



Class – IX

School Accelerated Program

ENTRANCE TEST CUM SCHOLARSHIP TEST (Sample Paper-2)

[Time: 1 Hour 50 Min]

[Max Marks: 400]

A. General:

1. *This booklet is a Question Paper containing 100 questions.*
2. **Blank Papers, Clipboards, Log Tables, slide rules, calculators, cellular phones, pagers and electronic gadgets** in any form are not allowed to be carried inside the examination hall.
3. *The answer sheet, a machine-readable optical mark recognition sheet (OMR Sheet), is provided separately.*
4. **DO NOT TAMPER WITH THE OMR OR THE BOOKLET.**
5. *Please fill your roll number correctly in the OMR sheet (answer sheet).*
6. *Both Question Paper and OMR Answer Sheet will be submitted after completion of this examination.*

B. Question Paper Format and marking scheme:

1. *The Question Paper consists of five parts (Part I: MAT, Part II: Physics, Part III: Chemistry, Part IV: Biology, Part V: Mathematics).*
2. **Each Question carries +4 marks for correct answer and -1 mark for incorrect answer.**

MAT

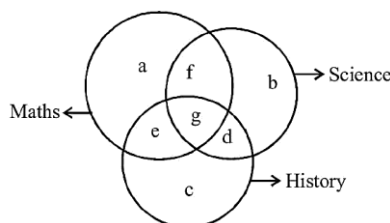
Direction (Qs. 1-3) : Complete the series

1. $\frac{1}{81}, \frac{1}{54}, \frac{1}{36}, \frac{1}{24}, ?$
(a) $\frac{1}{52}$ (b) $\frac{1}{9}$ (c) $\frac{1}{16}$ (d) $\frac{1}{18}$
2. 3, 5, 5, 19, 7, 41, 9, ?
(a) 71 (b) 61 (c) 72 (d) 69
3. Q1F S2E U6D W21C?
(a) Y 66 B (b) Y 88 B (c) Z 88 B (d) Y 44 B

Direction (Qs. 4-5) : In each of the following questions, four terms/words have been given, out of which three are alike in some manner and one is different. Choose the odd one out.

4. (a) Bottle : Wine (b) Cup : Tea (c) Pitcher : Water (d) Ball : Bat
5. (a) Atom : Electron (b) Train : Engine (c) House : Room (d) Curd : Milk
6. If in a certain code, HAT is 782, RABBIT is 681192. Then how will HABIT be coded as ?
(a) 78139 (b) 78192 (c) 68192 (d) 78129
7. In a certain code, ELEPHANT is written as TNPEAHLE, the CROCODILE will be written as?
(a) RCCOOIDEL (b) ELCOOIDRC
(c) ELCIOODRC (d) ELCOIODRC
8. Ajay is the brother of Vijay. Mili is the sister of Ajay. Sanjay is the brother of Rahul and Mehul is the daughter of Vijay. Who is Sanjay's Uncle ?
(a) Rahul (b) Ajay
(c) Mehul (d) Data inadequate
9. If $S - T$ means 'S' is the wife of 'T' $S + T$ means 'S' is the daughter of 'T' and $S \div T$ means 'S' is the son of 'T' What will $M + J \div K$ means ?
(a) 'K' is the father of 'M' (b) M' is the grand daughter of K
(c) 'J' is wife of 'K' (d) 'K' and 'M' are brothers
10. A is the uncle of B, who is the daughter of C and C is the daughter-in-law of P. How is A related to P ?
(a) Brother (b) Son
(c) Son-in-law (d) Data inadequate
11. If $\times$ stands for 'addition', $<$ for 'subtraction', $+$ stands for 'division', $>$ for 'multiplication', $=$ stands for 'equal to', $\div$ for 'greater than' and $\neq$ stands for 'less than', then which of the following is true ?
(a) $3 \times 2 < 4 \div 16 > 2 + 4$ (b) $5 > 2 + 2 = 10 < 4 \times 2$
(c) $3 \times 4 > 2 - 9 + 3 < 3$ (d) $5 \times 3 < 7 \div 8 + 4 \times 1$
12. Divya journeys 10 km to east then 10 km to south-west. He turns again and journeys 10 km to North-West. Which direction is he in from the starting point?
(a) South (b) North (c) West (d) East

Direction (Qs. 13 to 15) : Read the statements and choose the letter of the region which correctly represents the statement.



13. Students who took science but opted neither maths nor history:
(a) b (b) e (c) d (d) g
14. Students who took maths and history both but not science:
(a) c (b) a (c) e (d) g

15. Students who took all three subjects i.e. maths, history and science:

- (a) f (b) g (c) e (d) d

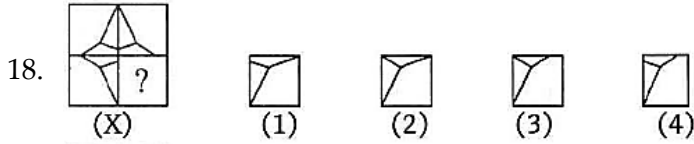
16. The first republic day of India was celebrated on 26th January, 1950. It was -

- (a) Monday (b) Tuesday (c) Thursday (d) Friday

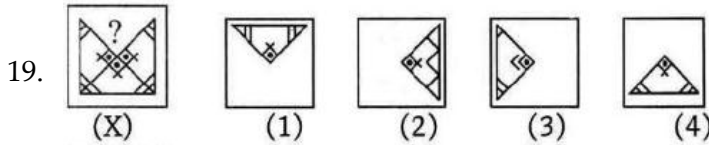
17. When the time by the watch is 20 minutes past 7, the angle between the hands of the watch is:

- (a) 100° (b) 90° (c) 80° (d) 95°

Direction (Qs. 18-19) : In each of the following questions, select a figure from amongst the four alternatives, which when placed in the blank space of fig. (X) would complete the pattern.



- (a) 1 (b) 2 (c) 3 (d) 4



- (a) 1 (b) 2 (c) 3 (d) 4

20. Find the correct option for the mirror image for the following question.

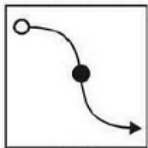
ANS 4 3 Q 1 2

(1) AN24E Q 1 2 (2) 2 1 Q 3 4 2 1 A

(3) 2 1 A 3 4 Q 2 1 (4) 1 2 Q 4 3 E A 1 2

- (a) 1 (b) 2 (c) 3 (d) 4

21. Find the correct option for the mirror image for the following question.

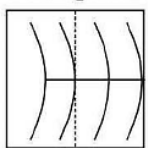


(X)

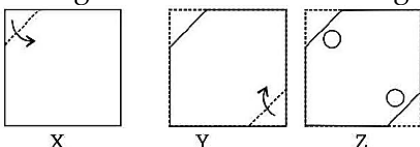


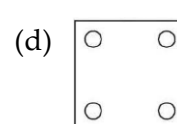
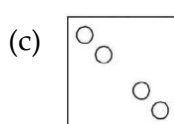
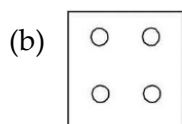
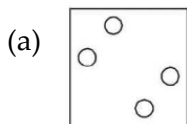
22. In the following question, find from amongst the four response figures, the one which resembles the pattern formed when the transparent sheet, carrying a design, is folded along the dotted line.

Transparent Sheet

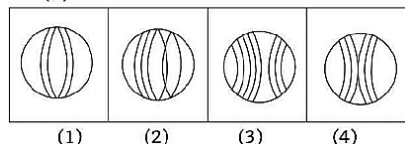
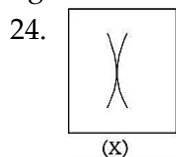


23. Consider the three figures, marked X, Y, and Z showing one fold in X, another in Y and the cut in Z. From amongst the four alternative figures a, b, c and d, select the one showing the unfolded position of Z.





Direction (Qs. 24-25) : In each of the following questions, you are given a figure (X) followed by four alternative figures (a), (b), (c) and (d) such that fig. (X) is embedded in one of them. Trace out the alternative figure which contains fig. (X) as its part.

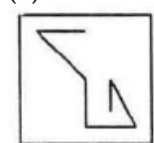


(a) 1

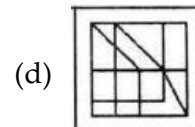
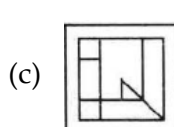
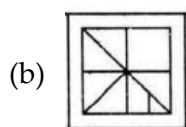
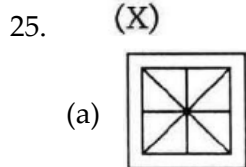
(b) 2

(c) 3

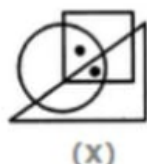
(d) 4



(X)



26. In the following question, there is a diagram marked (X), with one or more dots placed in it. The diagram is followed by four other figures, marked (a), (b), (c) and (d) only one of which is such as to make possible the placement of the dots satisfying the same conditions as in the figure (X). Find the correct answer figure.



(X)



27. In the following question below are given 3 statements followed by three conclusions numbered I, II & III. You have to take the given statements to be true even if they seem to be at variance from the commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follow from the given statements disregarding commonly known facts.

Statements : All fruits are vegetables. All pens are vegetables.

All vegetables are rains.

Conclusions:

I. All fruits are rains.

II. All pens are rains.

III. Some rains are vegetables.

(a) None follows

(b) Only I & II follow

(c) Only II & III follow

(d) All follows

Directions (Q-28-30): Study the information given below carefully and answer the following questions: When a machine is given an input which includes a line of words and numbers, the output received is arranged in a particular manner. Given below is an illustration of input along with the steps followed to get its output

Input: 34 lights ink 56 78 online defeat 99 orange range 87 22

Step I: 22 34 lights ink 56 78 online 99 orange range 87 defeat

Step II: 34 22 lights 56 78 online 99 orange range 87 defeat ink

Step III: 56 34 22 78 online 99 orange range 87 defeat ink lights

Step IV: 78 56 34 22 99 orange range 87 defeat ink lights online

Step V: 87 78 56 34 22 99 range defeat ink lights online orange

Step VI: 99 87 78 56 34 22 defeat ink lights online orange range

And step VI is the final step of the above input. Now, based on the same pattern, find the output for the input given below.

Input: 67 54 thankful message listing 23 45 known booklist 90 quit 88

28. How many steps will be required to get the final output?

- (a) Three (b) Eight (c) Seven (d) Six

29. Which of these will be the 3rd step?

- (a) 54 45 23 67 thankful message 90 quit 88 booklist known listing
(b) 45 23 54 67 thankful message 90 quit known listling booklist 88
(c) 23 67 54 thankful message listing 45 known 90 quit 88 booklist
(d) 23 67 54 thankful message listing 45 known 90 quit booklist 88

30. What will be the 4 th element from left in the 2 nd step of the output?

- (a) Thankful (b) 45 (c) 54 (d) Quit

PHYSICS

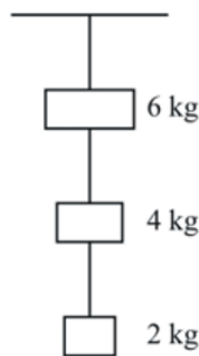
31. Consider a porter standing on a platform with a suitcase which presses his head with a force of 200N. If this force is taken to be the action, from where is the reaction force exerted and to where is it directed?

- (a) The head, on the suitcase (b) The earth, on the suitcase
(c) The earth, on the porter (d) The suitcase, on the earth

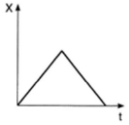
32. Newton's second law gives the measure of:

- (a) Acceleration (b) Force
(c) Momentum (d) Angular momentum

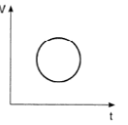
33. Three masses of 6 kg, 4 kg and 2 kg are attached to a rigid support as shown in figure. If the string attached to the support breaks and the system falls freely then the tension in the string connecting 4 kg and 2 kg mass is:



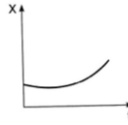
- (a) Zero (b) 8 kg wt (c) 12 kg wt (d) 6 kg wt

34. When a train stops suddenly, passengers in the running train feel an instant jerk in the forward direction because:
- the back of seat suddenly pushes the passengers forward.
 - inertia of rest stops the train and takes the body forward.
 - upper part of the body continues to be in the state of motion whereas the lower part of the body in contact with seat comes at rest.
 - nothing can be said due to insufficient data.
35. The magnitude of a physical quantity is 8.5 Ns. The physical quantity is:
- Force
 - Momentum
 - Pressure
 - Moment of force
36. A rifle bullet loses $1/20^{\text{th}}$ of its velocity in passing through a plank. The least number of such planks required just to stop the bullet is:
- 5
 - 10
 - 11
 - 20
37. Which one of the following curves do not represent motion in one dimension?
- 

(a)

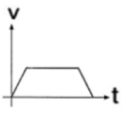


(b)

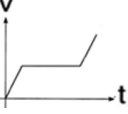


(c)

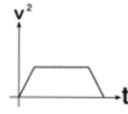


(d)
38. Which of the following represents the $v - t$ graph corresponding to the $a - t$ graph shown in figure?
- 
- 

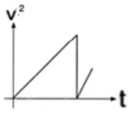
(a)



(b)



(c)



(d)
39. A car starts from rest and attains a speed of 8 m/sec in 2 seconds. It travels with uniform speed for the next 3 seconds. The total displacement of the car in 5 sec is:
- 4 m
 - 8 m
 - 16 m
 - 32 m
40. A body covers 200 cm in the first 2 sec and 220 cm in next 4 sec. What is the velocity of the body at the end of 7th second?
- 40 cm/sec
 - 20 cm/sec
 - 10 cm/sec
 - 5 cm/sec
41. If displacement of an object is proportional to square of time, then the object is moving with
- Uniform velocity
 - Uniform acceleration
 - Increasing acceleration
 - Decreasing acceleration
42. When a stone tied to a string is whirled in a circle, the work done on it by the string is:
- Positive
 - Negative
 - Zero
 - Undefined
43. A pair of bullocks exert a force of 140N on a plough through distance of 15 m. The work done by the bullocks is:
- 280 J
 - 1400 J
 - 2100 J
 - 21000 J
44. The kinetic energy of a body is directly proportional to its:
- Mass
 - Velocity
 - (velocity)²
 - Both (a) and (c)
45. A bullet of mass 20 g moving with a velocity of 500 m/s, strikes a tree and goes out from the other side with a velocity of 400 m/s. The work done by the bullet in joule in passing through the tree.
- 450 J
 - 900 J
 - 1000 J
 - 9000 J

CHEMISTRY

46. Isotopes of an elements have -
(a) Different chemical properties (b) Different atomic
(c) The same physical properties (d) Different number of neutrons
47. Which one of the following is a correct electronic configuration of calcium-
(a) 2, 8, 8, 1 (b) 2, 6, 8, 2 (c) 2, 8, 8, 2 (d) 2, 8, 2, 8
48. $^{40}_{18}\text{Ar}$ and $^{40}_{20}\text{Ca}$ have the same number of:
(a) Electron (b) Proton (c) Nucleons (d) Both A & C
49. Deflection back of a few particles on hitting thin foil of gold shows that-
(a) Nucleus is heavy
(b) Nucleus is small
(c) Both (A) and (B)
(d) Electron create hinderance in the movement of α -particles.
50. Which of the following electronic configuration represents a noble gas?
(a) 2, 8, 2 (b) 2, 8, 6 (c) 2, 8 (d) 2, 8, 8, 2
51. A species 'X' contains 9 protons, 10 electrons and 11 neutrons. It is:-
(a) A neutral atom (b) An isotope (c) A cation (d) An anion
52. Nucleus model of the atom was proposed by:-
(a) Thomson (b) Neils Bohr (c) Moseley (d) Rutherford
53. Which among the following is an example of a solid solution?
(a) Copper dissolved in gold (b) Ethanol dissolved in water
(c) Glucose dissolved in water (d) Sodium chloride dissolved in water
54. What will be the mass by mass percentage of a solution containing 30 g of common salt in 220 g of water?
(a) 0.03% (b) 1.2% (c) 12% (d) 22%
55. A mixture of starch and hot water is
(a) heterogeneous and shows Tyndall effect
(b) homogeneous and shows Tyndall effect
(c) heterogeneous and does not show Tyndall effect
(d) homogeneous and does not show Tyndall effect
56. Separation of cream from milk is done by
(a) Filtration (b) Centrifugation method
(c) Evaporaton (d) Boiling
57. Tincture of iodine has antiseptic properties. This solution is made by dissolving
(a) Iodine in potassium iodide (b) Iodine in Vaseline
(c) Iodine in water (d) Iodine in ethanol
58. How many grams of NaOH would need to be dissolved in 250.0 mL of solution to produce a 1.25 M solution?
(a) 12.5 g (b) 20.4 g (c) 40.00 g (d) 1.25 g
59. Crystallization is considered better than evaporation for obtaining pure crystal of sugar because -
(a) On heating sugar sublimes. (b) Sugar particles will evaporate.
(c) Sugar particles will decompose on heating. (d) Sugar particles will melt.
60. Which of the following method is used for separation of different components of petroleum?
(a) Fractional distillation (b) Sublimation
(c) Chromatography (d) Simple distillation

BIOLOGY

61. The basic building units of an onion bulb, are called _____
(a) Tissues (b) Cells (c) Scales (d) Roots
62. The longest cell in the human body is _____
(a) Nerve Cell (b) Muscle Cell (c) Liver Cell (d) Kidney Cell
63. Plasmolysis occurs due to _____
(a) Absorption (b) Endosmosis (c) Osmosis (d) Exosmosis
64. Solute concentration is higher in the external solution _____
(a) Hypotonic (b) Isotonic
(c) Hypertonic (d) None of the above
65. What is the shrinking of plant cell cytoplasm in a hypertonic solution called?
(a) Osmosis (b) Diffusion (c) Plasmolysis (d) Glycolysis
66. Colourless plastids are called:
(a) Chromoplasts (b) Chloroplasts (c) Leucoplasts (d) Protoplast
67. Which organelle is responsible for making proteins?
(a) Mitochondria (b) Ribosomes (c) Golgi apparatus (d) Vacuoles
68. Meristems are the cells that _____
(a) Store food (b) Help in excretion
(c) Provide support (d) divide continuously to produce new cells
69. One of the following is modification of parenchyma _____
(a) Fibres found in phloem (b) Tracheids
(c) Vessel (d) Chlorenchyma
70. A group of cells having a common origin and performing similar function is called _____
(a) Tissue (b) Organ (c) Organ system (d) cell aggregate
71. Which type of tissue forms glands?
(a) Epithelium (b) Muscular (c) Connective (d) Nervous
72. Parenchyma is a type of _____
(a) Complex tissue (b) Simple tissue (c) Xylem (d) Phloem
73. Which are the two types of tissues?
(a) Meristematic and permanent (b) Meristematic and temporary
(c) Meristems and temporary (d) None of the above
74. One of the following consists of dead cells _____
(a) Parenchyma (b) Sclerenchyma (c) Chlorenchyma (d) Collenchyma
75. Which tissue is responsible for carrying messages in the human body?
(a) Muscular tissue (b) Epithelial tissue
(c) Nervous tissue (d) Connective tissue

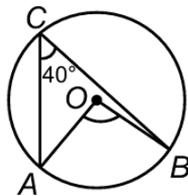
MATHEMATICS

76. A point $A(-1,3)$ is first reflected in the y-axis to get point B. Then, point B is reflected in the x-axis to get point C. What are the final coordinates of point C?
(a) $(-1, -3)$ (b) $(1, 3)$ (c) $(1, -3)$ (d) $(3, -1)$
77. If the midpoint of the line segment joining $P(-1, 2)$ and $Q(3, 6)$ is $M(x, y)$, what is the value of the product $x \cdot y$?
(a) 4 (b) 5 (c) 6 (d) 8

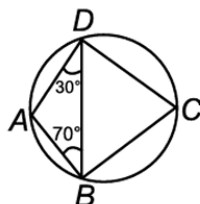
78. What is the distance of the point $P(5, -12)$ from the origin?
 (a) 7 (b) 12 (c) 13 (d) 17
79. A swimming pool containing 2,500 gallons of water is being drained at a constant rate of 40 gallons per minute. Which expression models the volume of water remaining, $V(m)$, after m minutes?
 (a) $V(m) = 2500 - 40m$ (b) $V(m) = 40m - 2500$
 (c) $V(m) = 2500 + 40m$ (d) $V(m) = -40 - 2500m$
80. Which of the following is a constant polynomial?
 (a) $f(x) = 0x^2 + 3x$ (b) $f(x) = -9$ (c) $f(x) = x$ (d) $f(x) = \frac{1}{x}$
81. Which of the following mathematical operations will always yield an irrational number as a result?
 (a) The sum of two distinct irrational numbers.
 (b) The product of two distinct irrational numbers.
 (c) The sum of a non-zero rational number and an irrational number.
 (d) The quotient of two identical irrational numbers.
82. Which of the following expressions results in a completely rational number upon simplification?
 (a) $(3 + \sqrt{5})(3 - \sqrt{5})$ (b) $\frac{\pi}{2}$ (c) $2\sqrt{3} + \sqrt{12}$ (d) $\sqrt{2} \times \sqrt{5}$
83. Evaluate the following expression completely using radical and exponent properties:

$$\frac{2^{n+4} - 2(2^n)}{2(2^{n+3})}$$

 (a) 2^n (b) $\frac{7}{8}$ (c) $\frac{1}{2}$ (d) 1
84. If $a^2 + b^2 + c^2 = 20$ and $a + b + c = 6$, find the value of $ab + bc + ca$.
 (a) 16 (b) 12 (c) 4 (d) 8
85. If $x = \sqrt[3]{2 + \sqrt{3}} + \sqrt[3]{2 - \sqrt{3}}$, find the value of $x^3 - 3x$.
 (a) 2 (b) 4 (c) $2\sqrt{3}$ (d) 6
86. Simplify the algebraic fraction: $\frac{(x^2 - y^2)^3 + (y^2 - z^2)^3 + (z^2 - x^2)^3}{(x - y)^3 + (y - z)^3 + (z - x)^3}$.
 (a) $(x - y)(y - z)(z - x)$ (b) $(x + y)(y + z)(z + x)$
 (c) $3(x + y)(y + z)(z + x)$ (d) 1
87. AD is a diameter of a circle and AB is a chord. If $AD = 34$ cm, $AB = 30$ cm then the distance of AB from the centre of the circle is ____ .
 (a) 17 cm (b) 15 cm (c) 4 cm (d) 8 cm
88. O is the centre of the circle. If $\angle ACB = 40^\circ$, then $\angle AOB$ is ____ .

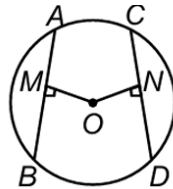


- (a) 50° (b) 80° (c) 90° (d) 40°
89. In the given figure, $\angle ABD = 70^\circ$, $\angle ADB = 30^\circ$. Then, $\angle BCD$ is ____ .



- (a) 90° (b) 80° (c) 100° (d) 120°

90. In the given figure, $AB = CD = 5$ cm, $OM = 3$ cm. Then ON is ____ .



- (a) 4 cm (b) 6 cm (c) 1.5 cm (d) 3 cm
91. A trapezium has parallel sides of length 25 cm and 11 cm . The remaining two nonparallel sides are 15 cm and 13 cm . What is its area?
 (a) 216 cm^2 (b) 180 cm^2 (c) 252 cm^2 (d) 144 cm^2
92. The perimeter of a rhombus is 40 cm . If the ratio of its diagonals is 3: 4, what is the area of the rhombus?
 (a) 96 cm^2 (b) 48 cm^2 (c) 192 cm^2 (d) 60 cm^2
93. The perimeter of a triangle is 50 cm . One side is 4 cm longer than the shortest side, and the third side is 6 cm less than twice the shortest side. Find the area of the triangle.
 (a) $30\sqrt{7} \text{ cm}^2$ (b) $20\sqrt{10} \text{ cm}^2$ (c) $20\sqrt{30} \text{ cm}^2$ (d) $15\sqrt{35} \text{ cm}^2$
94. The area of a square is equal to the area of a circle. What is the ratio of the side of the square to the radius of the circle?
 (a) $\sqrt{\pi}: 1$ (b) $\pi: 1$ (c) $1:\sqrt{\pi}$ (d) $1:\pi$
95. Two dice are thrown simultaneously. What is the probability that 5 will not come up on either die?
 (a) $\frac{1}{36}$ (b) $\frac{11}{36}$ (c) $\frac{25}{36}$ (d) $\frac{5}{6}$
96. Three coins are tossed simultaneously. What is the probability of getting at least two heads?
 (a) $\frac{1}{4}$ (b) $\frac{3}{8}$ (c) $\frac{5}{8}$ (d) $\frac{1}{2}$
97. If the probability of an event E is p , then the probability of its complementary event $\bar{E}$ is:
 (a) $p - 1$ (b) $1 - p$ (c) p (b) $1 - \frac{1}{p}$
98. Which term of the AP: 100,93,86, ... is the very first negative term?
 (a) 14th (b) 15th (c) 16th (d) 17th
99. Find the sum of all natural numbers less than 100 which are multiples of 3 .
 (a) 1633 (b) 1650 (c) 1665 (d) 1683
100. What is the common ratio of a GP whose first term is 5 and the sum of whose second and third terms is 30?
 (a) 2 or -3 (b) -2 or 3 (c) 1 or -5 (d) -1 or 5