



### Class 9<sup>th</sup>

Total Questions : 120

Maximum Marks : 480

Time : 3 Hrs.

### PAPER PATTERN & MARKING SCHEME

Subject	Reasoning		Physics		Chemistry		Biology	Maths	
	SCQ	INT	SCQ	INT	SCQ	INT	SCQ	SCQ	INT
Question type	SCQ	INT	SCQ	INT	SCQ	INT	SCQ	SCQ	INT
No. of ques	20	10	10	5	10	5	15	30	15
Marks per ques.	4	4	4	4	4	4	4	4	4
Negative marks per ques.	1	0	1	0	1	0	1	1	0

SCQ - Single correct answer type questions & INT - Integer answer type questions

#### INSTRUCTIONS – 1:

- The question paper consists of **5 parts (1. Reasoning & Mental ability 2. Physics 3. Chemistry 4. Biology 5. Mathematics)**. Please fill the **OMR** answer Sheet accordingly and carefully.
- This questions paper contains **85 single correct type questions** and **35 Integer answer type questions**.
- Please ensure that the Question Paper you have received contains All the questions in each Section and Pages. If you found some mistake like missing questions or pages then contact immediately to the Invigilator.

#### INSTRUCTIONS – 2:

- Part – 1 contains **20 Single correct type questions** and **10 Integer type questions**.
- Part – 2 and 3 contains **10 Single correct type questions** and **5 Integer type questions**.
- Part – 4 contains **15 Single correct type questions**.
- Part – 5 contains **30 Single correct type questions** and **15 Integer type questions**.
- Indicate the correct answer for each question by filling appropriate bubble in your answer sheet.
- Use of Calculator, Log Table, Slide Rule and Mobile is not allowed.

**OMR filling instructions for SCQ.**

**OMR filling instructions for INT.**

**INSTRUCTIONS**

- "Think before your ink".
- Marking should be done with Blue/Black Ball Point Pen only.
- Darken only one circle for each question as shown in Example Below.

<b>WRONG METHODS</b>	<b>CORRECT METHOD</b>

- If more than one circle is darkened or if the response is marked in any other way as shown "WRONG" above, it shall be treated as wrong way of marking.
- Make the marks only in the spaces provided.
- Carefully tear off the duplicate copy of the OMR without tampering the Original.
- Please do not make any stray marks on the answer sheet.

<b>Q. 1</b>	<b>Q. 2</b>
4 7	0 5
<input type="radio"/> 0 <input type="radio"/> 0	<input checked="" type="radio"/> 0 <input type="radio"/> 0
<input type="radio"/> 1 <input type="radio"/> 1	<input type="radio"/> 1 <input type="radio"/> 1
<input type="radio"/> 2 <input type="radio"/> 2	<input type="radio"/> 2 <input type="radio"/> 2
<input type="radio"/> 3 <input type="radio"/> 3	<input type="radio"/> 3 <input type="radio"/> 3
<input checked="" type="radio"/> 4 <input type="radio"/> 4	<input type="radio"/> 4 <input type="radio"/> 4
<input type="radio"/> 5 <input type="radio"/> 5	<input type="radio"/> 5 <input checked="" type="radio"/> 5
<input type="radio"/> 6 <input type="radio"/> 6	<input type="radio"/> 6 <input type="radio"/> 6
<input type="radio"/> 7 <input checked="" type="radio"/> 7	<input type="radio"/> 7 <input type="radio"/> 7
<input type="radio"/> 8 <input type="radio"/> 8	<input type="radio"/> 8 <input type="radio"/> 8
<input type="radio"/> 9 <input type="radio"/> 9	<input type="radio"/> 9 <input type="radio"/> 9

### MATRIX OLYMPIAD FOUNDATION

Office : Piprali Road, Sikar (Raj.) | Ph. 01572-241911

Website : [www.mof.matrixedu.in](http://www.mof.matrixedu.in) ; Email : [info@matrixedu.in](mailto:info@matrixedu.in)

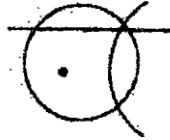


**Part – 1 contains 20 Single correct type questions and 10 Integer type questions.**

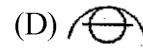
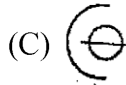
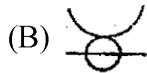
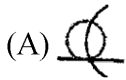
**Question No. 1 – 20 are of Single Correct Answer Type Question.**

**Four options are given in each question out of which only one option is correct.**

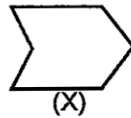
1. In the following question a dot is placed in the figure marked as (X), this figure is followed by four alternatives marked as (A), (B), (C) and (D). One out of these four options contains the common region to circle, similar to that of marked by dot in figure (X). Select that option.



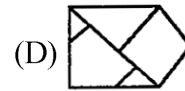
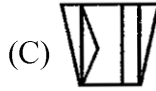
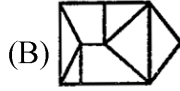
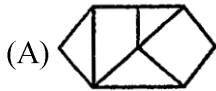
(X)



2. In the following question, choose the alternative figure in which the question figure (X) is embedded.



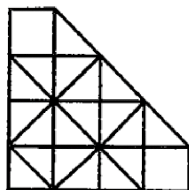
(X)



*Space for Rough Work*

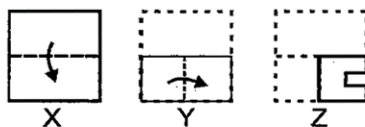


3. How many squares are there in the following figure ?



- (A) 18                      (B) 15                      (C) 13                      (D) 12

4. A sheet has been folded in the manner as shown in X, Y and Z respectively and punched. You have to choose from the alternatives how it will look when unfolded.

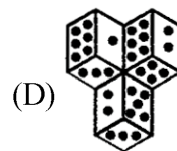
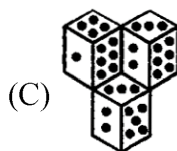
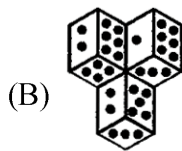
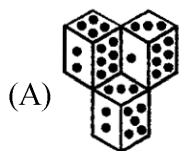


- (A)       (B)       (C)       (D) 

*Space for Rough Work*



5. In the following question, choose the correct water-image from alternatives A, B, C and D of the word / figure (X).



6. In the following a question is followed by two statements marked I and II. Decide which of the statements are sufficient to answer the question choose your answer from the given alternatives.

**What is Mohan's age ?**

**Statement I :** In 15 years Mohan will be twice as old as Ram would be.

**Statements II :** Ram was born 5 years ago.

- (A) Only I is sufficient. (B) Only II is sufficient.  
 (C) Both I and II are required. (D) Both I and II are not sufficient.

---

*Space for Rough Work*





**Directions (11 – 12) :** Study the following information carefully and answer the questions given below it :

There are five friends A, B, C, D and E. Two of them are businessmen while the other three belong to different occupations viz. medical, engineer and legal. One businessman and the lawyer stay in the same locality S, while the other three stay in three different localities P, Q and R. Two of these five persons are Hindus while the remaining three come from three different communities viz. Muslim, Christian and Shikh. The lawyer is the oldest in age while one of the businessmen who runs a factory is the youngest. The other businessman is a cloth merchant and age wise lies between the doctor and the lawyer. D is a cloth merchant and stay in locality S while E is a Muslim and stay in locality R. The doctor is a christian and stays in locality P, B is a Shikh while A is a Hindu and runs a factory.

11. Who stays in locality Q ?

- (A) A                      (B) B                      (C) C                      (D) E

12. What is E's occupation ?

- (A) Business              (B) Engineer              (C) Lawyer              (D) Doctor

---

*Space for Rough Work*



**Directions (13 – 14) :** Read the following information carefully and answer the questions given below. There are six children playing football namely A, B, C, D, E and F. A and E are brother. F is the sister of E. C is the only son of A's uncle. B and D are the daughter of C's father.

13. How is C related to F ?  
(A) Cousin                      (B) Brother                      (C) Son                      (D) Uncle
14. How many male players are there ?  
(A) One                      (B) Three                      (C) Five                      (D) Six
15. In the following question, three sequences of letter/numbers are given which correspond to each other in some way. In given question, you have to find out the letter/numerals that come in the vacant places marked by (?). These are given as one of the four alternative under the question. Mark your answer as instructed.
- \_ A C \_ B D \_ C D C D  
2 \_ 4 1 \_ 1 4 \_ \_ \_ \_  
r s \_ q r \_ p ? ? ? ?
- (A) p q p q                      (B) p r p r                      (C) r q r q                      (D) r s r s

---

*Space for Rough Work*



16. In the following question, there are two terms to the left of the sign :: which are related in some way. Obtain the same relationship between the term to the right of the sign :: from one of the four alternatives given under it.

DGOT : JKUX :: FINP : ?

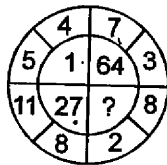
(A) KMTU

(B) LNTS

(C) LMTT

(D) MNTU

17. Find the missing number.



(A) 125

(B) 216

(C) 121

(D) 225

---

*Space for Rough Work*





**Directions (18 – 19) :** Study the information carefully and then choose the correct alternative to answer the questions.

Five friends A, B, C, D and E are sitting on a bench.

- (i) A is sitting next to B.
- (ii) C is sitting next to D.
- (iii) D is not sitting with E.
- (iv) E is on the left end of the bench.
- (v) C is on second position from the right.
- (vi) A is on the right side of B and to the right side of E.
- (vii) A and C are sitting together.

18. Where is A sitting ?

- (A) Between B and D
- (B) Between D and C
- (C) Between C and E
- (D) Between B and C

19. C is sitting between

- (A) B and D
- (B) A and E
- (C) D and E
- (D) A and D

20. Find the missing term :

65, 48, 64, 49, 63, ?

- (A) 51
- (B) 49
- (C) 50
- (D) 62

---

*Space for Rough Work*



**Question No. 21 – 30 are of Integer Answer Type Question.**

Answer of these question will come from **00** to **99**.

21. Choose the correct alternative.

$$3 : 11 :: 7 : ?$$

22. Insert missing number

17	11	19
12	13	16
25	4	?

23. If LACK is written as 396 then BACK is written as -

24. Raj travelled from a point X straight to Y at a distance of 80 metres. He turned right and walked 50 metres, then again turned right and walked 70 metres. Finally, he turned right and walked 50 metres. How far is he from the starting point?

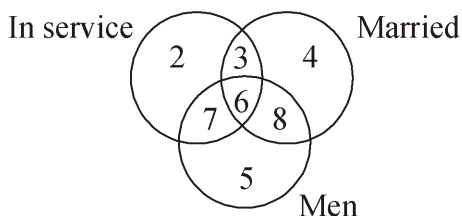
25. If  $54/32 = 4$ ,  $36/42 = 3$ ,  $92/22 = 7$  then what is  $28/33 = ?$

---

*Space for Rough Work*



26. In a row of trees, a lemon tree is eight from the either end of the row. How many lemon trees are there in total in the row ?
27. If 25<sup>th</sup> August in a year is Thursday, then number of Mondays in that month is
28. How many times are the hands of a clocks perpendicular in a day?
29. In the above diagram the number of men who are married and in service is :



30. The position of how many letters in the word BRAKES remains unchanged when they are arranged in alphabetical order?

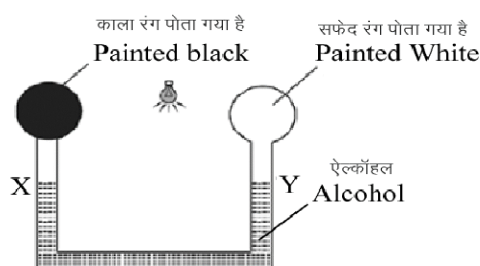
---

*Space for Rough Work*





33. The figure shows air-filled bulbs connected by a U-tube partly filled with alcohol. What happens to the levels of alcohol in the limbs X and Y when an electric bulb placed midway between the bulbs is lighted?

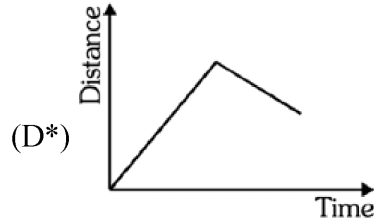
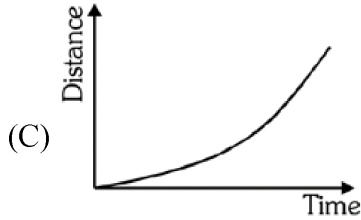
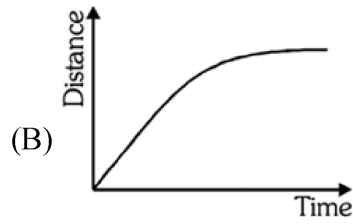
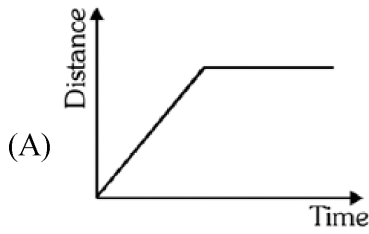


- (A) The level of alcohol falls in both limbs.  
(B) The level of alcohol in the limb X rises while that in limb Y falls.  
(C) The level of alcohol in limb X falls while that in limb Y rises.  
(D) There is no change in the levels of alcohol in the two limbs.
34. A car moves with a speed of  $60 \text{ km h}^{-1}$  for 20 min and then at a speed of  $30 \text{ km h}^{-1}$  for the next 20 min. The total distance covered by the car is
- (A) 10 km                      (B) 20 km                      (C) 30 km                      (D) 40 km

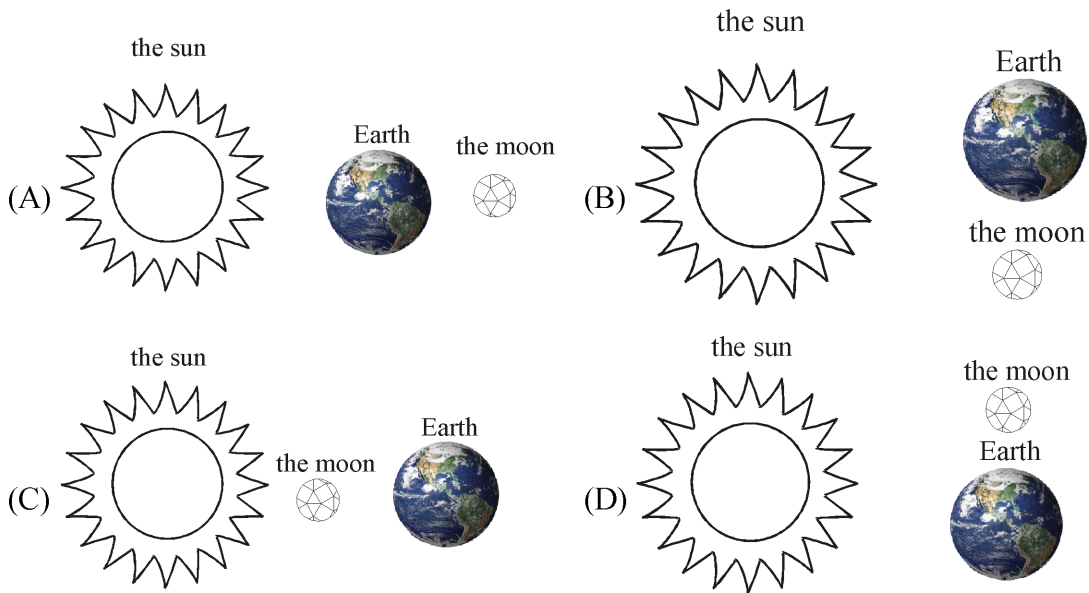
*Space for Rough Work*



35. Which of the following distance–time graphs is not possible ?



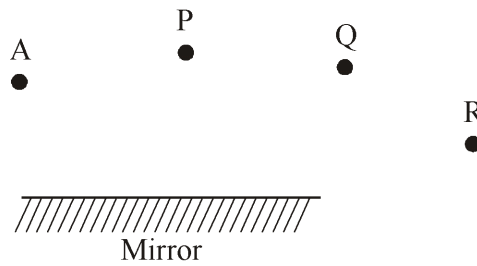
36. Which diagram shows the relative positions of Earth, the Moon and the Sun during a lunar eclipse?



*Space for Rough Work*

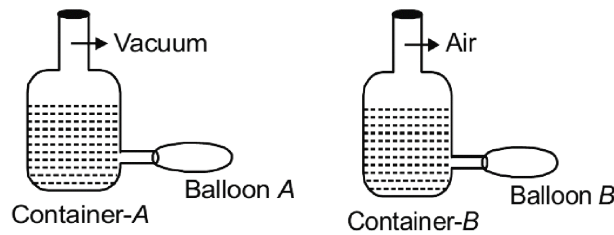


37. Sunil stands at A just on the side of a plane mirror as shown in figure. He can see image of object/s situated at



- (A) P only                      (B) P and Q                      (C) Q only                      (D) Q and R

38. Water is filled upto same height in two identical closed containers A and B. Container A has vacuum over the water while container B has air over the water. At the same depth of both the containers there is an opening in which identical balloons A and B are attached as shown in the figure given below. Then

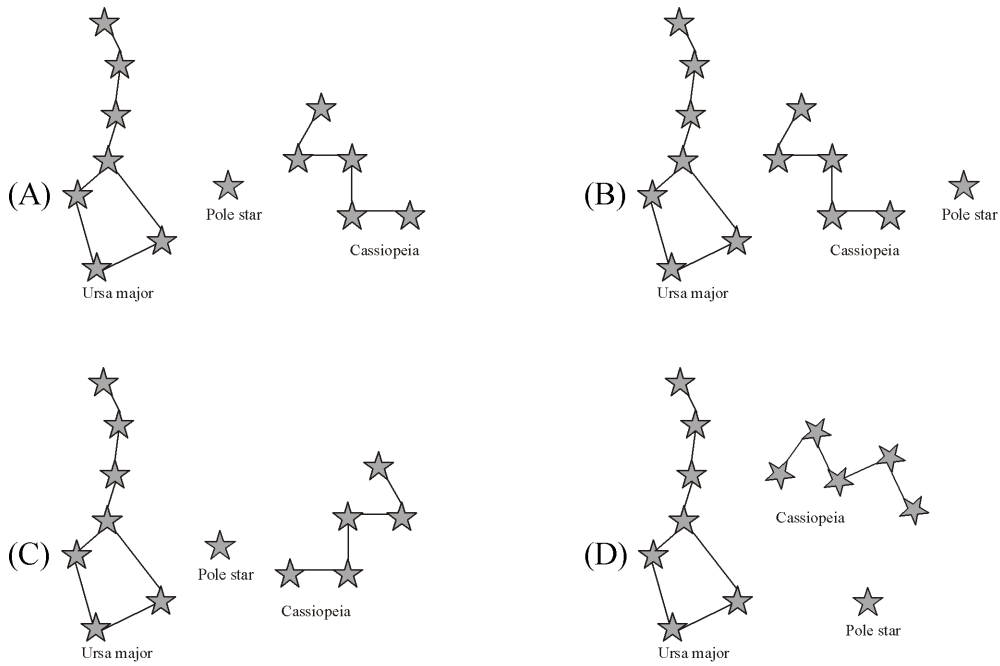


- (A) Balloon-A will bulge more than balloon-B  
(B) Balloon-B will bulge more than balloon-A  
(C) Both the balloons will bulge equally  
(D) None of the balloons will bulge

*Space for Rough Work*



39. Try to locate Ursa major and Cassiopeia using the Pole star on a clear night sky. Choose the correct orientation of these constellations with respect to the Pole star that you observe on the night sky.

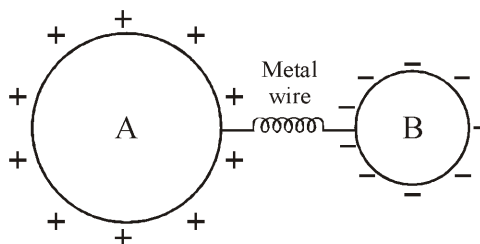


*Space for Rough Work*





40. The following diagram shows two charged conductors A and B joined by a metallic wire :



If A is positively charged and B is negatively charged, state :

The direction of flow of electric current :

- (A) The direction of flow of electric current from A to B
- (B) The direction of flow of electric current from B to A
- (C) Cannot be predicted
- (D) Will not flow

---

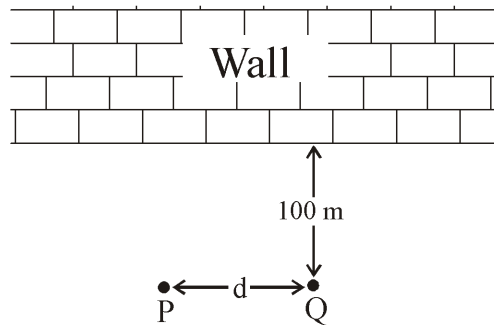
*Space for Rough Work*



**Question No. 41 – 45 are of Integer Answer Type Question.**

Answer of these question will come from **00** to **99**.

41. The mass of your car is 1500 kg. It is initially moving with a velocity of 30 m/s, and then withing a time duration of 50 sec, it moves with a velocity of 80 m/s. Calculate the force produced by your car :
42. Two persons P and Q are standing at a distance of 100 m from a high wall as shown in the given figure. When P gives a clap the time interval between the two (direct and reflected) sound heard by Q is 0.2 s. If the speed of sound is  $340 \text{ ms}^{-1}$  then the distance  $d$  between P and Q is :



*Space for Rough Work*



43. After jumping out from the plane, a parachutist falls 80 m without friction. When he opens up the parachute, he decelerates at  $2 \text{ m s}^{-2}$ . He reaches the ground with a speed of  $4 \text{ m s}^{-1}$ . How long did the parachutist spend his time in the air? (Take  $g = 10 \text{ m s}^{-2}$ )
44. A mass of  $M \text{ kg}$  is suspended by a weightless string. The horizontal force that is required to displace it until the string making an angle of  $45^\circ$  with the initial vertical direction is :
45. Two blocks made of different metals identical in shape and size are acted upon by equal forces which cause them to slide on a horizontal surface. The acceleration of the block by equal forces which cause them to slide on a horizontal surface . The acceleration of the second block is found to be 10 times that of the first. What is the ratio of the mass of the second to the first?

---

*Space for Rough Work*



**Part – 3 contains 10 Single correct type questions and 5 Integer type questions.**

**Question No. 46 – 55 are of Single Correct Answer Type Question.**

**Question No. 56 – 60 are of Integer Answer Type Question.**

46. To identify the type of plastic a specific number is plastic products -  
This number represent  
(A) Durability of plastic product  
(B) Electrical Conductivity of plastic product  
(C) Thermal resistance of plastic product  
(D) Recycling of plastic product
47. Which is the strong fibre among the following ?  
(A) Rayon                      (B) Nylon                      (C) Acrylic                      (D) Cotton
48. Non stick cookwares have the coating of -  
(A) PET                      (B) Teflon                      (C) Acrylic                      (D) Melamine
49.  $2P + X \rightarrow P_2S_5$   
(A) 5S                      (B) 3S                      (C) 2S                      (D) S
50. **Column-I**                      **Column-II**  
(P) Aircrafts                      1. Stainless steel  
(Q) Utensils                      2. Bronze  
(R) Medals                      3. Magnalium  
(S) Balance beam                      4. Duralumin  
(A) P-3, Q-4, R-2, S-1                      (B) P-3, Q-1, R-2, S-4  
(C) P-4, Q-1, R-2, S-3                      (D) P-4, Q-3, R-1, S-2

*Space for Rough Work*



51. The substance added to detect the leakage of LPG is -  
(A) Methyl mercaptan (B) Ethyl mercaptan  
(C) Both (A) and (B) (D) None of the se
52. Main constituents of Coal gas are -  
(A)  $H_2O$ ,  $C_2H_6$ ,  $O_2$  (B)  $CH_4$ ,  $CO_2$ ,  $O_2$   
(C)  $CH_4$ ,  $H_2$ ,  $CO$  (D)  $C_2$ ,  $H_6$ ,  $N_2$ ,  $O_2$
53. When a frying pan containing cooking oil is kept for long on a burning stove then cooking oil catches fire because -  
(A) Its temperature is lower than its ignition temperature  
(B) Its temperature is reached to its ignition temperature  
(C) Its temperature is lower than critical temperature  
(D) Its temperature is higher than critical temperature
54. The gas that causes Global warming -  
(A) Carbon monoxide (B) Sulphur dioxide  
(C) oxygen (D) Carbon dioxide
55. Efficiency of a fuel is determined by its -  
(A) Ignition temperature (B) Calorific value]  
(C) Production of light (D) Duration of burning

---

*Space for Rough Work*



**Question No. 56 – 60 are of Integer Answer Type Question.**

Answer of these question will come from **00** to **99**.

56. The number of valence electron in  $\text{Cl}^-$  ion are ?
57. How many of following are biodegradable wastes ?
58. The following are metalloid ?  
Boron, Silicon, Barium, Bismuth, Beryllium.
59. How many non metals are included in the reactivity serices of metals ?
60. How are renewable secures ?

---

*Space for Rough Work*



**Part – 4 contains 15 Single correct type questions.**

**Question No. 61 – 75 are of Single Correct Answer Type Question.**

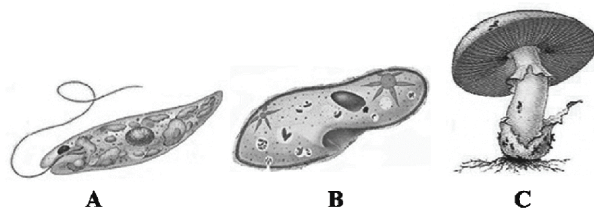
61. Who proposed the theory that "Cells arise only from the pre-existing cells"?
- (A) Mohl (B) Virchow  
(C) Haeckel (D) Brown
62. An organelle devoid of membrane covering is
- (A) Vacuole (B) Ribosome  
(C) Peroxisome (d) Lysosome
63. Match column-I with column-II and choose the correct option.
- | <b>Column-I</b>        | <b>Column-II</b>                |
|------------------------|---------------------------------|
| A. Tonoplast           | I. Contain digestive enzyme     |
| B. Contractile vacuole | II. Store metabolic gases       |
| C. Food vacuole        | III. Excretion                  |
| D. Air vacuole         | IV. Transport of ions in plants |
- (A) A – IV; B – III; C – I; D – II (B) A – II; B – III; C – IV; D – I  
(C) A – IV; B – II; C – III; D – I (D) A – I; B – III; C – II; D – IV
64. Which of the following characteristic(s) is/are used by Whittaker for the classification of organisms ?
- (A) Mode of nutrition (B) Thallus organisation  
(C) Phylogenetic relationships (D) All of the above

---

*Space for Rough Work*



65. The genetic material of virus includes  
(A) only RNA (B) only DNA  
(C) RNA and DNA both (D) RNA or DNA, i.e., one nucleic acid in a virus
66. Identify the figures A, B and C given below.



- (A) A – Euglena, B – Paramecium, C – Agaricus  
(B) A – Euglena, B – Planaria, C – Agaricus  
(C) A – Planaria, B – Paramecium, C – Agaricus  
(D) A – Euglena, B – Paramecium, C – Aspergillus
67. The natural system of classification for flowering plants was given by  
(A) Carolus Linnaeus (B) Bentham and Hooker  
(C) Engler and Prantl (D) R. H. Whittaker

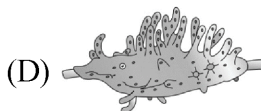
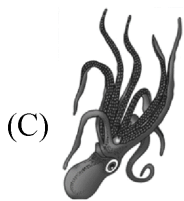
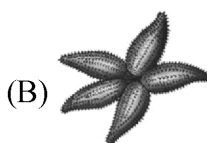
---

*Space for Rough Work*





68. Phylogenetic classification system is based on the
- (A) Morphological characters of various organisms.
  - (B) Anatomical characters of various organisms.
  - (C) Physiological characters of various organisms.
  - (D) Evolutionary relationships between the various organisms.
69. Cytological information like chromosome number, structure, behaviour are related with
- (A) Numerical taxonomy
  - (B) Cytotaxonomy
  - (C) Chemotaxonomy
  - (D) All of these
70. Which of the following animal's body is covered by calcareous shell and unsegmented with a distinct head, muscular foot, and visceral hump?



---

*Space for Rough Work*



71. Match the types of animals given in column I with their examples given in column II and choose the correct option.

**Column -I****(Types of animals)**

A. Limbless reptiles

B. Jawless vertebrates

C. Flightless bird

D. Largest terrestrial animal

E. Limbless amphibia

(A) A – II; B – V; C – IV; D – I; E – III

(C) A – V; B – II; C – I; D – IV; E – III

**Column -II****(Examples)**

I. Elephant

II. Lamprey

III. Ichthyophis

IV. Ostrich

V. Cobra

(B) A – V; B – II; C – IV; D – I; E – III

(D) A – V; B – IV; C – II; D – I; E – III

72. When any plane passing through the central axis of the body divides the organism into two identical halves, the organism is called \_\_\_\_\_.

(A) Radially symmetrical

(B) Bilaterally symmetrical

(C) Asymmetrical

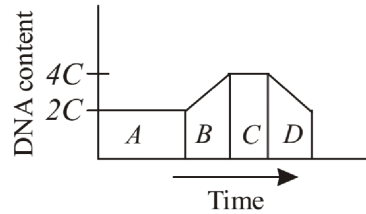
(D) Metamerically segmented

---

*Space for Rough Work*



73. In cell cycle, DNA replication takes place in \_\_\_\_\_  
(A)  $G_1$  phase (B)  $G_2$  phase  
(C) Mitotic metaphase (D) S phase
74. Identify the phases from the graph given below that shows the change in DNA content during various phases (A to D) of mitotic cell cycle.



(A) 

A	B	C	D
$G_2$	$G_1$	S	M

(B) 

A	B	C	D
$G_2$	S	$G_1$	M

(C) 

A	B	C	D
$G_1$	S	$G_2$	M

(D) 

A	B	C	D
M	$G_1$	S	$G_2$

75. Which of the following disease is confirmed by 'widal test'?
- (A) Tuberculosis (B) Typhoid  
(C) Plague (D) Tetanus

*Space for Rough Work*



**Part – 1 contains 30 Single correct type questions and 15 Integer type questions.**

**Question No. 76 – 105 are of Single Correct Answer Type Question.**

**Question No. 106 – 120 are of Integer Answer Type Question.**

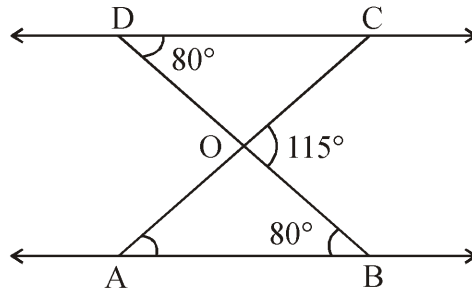
76. If  $h, s, V$  be the height, curved surface area and volume of a cone respectively, then  $(3\pi Vh^3 + 9V^2 - s^2h^2)$  is equal to :
- (A) 0                      (B)  $\pi$                       (C)  $\frac{V}{sh}$                       (D)  $\frac{36}{V}$
77. If  $\sqrt[3]{75} = \sqrt[3]{45} = \sqrt[3]{15} = a$ , then which of the statement is true
- (A)  $x + y = 2z$               (B)  $x + y = 3z$               (C)  $x - y = 2z$               (D)  $x - y = 3z$
78. X and Y are two cylinder of the same height. The base of X has diameter that is half the diameter of the base of Y. If the height of X is doubled, the volume of X becomes :
- (A) equal to the volume of Y                      (B) double the volume of Y  
(C) half the volume of Y                      (D) greater than the volume of Y
79. If  $a + b + c = 6$ , the value of  $(2 - a)^3 + (2 - b)^3 + (2 - c)^3 - 3(2 - a)(2 - b)(2 - c)$  is.
- (A) 1                      (B) 0                      (C) -1                      (D) 2
80. The chance that a leap year contains 53 sundays is :
- (A)  $\frac{1}{7}$                       (B)  $\frac{3}{7}$                       (C)  $\frac{2}{7}$                       (D)  $\frac{1}{365}$
81. L.C.M. of  $x^3 + x^2 + x + 1$  and  $x^3 - x^2 + x - 1$  is :
- (A)  $x^4 + 1$               (B)  $x^4 - 1$               (C)  $x^2 + 1$               (D)  $x^2 - 1$

---

*Space for Rough Work*

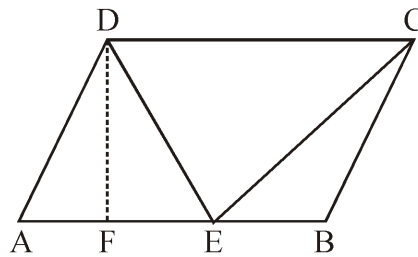


82. In the given figure,  $\triangle ODC \sim \triangle OBA$ ,  $\angle BOC = 115^\circ$  and  $\angle CDO = 80^\circ$ . Then  $\angle OAB$  is equal to



- (A)  $80^\circ$                       (B)  $35^\circ$                       (C)  $45^\circ$                       (D)  $65^\circ$

83. ABCD is a parallelogram  $\triangle DEC$  is drawn such that  $BE = \frac{1}{3} AE$ . Sum of the areas of  $\triangle ADE$  and  $\triangle BEC$  is :



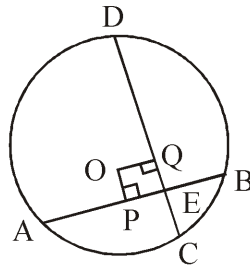
- (A)  $\frac{1}{3}$  area of parallelogram ABCD                      (B)  $\frac{1}{2}$  area of parallelogram ABCD  
(C)  $\frac{2}{3}$  area of  $\triangle DEC$                                       (D)  $\frac{1}{2}$  area of  $\triangle DEC$

---

*Space for Rough Work*



84. In the diagram O is the centre of a circle.  $AE + EB = CE + ED$ .  $OP \perp AB$  and  $OQ \perp CD$ , then true relation between OP and OQ is :



- (A)  $OP > OQ$       (B)  $OP < OQ$       (C)  $OP = \frac{1}{2}OQ$       (D)  $OP = OQ$
85. A die is thrown twice. The probability that 5 will not come up either of the time is.
- (A)  $\frac{35}{36}$       (B)  $\frac{25}{36}$       (C)  $\frac{1}{36}$       (D)  $\frac{11}{36}$
86. A piece of wire 60 cm long is cut into two parts, one of them being 24 cm long. Each part is then bent to form a square. The ratio of the area of the larger to the smaller square is :
- (A)  $\frac{9}{4}$       (B)  $\frac{7}{4}$       (C)  $\frac{3}{2}$       (D)  $\frac{11}{3}$

---

*Space for Rough Work*



87. The number which is neither prime nor composite is -  
(A) 3 (B) 1 (C) 2 (D) 5
88. How many pairs of  $x$  and  $y$  satisfy the equations  $2x + 4y = 8$  and  $6x + 12y = 24$  ?  
(A) 0 (B) 1 (C) Infinite (D) none of these
89.  $f(x) = 3x^5 + 11x^4 + 90x^2 - 19x + 53$  is divided by  $x + 5$  then the remainder is \_\_\_\_  
(A) 100 (B) -100 (C) -102 (D) 102
90. If the mode of the observation 4, 2, 3, 3, 3, 2, 2, 4, 2, 4,  $x$ , 3, 4, 4, 2, 3, 4 is 4 then  $x$  cannot be -  
(A) 2 (B) 4 (C) 3 (D) Both (A) & (C)
91. Three letters, to each of which corresponds an addressed envelope are placed in the envelopes at random. The probability that all letters are placed in the right envelopes is -  
(A)  $\frac{1}{3}$  (B) 1 (C)  $\frac{1}{6}$  (D) 0
92. The value of  $4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{2 + \frac{1}{4}}}}$  is -  
(A)  $\frac{40}{31}$  (B)  $\frac{4}{9}$  (C)  $\frac{1}{8}$  (D)  $\frac{31}{40}$

---

*Space for Rough Work*



93. A cylinder 6 cm in diameter is partially filled with water. A sphere 3 cm in diameter is gently dropped into the cylinder. To what further height will the water in the cylinder rise ?  
(A) 6 cm                      (B) 2 cm                      (C) 1/2 cm                      (D) None of these
94. If  $(x - 3)$  is the factor of  $3x^3 - x^2 + px + q$  then \_\_\_\_\_  
(A)  $p + q = 72$               (B)  $3p + q = 72$               (C)  $3p + q = -72$               (D)  $q - 3p = 72$
95. If B lies between A and C,  $AC = 15$  cm and  $BC = 9$  cm then  $AB^2$  is :-  
(A) 306                      (B) 144                      (C) 36                      (D) 24
96. This question has two matching lists. Choices for the correct combination of elements from Column-I and Column-II are given as options (A), (B), (C) and (D) out of which one is correct.

**Column I****Column II**

(P)  $(3^2 + 2^2) \times \left(\frac{1}{2}\right)^3$

(i)  $\frac{19}{64}$

(Q)  $(3^2 + 2^2) \times \left(\frac{2}{3}\right)^{-3}$

(ii)  $-\frac{4}{3}$

(R)  $\left[\left(\frac{1}{3}\right)^{-3} - \left(\frac{1}{2}\right)^{-3}\right] \div \left[\frac{1}{4}\right]^{-3}$

(iii)  $\frac{13}{8}$

(S)  $(2^2 + 3^2 - 4^2) \div \left(\frac{3}{2}\right)^2$

(iv)  $\frac{351}{8}$

(A) (P)  $\rightarrow$  (i), (Q)  $\rightarrow$  (ii), (R)  $\rightarrow$  (iii), (S)  $\rightarrow$  (iv)

(B) (P)  $\rightarrow$  (iv), (Q)  $\rightarrow$  (i), (R)  $\rightarrow$  (ii), (S)  $\rightarrow$  (iii)

(C) (P)  $\rightarrow$  (iii), (Q)  $\rightarrow$  (iv), (R)  $\rightarrow$  (i), (S)  $\rightarrow$  (ii)

(D) (P)  $\rightarrow$  (iv), (Q)  $\rightarrow$  (ii), (R)  $\rightarrow$  (iii), (S)  $\rightarrow$  (i)

*Space for Rough Work*





97.  $\sqrt{(3.6\% \text{ of } 40)}$  is equal to :  
(A) 2.8                      (B) 1.8                      (C) 1.2                      (D) None of these

98. Given a and b are integers, then expression  $(a^2 + a + 2011)(2b + 1)$  is :  
(A) Odd for exactly 2010 values of a, b.  
(B) Odd for all values of a, b.  
(C) Even for exactly one value of a and two values of b.  
(D) Odd for exactly one values of a and one value of b.

99. Match the columns :

**Column – I**

(P) A shopkeeper gives two successive discounts on an article marked Rs. 450. The first discount given is 10%. If the customer pays Rs. 344.25 for the article, the second discount given is

(Q) A fan is listed at Rs. 1500 and a discount of 20% is offered on the list price. What additional discount must be offered to the customer to bring the net price to Rs. 1104 ?

(R) A retailer buys a sewing machine at a discount of 15% and sells it for Rs. 1955. Thus, he makes a profit of 15%. The discount he get is

(A) (P) → (i), (Q) → (ii), (R) → (iii)

(C) (P) → (iii), (Q) → (i), (R) → (ii)

(B) (P) → (ii), (Q) → (iii), (R) → (i)

(D) (P) → (ii), (Q) → (i), (R) → (iii)

**Column – II**

(i) Rs. 300

(ii) 15 %

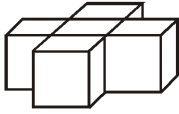
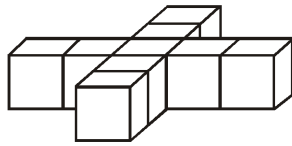
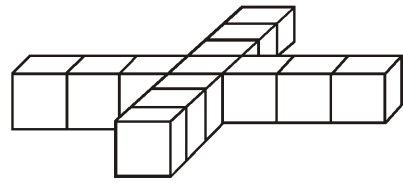
(iii) 8 %

---

*Space for Rough Work*



100. Study the given pattern.

**Pattern – 1****Pattern – 2****Pattern – 3**

(P) Which algebraic expression is used to find the number of cubes in  $n^{\text{th}}$  pattern ?

(Q) Which pattern will have 161 cubes ?

**(P)**

(A)  $4n + 1$

(B)  $n^2 + 4$

(C)  $n^2 + 4$

(D)  $4n + 1$

**(Q)**

24

24

40

40

101. Which of the following statements is/are correct ?

(i) If  $x < 0$ , then  $x^2 > x$

(ii) If  $x^2 > 0$ , then  $x > 0$

(iii) If  $x^2 > x$ , then  $x > 0$

(iv) If  $x < 1$ , then  $x^2 < x$

(A) Only (i)

(B) (i) and (ii)

(C) (iii) and (iv)

(D) (ii) and (iv)

102. If  $u, v$  and  $w$  are the digits of decimal system, then the rational number represented by  $0.uwuvuvuvuv\dots$  is

(A)  $(100uw + 99uv)/99$

(B)  $(99uw + uv)/980$

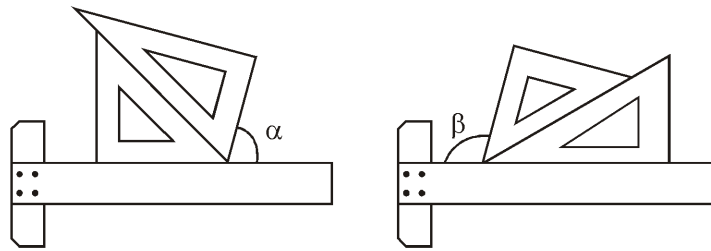
(C)  $(99uw + uv)/9900$

(D)  $(9uw + 99uv)/900$

*Space for Rough Work*



103. In the given figure, two set-squares are adjusted in two different methods, here one set-square is  $45^\circ - 90^\circ - 45^\circ$  and other is  $30^\circ - 90^\circ - 60^\circ$ , then what is the ratio of  $\alpha$  and  $\beta$ .



- (A)  $\frac{6}{7}$                       (B)  $\frac{4}{7}$                       (C)  $\frac{5}{7}$                       (D)  $\frac{3}{7}$
104. The sum of three numbers is 98. The ratio of the first to the second is  $\frac{2}{3}$  and the ratio of the second to the third is  $\frac{5}{8}$ . The second number is :
- (A) 15                      (B) 20                      (C) 30                      (D) 32
105. Latika owns a mobile worth Rs. 10000. She sells it to Priya at a profit of 10% based on the worth of the mobile. Priya sells the mobile back to Latika at a loss of 10%. In this transaction Latika gets \_\_\_\_.
- (A) No profit Rs. 110 loss                      (B) Profit of Rs. 1000  
(C) Profit of Rs. 1100                      (D) Loss of Rs. 1100

---

*Space for Rough Work*



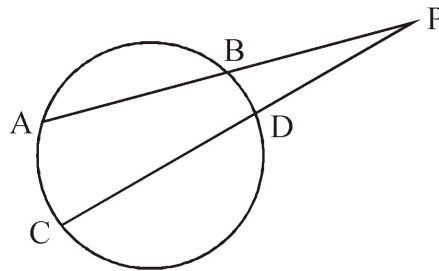
Question No. 106 – 120 are of Integer Answer Type Question.

Answer of these question will come from 00 to 99.

106. If  $5\frac{7}{x} \times y\frac{1}{13} = 12$ , where fractions are in their lowest terms, then  $x - y$  is equal to.

107. In the  $xy$ -plane let  $A$  be the point  $(5, 0)$  and  $L$  be the line  $y = \frac{x}{3}$ . The number of points  $P$  on the line  $L$  such that triangle  $OAP$  is isosceles is (O being the origin)

108. In the following figure, if  $PA = 12$  cm,  $PC = 15$  cm and  $CD = 7$  cm, then the value of  $AB$  is :



---

*Space for Rough Work*



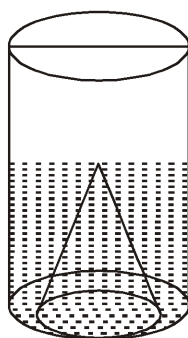
109. Out of 50 observations the mean of 25 observations is 30 and mean of rest 25 observations is 32, Then mean of 50 observations is :
110. The sides of a triangle are in the ratio of  $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$ . If the perimeter is 52 cm, then the length of the smallest side is :
111. The point (2, 3) is at a distance of \_\_\_\_\_ units from x-axis.
112. If 5 men take an hour to dig a ditch, how long should it take 12 men to dig a ditch of the same type ?
113. The number of edges in a pyramid with square base is :
114. In a two digit number, the number at ten's place is double of the number at unit's place. If we exchange the numbers mutually then the number decreases by 18, then the number is

---

*Space for Rough Work*



115. If  $\sqrt{13 - a\sqrt{10}} = \sqrt{8} + \sqrt{5}$ , then the value of  $|a|$  is
116. The cube of a number is 8 times the cube of another number. If the sum of the cubes of numbers is 243, then what is the difference of the numbers ?
117. If  $x = 16$ , then find the value of the expression  $\frac{x-1}{x^{3/4} + x^{1/2}} \cdot \frac{x^{1/2} + x^{1/4}}{x^{1/2} + 1} \cdot x^{1/4}$ .
118. Two pipes A and B can fill a tank in 36 hours and 45 hours respectively. If both the pipes are opened simultaneously, how much time will be taken to fill the tank ?
119. A bicycle dealer has Rs. 20,000 to invest, when a bicycle is available for Rs. 800. If the price of a bicycle increases by 25 %, find the number of cycles he can purchase with the same sum.
120. In the given figure, a right circular cone of diameter  $r$  cm and height 12 cm rests on the base of a right circular cylinder of radius  $r$  cm. Their bases are in the same plane and the cylinder is filled with water upto a height of 12 cm. If the cone is removed, then find the height to which water level will fall. (in cm)



---

*Space for Rough Work*