



Class – IX

School Integrated Program

ENTRANCE TEST CUM SCHOLARSHIP TEST

[Time: 3 Hours]

[Max Marks: 300]

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.*

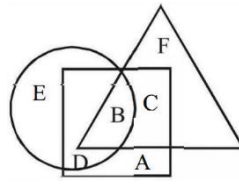
B. Question Paper Format and marking scheme:

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 +3 marks for correct answer and -1 mark for incorrect answer.*

MAT

1. What will come in place of question mark in the following number series?
3F, 6G, 11I, 18L, ?
(a) 21O (b) 25 N (c) 27 P (d) 27Q
 2. What will come in place of question mark in the following number series?
2,3,10,15,26,35,50,63, ?
(a) 80 (b) 82 (c) 83 (d) 84
 3. What will come in place of question mark in the following number series?
41,31,?,17,11,5
(a) 19 (b) 21 (c) 23 (d) 27
 4. Arrange the given words in the sequence in which they occur in the dictionary and then choose the correct sequence.
1. Page 2. Pagan 3. Palisade 4. Pageant
5. Palate
(a) 1,4,2,3,5 (b) 2,4,1,3,5 (c) 2,1,4,5,3 (d) 1,4,2,5,3
 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.
(a) POCG (b) KLIZ (c) BUDX (d) FQMV
 6. If in a certain code language, 'MIRROR' is coded as '13918181518', how will 'APPLE' be coded in the same language ?
(a) 11616125 (b) 3984145 (c) 1162254 (d) 11213147
 7. If 'SKY WAS BLUE' is 123, 'SEA IS BLUE' is 245, 'PEOPLE SWIMMING IN SEA' is 4678, 'PEOPLE LIKE SKY' is 801 and 'BIRDS IN SKY' is 169. Then 'PEOPLE LIKE BIRDS' will have the number.
(a) 809 (b) 104 (c) 036 (d) 806
- Direction (Q. 8-10) :** Read the following information carefully to answer the questions.
- (i) 'A\$ B' means 'A' is mother of 'B' (ii) 'A' #B' means 'A' is father of 'B'
 - (iii) 'A@ B' Means 'A' is husband of 'B' (iv) 'A% B' means 'A' is daughter of 'B'
8. P@Q\$M# T indicates what relationship of P with T
(a) Paternal grandmother (b) Maternal grandmother
(c) Paternal grandfather (d) Maternal grandfather
 9. Which of the following expressions indicates 'R is the sister of H' ?
(a) H \$ D @ F # R (b) R%D@F\$H
(c) R\$D@ F#H (d) H % D @ F \$ R
 10. If F@D% K#H, then how is F related to H ?
(a) Brother-in-law (b) Sister
(c) Sister-in-law (d) Cannot be determined
 11. Jatin leaves his house and walks 12 km towards North. He turns right and walks another 12 km . He turns right again, walks 12 km more and turns left to walk 5 km . How far is he from his home and in which direction?
(a) 7 km East (b) 10 km East
(c) 17 km East (d) 24 km East

Direction (Q. 12-13) : In the following diagram, three classes of population are represented by three figures. The triangle represents the school teachers, the square represents the married persons and the circle represents the persons living in joint families.

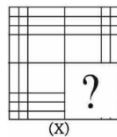


12. Married persons living in joint families but not working as teachers are represented by
 (a) C (b) F (c) D (d) A
13. Persons who live in joint families, are unmarried and who do not work as teachers are represented by
 (a) C (b) B (c) E (d) D
14. Select a figure from the four alternatives, which when placed in the blank space of figure (X) would complete the pattern.



- (a) (b) (c) (d)

15. Select a figure from the four alternatives, which when placed in the blank space of figure (X) would complete the pattern.



- (a) (b) (c) (d)

DIRECTIONS (Q.16-17) : Find the correct option for the mirror images for the following

16. 3 1 2 5 6 8 | ?

- (a) 3 1 2 5 6 8 (b) 8 6 5 2 1 3
 (c) 8 6 5 2 1 3 (d) 8 6 5 2 1 3

17. jealous | ?

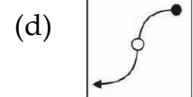
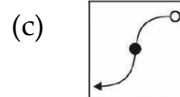
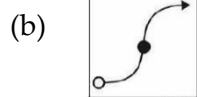
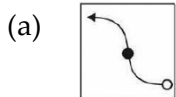
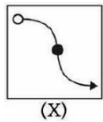
- (a) | ɹɐslouɹ (b) | ɹɐslouɹ
 (c) ɹɐslouɹ | (d) ɹɐslouɹ |

Direction (Qs.18-19) : Find the correct option for the water images for the following

18.

- (a) (b) (c) (d)

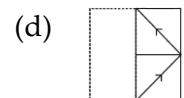
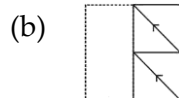
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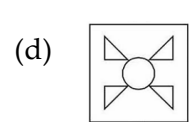
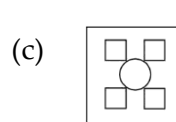
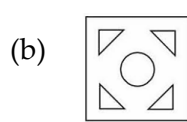
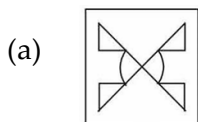
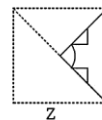
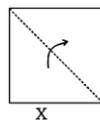
20. In the following question, find from amongst the four response figures, the one which resembles the pattern formed when the transparent sheet, carrying a design, is folded along the dotted line.



Response Figure

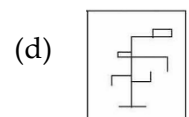
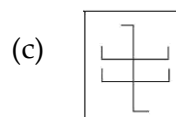
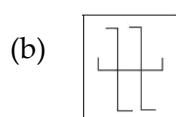
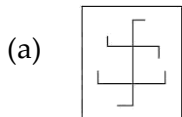
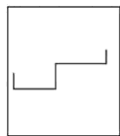


21. Consider the three figures, marked X, Y, and Z showing one fold in X, another in Y and the cut in Z. From amongst the four alternative figures a, b, c and d, select the one showing the unfolded position of Z.

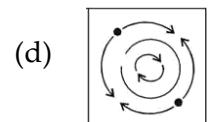
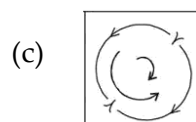
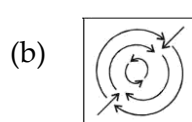
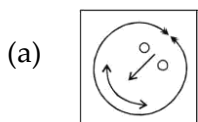
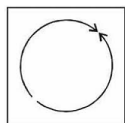


DIRECTIONS (Q. 22-23) : In each of the following questions, you are given a figure (X) followed by four alternative figures (a), (b), (c) and (d) such that fig. (X) is embeded in one of them. Trace out the alternative figure which contains fig. (X) as its part.

22.



23.



Directions (Q24 to Q26): A machine rearrangement gave input with both numbers and words in a particular set of rules in step by step. Based on the input given below, answer the questions following it.

Input: glass 12 42 kite lights 66 numbers 11 68 pilot

Step I: 68 pilot glass 12 42 kite lights 66 numbers 11

Step II: 66 numbers 68 pilot glass 12 42 kite lights 11

Step III: 42 lights 66 numbers 68 pilot glass 12 kite 11

Step IV: 12 kite 42 lights 66 numbers 68 pilot glass 11

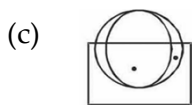
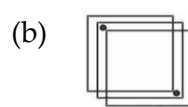
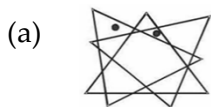
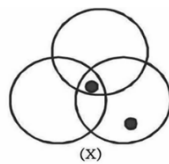
Step V: 11 glass 12 kite 42 lights 66 numbers 68 pilot

And Step V is the last step

Now, based on the above machine arrangement, solve the input given below:

Input: 23 height pencil 54 89 wage loop 61 92 merge

24. Which of the following is the last step?
- 92 wage 23 height pencil 54 89 loop 61 merge
 - 23 height 54 loop 61 merge 89 pencil 92 wage
 - 89 pencil 92 wage 23 height 54 loop 61 merge
 - 61 merge 89 pencil 92 wage 23 height 54 loop
25. How many steps are required get the final result?
- Six
 - Five
 - Three
 - Four
26. What is the 3rd element from left in Step III?
- Pencil
 - Height
 - 89
 - 61
27. In the following question there is a diagram marked in which one or more dots have been placed in certain positions. Examine the placement of these dots carefully. From the four choices given below dots, select the one in which the placement of dots is similar to that in the diagram marked (X).

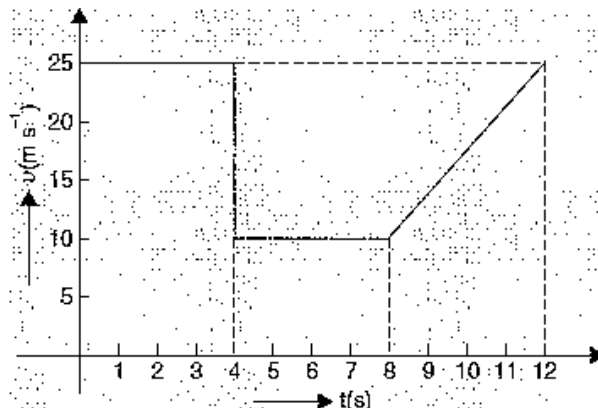


28. Find the exact time between 7 am and 8 am when the two hands of a watch meet ?
- 7 hrs 35 min
 - 7 hrs 36.99 min
 - 7 hrs 38.18 min
 - 7 hrs 42.6 min
29. On January 12, 1980, it was Saturday. The day of the week on January 12, 1979 was -
- Saturday
 - Friday
 - Sunday
 - Thursday
30. In the following question, three statements of numbers following same rules are given. Find the rule and accordingly find the value of the number?
- If $84 \oplus 72 = 45$; $63 \oplus 41 = 33$, $25 \oplus 52 = 33$, then $94 \oplus 82 = ?$
- 45
 - 59
 - 56
 - 65

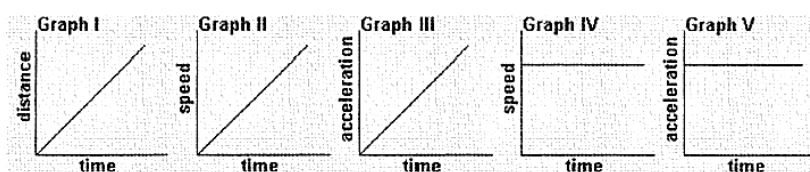
PHYSICS

31. The velocity-time graph of a particle starting from rest with uniform acceleration is a straight line ____.
- not passing through origin.
 - parallel to time axis.
 - parallel to velocity axis.
 - having none of the above characteristics.
32. The impulse of a body is equal to:
- rate of change of its momentum
 - change in its momentum
 - the product of force applied on it and the time of application of the force.
 - both option (b) and (c)
33. A body of mass 10kg moves at a constant velocity of 10m/s. Now, a constant force acts for 4s on the body and gives it a speed of 2m/s in the opposite direction. The impulse acting on the object is
- 140Ns
 - 120Ns
 - 60Ns
 - 60Ns

34. A body covers one-third of the time with a velocity v_1 the second one-third of the time with a velocity v_2 , and the last one-third of the time with a velocity v_3 . The average velocity is:
 (a) $\frac{v_1+v_2+v_3}{3}$ (b) $\frac{3v_1v_2v_3}{v_1v_2+v_2v_3+v_3v_1}$ (c) $\frac{v_1v_2+v_2v_3+v_3v_1}{3}$ (d) $\frac{v_1v_2v_3}{3}$
35. The initial velocity of particle is 20m/s and its retardation is 2m/s². Find out the distance moved by the particle in 5th second of its motion.
 (a) 11m (b) 50m (c) 19m (d) 31m
36. The velocity vs time graph of particle moving in a straight line is shown in Fig. The average velocity of the particle is



- (a) 12.5m/s (b) 15m/s (c) 17.5m/s (d) 20m/s
37. An object with a mass of 1 tonne moves at a constant velocity of 10m/s. A constant force then acts on the particle for 4s such that the velocity of particle increases to 30m/s. Find out the force applies
 (a) 3000N (b) 2000N
 (c) 5000N (d) None of these
38. A train of length 200m travelling at 30m/s overtakes another train of length 300m travelling in the same direction at 20m/s. The time taken by the first train to pass the second is
 (a) 10s (b) 30s (c) 40s (d) 50s
39. A bullet fired into a target loses half its velocity after penetrating 50cm. How much further will it penetrate before coming to rest (assume that the bullet is uniformly retarding).
 (a) 5cm (b) 12.5cm
 (c) 8.3cm (d) None of these
40. Two bodies, A (of mass 1kg) and B (of mass 3kg), are dropped from heights of 16m and 25m, respectively. The ratio of the time taken by them to reach the ground is ($g = 10 \text{ m s}^{-2}$)
 (a) $\frac{16}{25}$ (b) $\frac{12}{5}$ (c) $\frac{5}{12}$ (d) $\frac{4}{5}$
41. A marble block of mass 2kg lying on ice when given a velocity of 30m/s is stopped after covering 1km. Then the coefficient of friction between ground and the marble block is. ($g=10\text{m/s}^2$)
 (a) 0.3 (b) 0.045
 (c) 0.18 (d) None of these
42. A toy car moves 3m to the North in two second. The car then moves at $\frac{8}{3}\text{m/s}$ due east for another three seconds. What is the magnitude of average velocity of the car for whole motion
 (a) 4m/s (b) 5m/s
 (c) 6m/s (d) None of these
43. Which of the following graphs could correctly represent the uniformly accelerated motion of an object.

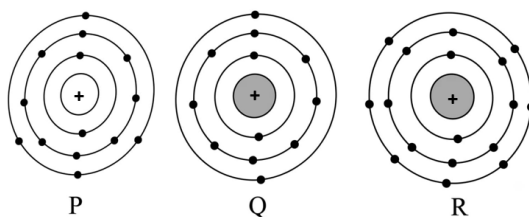


- (a) Graph I only (b) Graphs II and V only
 (c) Graph II only (d) Graphs I and IV only

44. A train is moving with a velocity of 30m/s. When brakes are applied, it is found that the velocity reduces to 10m/s in 240m. If during braking the train is deaccelerating uniformly. find out the stopping distance of the train.
 (a) 220m (b) 240m (c) 250m (d) 270m
45. If a horizontal force of 100N act on the particle of mass 50kg placed on the ground at rest. What will be the momentum possessed by the particle at 4s. ($g = 10\text{m/s}^2$)
 (a) 200kgm/s (b) 800kgm/s
 (c) 400kgm/s (d) None of these

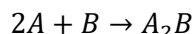
CHEMISTRY

46. A brief information about two atoms P and Q is given below.
 P : Atomic number = 8, Mass number = 16
 Q : Atomic number = 8, Mass number = 18
 Which of the following is correct about these two atoms?
 (a) Electronic configuration of P is 2,4,2 while that of Q is 2,6 .
 (b) Both P and Q contain same number of neutrons.
 (c) P and Q both have 2 electron shell.
 (d) Both P and Q have 4 valence electrons.
47. The distribution of electrons in the outermost shells of three elements P , Q and R is shown in the given figure.



- The formulae of compounds formed by P and Q with R are, respectively
 (a) PR_2 and QR_3 (b) PR and QR_3
 (c) PR_3 and QR_2 (d) P_2R and QR_3
48. The number of electrons in an element X is 17 and the number of neutrons in X is 18 . Which of the following is the correct representation of the element?
 (a) $^{18}_{17}X$ (b) $^{35}_{18}X$ (c) $^{35}_{17}X$ (d) $^{17}_{18}X$
49. The masses of an electron, a proton and a neutron, respectively, will be in the ratio
 (a) 1: 1838.15: 1840.54 (b) 1: 1856.15: 1858.68
 (c) 1: 1834.15: 1836.68 (d) 1: 1846.15: 1848.68
50. Isotones of $^{76}_{32}\text{Ge}$ is
 (a) $^{72}_{32}\text{Ge}$ (b) $^{77}_{33}\text{As}$ (c) $^{77}_{34}\text{Se}$ (d) $^{79}_{34}\text{Se}$
51. One atom of deuterium contains
 (a) One neutron and one positron (b) One neutron and one proton
 (c) One neutron and two protons (d) Two neutrons and one proton
52. Which of the following contains the greatest number of atoms?
 (a) 0.3 mol of nitrogen gas (b) 0.5 mol of oxygen gas
 (c) 0.4 mol of ozone gas (d) 0.2 mol of carbon dioxide gas
53. A solution which at a given temperature dissolves as much solute as it is capable of dissolving is said to be a
 (a) Saturated solution (b) Unsaturated solution
 (c) Semi saturated solution (d) Super saturated solution

54. Fog is an example of
 (a) Foam (b) Emulsion (c) Aerosol (d) Gel
55. Butter is a colloidal solution of
 (a) Liquid in liquid (b) Gas in liquid
 (c) Solid in liquid (d) Solid in gas.
56. When a colloidal solution is kept in dark and is illuminated by a beam of light, then brightness appears at the right angle of direction of light. This effect is called
 (a) Tyndall effect (b) Brownian effect
 (c) Hardy-Schulze effect. (d) None of these
57. Two substances, A and B were made to react to form a third substance, A_2B according to the following reaction



Which of the following statements concerning this reaction are incorrect?

- (i) The product A_2B shows the properties of substances A and B.
 (ii) The product will always have a fixed composition.
 (iii) The product so formed cannot be classified as a compound.
 (iv) The product so formed is an element.
- (a) (i) (ii) (iii) (b) (iii) (iv) (c) (i) (iii) (iv) (d) (ii) (iii)
58. X and Y cannot be broken down into simpler substances by simple chemical reactions but they combine to give P. Which of the following statements about the concerning the species X, Y and P are correct?
 (i) P is a compound.
 (ii) X and Y are compounds.
 (iii) X and Y are elements.
 (iv) P had a fixed composition.
- (a) (i) (ii) (iii) (b) (iii) (iv) (c) (i) (iii) (iv) (d) (ii) (iii)
59. Which of the following statements are correct?
 (i) Molecular mass of CH_3OH is 32 u .
 (ii) In NH_3 , the ratio of N and H by mass is 14: 3.
 (iii) The formula mass of $CaCl_2$ is 111 u .
 (iv) Isotopes have same mass number.
- (a) (i) (ii) (iii) (b) (iii) (iv) (c) (i) (iii) (iv) (d) (ii) (iii)
60. Calculate the formula unit mass of $ZnCl_2$. (nearest approximation) (Zn molecular mass = 65.3u)
 (a) 111u (b) 123u (c) 124u (d) 137u

BIOLOGY

61. A cell is placed in a solution, and after some time, it swells up and bursts. What kind of solution was the cell placed in ?
 (a) Hypertonic solution (b) Isotonic solution
 (c) Hypotonic solution (d) Saturated solution
62. Which of the following cell organelles is responsible for cellular scavenging and disposing of worn-out cell parts?
 (a) Golgi apparatus (b) Lysosomes
 (c) Mitochondria (d) Endoplasmic reticulum
63. While observing a slide of a plant tissue under a microscope, a student notices cells with irregularly thickened corners due to cellulose and pectin deposition, leaving very little intercellular space. Which tissue is this?

- (a) Parenchyma (b) Sclerenchyma
(c) Collenchyma (d) Xylem
64. Flexibility in plants is largely due to which permanent tissue?
(a) Collenchyma (b) Sclerenchyma
(c) Parenchyma (d) Chlorenchyma
65. Which type of epithelial tissue forms the lining of kidney tubules and salivary glands, providing mechanical support?
(a) Squamous epithelium (b) Cuboidal epithelium
(c) Columnar epithelium (d) Stratified squamous epithelium
66. In a list of organisms containing Amoeba, Hydra, Yeast, and Spirogyra, which one reproduces by the process of multiple fission under unfavorable conditions?
(a) Hydra (b) Yeast
(c) Amoeba (d) Spirogyra
67. Plants like ferns and mosses reproduce without setting seeds. They belong to which group and reproduce using which structure?
(a) Phanerogams, Seeds (b) Cryptogams, Spores
(c) Angiosperms, Fruits (d) Gymnosperms, Cones
68. Consider the following statements regarding sexual reproduction:
I. It involves the fusion of male and female gametes.
II. It results in offspring that are genetically identical to a single parent.
Which of the statements is/are correct?
(a) Only I (b) Only II
(c) Both I and II (d) Neither I nor II
69. Whittaker's five-kingdom classification system is primarily based on which of the following criteria?
(a) Mode of locomotion and reproduction
(b) Cell structure, mode of nutrition, and body organization
(c) Presence or absence of a cell wall only
(d) Habitat and geographic distribution
70. An organism is eukaryotic, multicellular, heterotrophic, and possesses a cell wall made of chitin. To which kingdom does it belong?
(a) Plantae (b) Monera
(c) Protista (d) Fungi
71. Which group of plants is famously known as the "amphibians of the plant kingdom"?
(a) Thallophyta (b) Bryophyta
(c) Pteridophyta (d) Gymnosperms
72. Karl von Linné (Carl Linnaeus) is famous for introducing which system of naming organisms?
(a) Monomial nomenclature (b) Trinomial nomenclature
(c) Binomial nomenclature (d) Phylogenetic nomenclature
73. Which of the following muscular tissues is involuntary, lacks striations, and is found in the walls of internal organs like the stomach?
(a) Skeletal muscle (b) Smooth muscle
(c) Cardiac muscle (d) Striated muscle
74. Chromosomes are made up of which of the following components?
(a) DNA only (b) Protein only
(c) DNA and Protein (d) RNA and Carbohydrates
75. Organisms belonging to Phylum Nematoda (Aschelminthes) are characterized by having:
(a) A true coelom (b) Pseudocoelom (false body cavity)
(c) No body cavity at all (d) Radial symmetry

MATHEMATICS

76. What are the coordinates of the origin?
(a) (1,1) (b) (0,0) (c) (-1,-1) (d) (0,1)
77. The x -coordinate of a point lying on the y -axis is always:
(a) 1 (b) -1
(c) 0 (d) Any positive number
78. The area of the triangle formed by the points (0,0), (4,0), and (0,3) is:
(a) 6 sq units (b) 12 sq units (c) 7 sq units (d) 10 sq units
79. What is the distance between the point $A(a, b)$ and $B(-a, -b)$?
(a) 0 (b) $2\sqrt{(a^2 + b^2)}$ (c) $\sqrt{(a^2 + b^2)}$ (d) $a^2 + b^2$
80. In the algebraic expression $4x + 5y + 3$, what is the coefficient of x ?
(a) 3 (b) 4 (c) 5 (d) 12
81. In the equation $y = -3x + 4$, what is the y-intercept?
(a) -3 (b) 3 (c) 4 (d) -4
82. If a quantity increases by a constant amount over equal intervals, it represents:
(a) Quadratic growth (b) Linear decay
(c) Linear growth (d) Exponential growth
83. What is the area of the triangle bounded by the graph of $y = 2x + 4$ and the coordinate axes?
(a) 2 sq units (b) 4 sq units (c) 8 sq units (d) 16 sq units
84. A rational number is of the form $\frac{p}{q}$, where p and q are integers and q is not equal to:
(a) 1 (b) -1 (c) 0 (d) p
85. What is the product of two negative integers (two debts)?
(a) Zero (b) A debt (c) A fortune (Positive) (d) ∞
86. Rationalize the denominator: $\frac{1}{\sqrt{3}-\sqrt{2}}$
(a) $\sqrt{3} + \sqrt{2}$ (b) $\sqrt{3} - \sqrt{2}$ (c) 1 (d) -1
87. If $a + b + c = 0$, what is the value of $a^3 + b^3 + c^3$?
(a) 0 (b) abc (c) $3abc$ (d) $-3abc$
88. If $x + \frac{1}{x} = 3$, find the value of $x^3 + \frac{1}{x^3}$.
(a) 27 (b) 18 (c) 24 (d) 36
89. The longest chord of a circle is called its:
(a) Radius (b) Secant (c) Diameter (d) Tangent
90. The angle subtended by a diameter at any point on the circle is:
(a) 45° (b) 60° (c) 90° (d) 180°
91. How many circles can pass through three non-collinear points?
(a) Zero (b) Exactly one
(c) Two (d) Infinitely many
92. Two parallel chords of lengths 16 cm and 12 cm are on the same side of the centre of a circle of radius 10 cm. Find the distance between them.
(a) 2 cm (b) 4 cm (c) 14 cm (d) 8 cm
93. The area of a regular hexagon with a side length of 4 cm is:
(a) $12\sqrt{3}sqcm$ (b) $24\sqrt{3}sqcm$ (c) $16\sqrt{3}sqcm$ (d) $8\sqrt{3}sqcm$
94. If $x + y + z = 10$ and $xy + yz + zx = 31$, what is the value of $x^2 + y^2 + z^2$?
(a) 100 (b) 38 (c) 70 (d) 310
95. The decimal expansion of $\frac{3}{20}$ is:
(a) 0.15 (b) 0.3 (c) 0.015 (d) 1.5
96. Convert the general repeating decimal 0.1666 ... into a fraction in lowest terms.
(a) $\frac{1}{6}$ (b) $\frac{1}{9}$ (c) $\frac{16}{99}$ (d) $\frac{1}{3}$
97. If the ratio of the perimeters of two circles is 5:4, what is the ratio of their areas?
(a) 25:16 (b) 16:25 (c) 5:4 (d) 4:5

98. What is the area of a sector of a circle with radius r and sector angle θ° ?

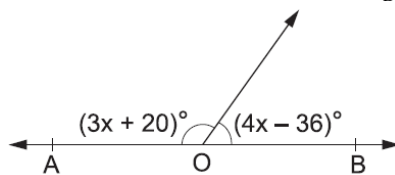
(a) $\left(\frac{\theta}{360}\right) \times 2\pi r$

(b) $\left(\frac{\theta}{360}\right) \times \pi r^2$

(c) $\left(\frac{\theta}{180}\right) \times \pi r^2$

(d) $\left(\frac{\theta}{360}\right) + \pi r^2$

99. In the adjoining figure, what value of x will make AOB , a straight line?



(a) 27°

(b) 28°

(c) 29°

(d) 20°

100. Two adjacent angles on a straight line are in the ratio 5 : 4. Find the measure of the respective angles.

(a) $60^\circ, 120^\circ$

(b) $80^\circ, 100^\circ$

(c) $100^\circ, 80^\circ$

(d) $120^\circ, 60^\circ$