (D) Fe^{2+}, Mn^{3+}

77. In the following reaction :

$$yMnO_4^- + xH^+ + C_2O_4^- \rightarrow yMn^{2+} + 2CO_2 + \frac{x}{2}H_2O,$$

x and y are :

(A) 2 and 16 (B) 1 6and 2 (C) 8 and 16 (D) 5 and 12

SPACE FOR ROUGH WORK

78. The number of unpaired electrons in Fe^{2+} (z =26) are :

(A) 4 (B) 5 (C) 6 (D) 3

79. If for any reaction , the rate constant is equal to the rate of the reaction at all concentration . The order is :

(A) 0 (B) 2 (C) 1 (D) 3

80. The rate of the simple reaction $2NO + O_2 \longrightarrow 2NO_2$, when the volume of the reaction vessel is doubled–

(A) will grow eight times of its initial rate (B) Rate reduce to one-eights of its initial rate

(C) will grow four times of its initial rate (D) Reduce to one-fourth of its initial rate

81. Which of the following oxyacid contains both P – H and P – P bond simultaneously ?

(A) $H_4P_2O_5$ (B) $H_4P_2O_7$ (C) $H_4P_2O_6$ (D) None

82. Which of the following compounds shows least tendency towards hydrolysis ?

(A) BF_3 (B) BCl_3 (C) BBr_3 (D) BI_3

83. The hydrolysis of Na_2SO_3 makes the solution

(A) Alkaline (B) Acidic (C) Neutral (D) None of these

84 $A + H_2O \longrightarrow B + HCl$

$B + H_2O \longrightarrow C + HCl$

Compound (A), (B) and (C) will be respectively :

(A) $PCl_5, POCl_3, H_3PO_3$ (B) $PCl_5, POCl_3, H_3PO_4$

(C) $SOCl_2, POCl_3, H_3PO_3$ (D) $PCl_3, POCl_3, H_3PO_4$

SPACE FOR ROUGH WORK

85. In the context of carbon, which of the following is arranged in the correct order of electronegativity :

(A) $sp > sp^2 > sp^3$ (B) $sp^3 > sp^2 > sp$ (C) $sp^2 > sp > sp^3$ (D) $sp^3 > sp > sp^2$

86. Among the following ions which one has the highest paramagnetism

(A) $[Cr(H_2O)_6]^{3+}$ (B) $[Fe(H_2O)_6]^{2+}$ (C) $[Cu(H_2O)_6]^{2+}$ (D) $[Zn((H_2O)_6]^{2+}$

87. Complexes $[Co(NH_3)_5SO_4]Br$ and $[Co(NH_3)_5Br]SO_4$ can be distinguished by

(A) conductance measurement (B) using $BaCl_2$

(C) using $AgNO_3$ (D) All

88. The two compounds $[Co(SO_4)(NH_3)_5]Br$ and $[Co(SO_4)(NH_3)_5]Cl$ represent:

(A) Linkage isomerism (B) Ionisation isomerism

(C) Co-ordination isomerism (D) No isomerism

89. Which ion has tetrahedral geometry:

(A) $[Fe(CO)_5]$ (B) $[Co(NH_3)_6]^{2+}$ (C) $[NiCl_4]^{2-}$ (D) $[Ni(CN)_4]^{2-}$

90. The number of donor sites in dimethyl glyoxime, glycinato, diethylene triamine and EDTA are respectively:

(A) 2, 2, 3 and 4 (B) 2, 2, 3 and 6 (C) 2, 2, 2 and 6 (D) 2, 3, 3 and 6

SPACE FOR ROUGH WORK

Section - III (Mathematics)

91. If $y = \log\left(\frac{e^x}{e^x+1}\right)$, then dy/dx equals-

(A) $\frac{1}{e^x+1}$ (B) $\frac{1}{(e^x+1)^2}$ (C) $\frac{e^x-1}{e^x+1}$ (D) None of these

92. If $x\sqrt{1+y}+y\sqrt{1+x}=0$, then $\frac{dy}{dx}$ equals-

(A) $\frac{1}{(1+x)^2}$ (B) $-\frac{1}{(1+x)^2}$ (C) $\frac{1}{1+x^2}$ (D) None of these

93. The period of $|\sin 2x|$ is -

(A) $\pi/4$ (B) $\pi/2$ (C) π (D) 2π

94. If $f(x)=\frac{x-3}{x+1}$, then $f[f\{f(x)\}]$ equals-

(A) x (B) 1/x (C) –x (D) –1/x

95. The value of $\lim_{x\to\infty}\left[\frac{(2x-3)(3x+5)(4x-6)}{3x^3+x-1}\right]$ is -

(A) 2 (B) 1 (C) 8 (D) Does not exist

96. The value of $\lim_{x\to 0}\frac{\sqrt{(1+x^2)}-\sqrt{1-x^2}}{x^2}$ is :

(A) 1 (B) 2 (C) 3 (D) Does not exist

97. The equation of tangent to the curve y = sin x at the point $(\pi,0)$ is -

(A) x + y = 0 (B) x + y = π (C) x– y = π (D) x–y = 0

SPACE FOR ROUGH WORK

98. If $f(x)=\begin{cases}\dfrac{x^3+x^2-16x+20}{(x-2)^2}, & x\neq 2\\ k, & x=2\end{cases}$ is continuous for all values of x, then the value of k is-

(A) 5 (B) 6 (C) 7 (D) 8

99. $f(x) = 2x^3 - 21x^2 + 36x + 7$ has a maxima at-

(A) x = 2 (B) x = 1 (C) x = 6 (D) x = 3

100. If x = p and x = q are respectively the maximum and minimum points of the function $x^5 - 5x^4 + 5x^3 - 10$, then-

(A) p=0, q= 1 (B) p = 1, q = 0 (C) p = 1, q = 3 (D) p = 3, q = 1

101. If $\int \frac{2x+3}{(x-1)(x^2+1)}\,dx = \log[(x-1)^{5/2}(x^2+1)^a] - \frac{1}{2}\tan^{-1}x + k$ where k is any arbitrary constant, then a is equal to

(A) 5/4 (B) –5/3 (C) –5/6 (D) –5/4

102. $\int_{-\pi/2}^{\pi/2} \frac{\cos x}{1+e^x}$ is equal to-

(A) 0 (B) 2 (C) 1 (D) None of these

103. Let f be a positive function. If

$I_1 = \int_{1-k}^{k} xf\{x(1-x)\}dx \qquad I_2 = \int_{1-k}^{k} f[x(1-x)]dx$

where $2k - 1 > 0$, then the value of I_1 / I_2 is equal to-

(A) 2 (B) k (C) 1/2 (D) 1

104. If $0 \le x \le \pi$; then the area bounded by the curve y = x and y = x + sin x is-

(A) 2 (B) 4 (C) 2π (D) 4π

105. If vectors $2\hat{i} - \hat{j} + \hat{k}$, $\hat{i} + 2\hat{j} - 3\hat{k}$ and $3\hat{i} + a\hat{j} + 5\hat{k}$ are coplanar, then the value of a is-

(A) 2 (B) – 2 (C) – 1 (D) – 4

106. If $A = \hat{i} - \hat{j} + 2\hat{k}$ and $B = 2\hat{i} + 3\hat{j} - 4\hat{k}$ then $|\overrightarrow{AB}|$ equals-

(A) $\sqrt{35}$ (B) $\sqrt{53}$ (C) $\sqrt{65}$ (D) 1

SPACE FOR ROUGH WORK

107. If P (A) $=\frac{3}{8}$, then find the odds in against of A -

(A) 3 : 5 (B) 4 : 5 (C) 3 : 4 (D) 5 : 3

108. If two dice are thrown together then what is the probability that the sum of their numbers is greater than 9.

(A) 1/2 (B) 1/4 (C) 1/6 (D) 2/6

109. If A $=\begin{bmatrix} p & q \\ -q & p \end{bmatrix}$,, B $=\begin{bmatrix} r & s \\ -s & r \end{bmatrix}$ then -

(A) AB = BA (B) AB $\neq$ BA (C) AB = – BA (D) None of these

110. $\begin{vmatrix} a & b & a\alpha+b \\ b & c & b\alpha+c \\ a\alpha+b & b\alpha+c & 0 \end{vmatrix}=0$, then a, b,c are in -

(A) A.P. (B) G.P. (C) H.P. (D) None of these

111. A plane P passes through a point P(3, – 2, 1) and is perpendicular to the vector $\vec{V}=4\hat{i}+7\hat{j}-4\hat{k}$. The distance between the plane P and the plane $\vec{r}\cdot(4\hat{i}+7\hat{j}-4\hat{k})+33=0$, equals

(A) 3 (B) 2 (C) 1 (D) $\frac{28}{9}$

112. $\int\left(3x^2\tan\frac{1}{x}-x\sec^2\frac{1}{x}\right)dx$ is equal to

(A) $x^3\cos\frac{1}{x}+c$ (B) $x^2\tan\frac{1}{x}+c$ (C) $x^3\tan\frac{1}{x}+c$ (D) $x^2\sec\frac{1}{x}+c$

113. The general solution of the different equation $\frac{dy}{dx}=e^{x-y}+x^2e^{-y}$ is

(A) $e^y=e^x+\frac{x^3}{3}+c$ (B) $e^y=e^x+2x+c$ (C) $e^y=e^x+x^3+c$ (D) None of these

SPACE FOR ROUGH WORK

114. If $P(A \cup B) = 3/4$ and $P(\overline{A}) = 2/3$ then $P(\overline{A} \cap B)$ equals -

(A) 1/12 (B) 7/12 (C) 5/12 (D) 1/2

115. $\int \frac{dx}{x\left(x^{2010}+1\right)}$ is equal to

(A) $\frac{1}{2009}\ln\left|1+x^{2010}\right|+c$ (B) $\frac{1}{2010}\ln\left|1+x^{-2010}\right|+c$

(C) $\ln\left|1+x^{2010}\right|+x+c$ (D) $-\frac{1}{2010}\ln\left|1+x^{-2010}\right|+c$

116. The order and degree of the differential equation $\left[4+\left(\frac{dy}{dx}\right)^2\right]^{2/3} = \frac{d^2y}{dx^2}$ are equal to

(A) 2,2 (B) 3,3 (C) 2,3 (D) 3,2

117. The area contained between the curve $xy = a^2$, the vertical line $x = a$, $x = 4a(a>0)$ and x-axis is

(A) $a^2 \ln 2$ (B) $2a^2 \ln 2$ (C) $a \ln 2$ (D) $2a \ln 2$

118. If the probability of solving a problem by three students are 1/2, 2/3 and 1/4 then probability that the problem will be solved-

(A) 1/2 (B) 3/4 (C) 7/8 (D) 1/8

119. A pair of dice is thrown. If 5 appears on at least one of the dice, then the probability that the sum is 10 or greater, is-

(A) 11/36 (B) 2/9 (C) 3/11 (D) 1/12

120. If $\vec{a}$ and $\vec{b}$ are two vectors such that $|\vec{a}|=1$, $|\vec{b}|=4$, $\vec{a}\cdot\vec{b}=2$. If $\vec{c}=(2\vec{a}\times\vec{b})-3\vec{b}$ then angle between $\vec{b}$ and $\vec{c}$ is

(A) $\frac{\pi}{6}$ (B) $\frac{\pi}{3}$ (C) $\frac{2\pi}{3}$ (D) $\frac{5\pi}{6}$

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SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

ANSWER KEY

Course VI

Class XII Appeared/Passed Students

PART - I	PART - II		
	Section - I	Section - II	Section - III
01. D	31. B	61. A	91. A
02. B	32. A	62. B	92. B
03. A	33. B	63. A	93. B
04. C	34. C	64. C	94. A
05. D	35. A	65. C	95. C
06. B	36. B	66. C	96. A
07. D	37. C	67. B	97. B
08. C	38. C	68. C	98. C
09. A	39. C	69. D	99. B
10. D	40. B	70. B	100. C
11. B	41. B	71. D	101. D
12. D	42. D	72. B	102. C
13. C	43. B	73. C	103. C
14. A	44. D	74. A	104. A
15. A	45. A	75. C	105. D
16. D	46. C	76. C	106. B
17. B	47. B	77. B	107. D
18. D	48. B	78. A	108. C
19. A	49. D	79. A	109. A
20. C	50. B	80. B	110. B
21. B	51. B	81. D	111. A
22. D	52. B	82. A	112. C
23. D	53. B	83. A	113. A
24. D	54. B	84. B	114. C
25. B	55. C	85. A	115. D
26. D	56. B	86. B	116. C
27. C	57. C	87. D	117. B
28. B	58. C	88. D	118. C
29. A	59. A	89. C	119. C
30. C	60. B	90. B	120. D