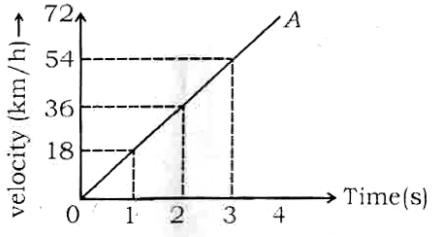
STATE TALENT SEARCH EXAMINATION-2018-19
SCHOLASTIC APTITUDE TEST (SAT) HINTS & SOLUTIONS

1. In the given velocity-time graph, the distance covered by the body in 3s is



(1) 22.50 m (2) 45.0 m (3) 90.00 m (4) 112.50 m

Ans. (1)

Sol. distance = Area under v-t curve

$$= \frac{1}{2} \times \left(54 \times \frac{5}{18}\right) \times 3$$

$$= 22.5 \text{ m}$$

2. The rate of change of momentum is equal to

(1) applied force (2) impulse (3) pressure (4) work

Ans. (1)

Sol.

3. On playing carom board powder is used to

(1) increase friction (2) decrease friction (3) increase work done (4) decrease momentum

Ans. (2)

Sol.

4. Which of the following is not a unit of foce ?

(1) poundal (2) newton (3) dyne (4) pascal

Ans. (4)

Sol.

5. Which of the following is the vector quantity?

(1) Distance (2) Speed (3) Acceleration (4) Work

Ans. (3)

Sol.

6. Lactometer and hydrometer are based on the

(1) Newton's first law (2) Law of conservation of momentum

(3) Principle of Archimedes (4) Newton's second law

Ans. (3)

Sol.

7. A body of mass 6 kg moving with velocity 15 m/s collides with a second body of mass 10 kg, which is at rest. After collision first body's velocity is 5 m/s. The velocity of second body after collision will be

(1) 4 m/s (2) 6 m/s (3) 8 m/s (4) 19 m/s

Ans. (2)

Sol. from conservation of momentum

$m_1v_1 + m_2v_2 = m_1u_1 + m_2u_2$

$6 \times 5 + 10 \times v_2 = 6 \times 15 + 10 \times 0$

$30 + 10v_2 = 90$

$10v_2 = 90 - 30$

$v_2 = \frac{60}{10} = 6 m/s$

8. Which of the following planets has maximum gravitational acceleration in the solar system?

(1) Mercury (2) Venus (3) Saturn (4) Jupiter

Ans. (4)

Sol.

9. The weights of the body of mass 50 kg in a free falling artificial satellite is

(1) zero (2) 49 N (3) 50 N (4) 98N

Ans. (1)

Sol. In free fall motion condition of weightlessness so

$w = 0$

10. The unit of universal gravitational constant G is

(1) Nm^2/Kg^2 (2) N^2m/Kg^2 (3) N^2m/Kg (4) Nm/Kg^2

Ans. (1)

11. If the radius of a planet becomes double then the gravitational acceleration would (if mass is constant)

(1) remain same (2) be one-fourth (3) be half (4) be double

Ans. (2)

Sol. $g = \frac{GM}{R^2}$

$g' = \frac{GM}{(2R)^2} = \frac{GM}{4R^2}$

$g' = \frac{2}{4}$

12. The radius of curvature of a concave mirror is 28 cm. Its focal length is

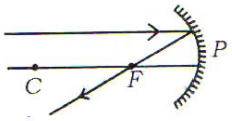
(1) 7cm (2) 14 cm (3) 28 cm (4) 56 cm

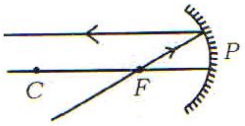
Ans. (2)

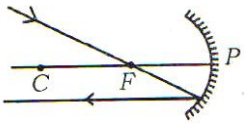
Sol. $R = 2f$

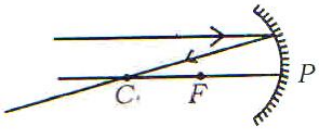
$f = \frac{R}{2} = \frac{28}{2} = 14cm$

13. Which of the following ray diagrams is not correct ?

(1) 

(2) 

(3) 

(4) 

Ans. (4)

Sol.

14. Refraction from denser to rare medium for a light ray, the value of angle of refraction at the condition of critical angle is

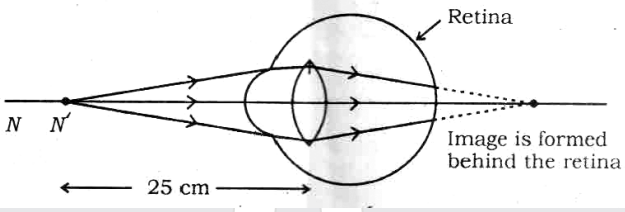
(1) 0° (2) 45° (3) 90° (4) 180°

Ans. (3)

Sol. At $\angle i = \angle c$

$\angle r = 90°$

15. In the given figure the eye is suffering from

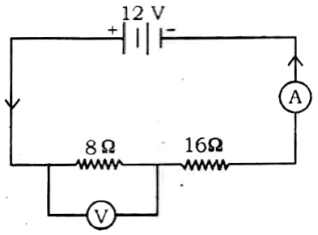


(1) Myopia (2) Hypermetropia (3) Astigmatism (4) Cataract

Ans. (2)

Sol.

16. In the given circuit, the reading of the ammeter is



(1) 0.5 A (2) 1.0 A (3) 2.0 A (4) 2.5 A

Ans. (1)

Sol. Req = 8 + 16 = 24 Ω

$$I = \frac{V}{Req} = \frac{12}{24} = 0.5A$$

17. If the length of a resistance wire is doubled and its cross-sectional area is halved, then the resistivity would

(1) increase two times (2) increase four times (3) increase eight times (4) remain unchanged

Ans. (4)

Sol. Resistivity depends only on material at given temperature not on length & area.

18. Electric current generator converts

(1) sound energy into electric energy (2) electric energy into sound energy

(3) mechanical energy into electric energy (4) electric energy into mechanical energy

Ans. (3)

Sol.

19. The resistance of a bulb marked '220 V, 10 W' is

(1) 121 Ω (2) 242 Ω (3) 4840 Ω (4) zero

Ans. (3)

Sol. from $p = \frac{v^2}{R}$

$R = \frac{v^2}{P} = \frac{220 \times 220}{10}$

$R = 4840\ \Omega$

20. For a current carrying conductor, in the 'Right hand law' the thumb points towards the
(1) direction of magnetic field (2) direction of electric current
(3) direction of earth's magnetic field (4) none of these

Ans. (2)

Sol.

21. A body of mass m undergoes a change in speed from u to v by applying force F and the body travels a distance of s. The work done by the force is

(1) $\frac{1}{2}m(v^2 - u^2)$ (2) $\frac{m(v^2 - u^2)}{2s}$ (3) $\frac{m(v^2 - u^2)s}{s}$ (4) $\frac{v^2 - u^2}{2ms}$

Ans. (1)

Sol. from work-energy theorem

$W = \Delta K.E.$

$W = \frac{1}{2}m\,(v^2 - u^2)$

22. For producing equal light energy, which of the following devices use minimum electric energy?
(1) Incandescent bulb (2) Tubelight (3) CFL light (4) LED light

Ans. (4)

Sol.

23. A foce of 20 N acts on a body of mass 10 kg and the body moves 2 m at an angle of 45° to the direction of the force in 4 second. The dissipated power is

(1) $5\sqrt{2}\,J/s$ (2) $\frac{5}{\sqrt{2}}J/s$ (3) $10\sqrt{2}\,J/s$ (4) $\frac{10}{\sqrt{2}}J/s$

Ans. (1)

Sol. $\text{Power} = \frac{\text{Work}}{\text{Time}} = \frac{FS\cos\theta}{t}$

$\Rightarrow \frac{20 \times 2 \times \cos 45°}{4} = 5\sqrt{2}\ J/s$

24.

Colum 1	Column 2
A. Hypermetropia	p. Bifocal lens
B. Myopia	q. Concave lens
C. Presbyopia	r. Cylindrical lens
D. Asttigmatism	s. Convex lens

	A	B	C	D
(1)	s	p	q	r
(2)	p	r	q	s
(3)	p	r	s	q
(4)	s	q	p	r

Ans. (4)

Sol.

25. A moving body of mass 2 kg, has kinetic energy 16 J. Its momentum is
(1) 8 kg m/s (2) 16 kg m/s (3) 32 kg m/s (4) 64 kg m/s

Ans. (1)

Sol. $p = \sqrt{2mk}$

$= \sqrt{2 \times 2 \times 16}$

$\Rightarrow 8 Nm/s$

26. At one atmospheric pressure, the amount of thermal energy required to convert one kilogram solid into liquid at their melting point is called

(1) latent heat of fusion (2) latent heat of vaporisation

(3) latent heat of sublimation (4) latent heat of condensation

Ans. (1)

Sol.

27. The suitable method for purification of two miscible liquids not having sufficient difference in their boiling points is

(1) filtration (2) fractional distillation (3) sublimation (4) differential extraction

Ans. (2)

Sol.

28. The atomicities of Helium, Oxygen and Ozone are respectively

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

Ans. (3)

Sol. He – 1 (as it is a noble gas)

oxygen $\rightarrow$ 2 (O_2)

Ozone $\rightarrow$ 3 (O_3)

29. Number of molecules present in 8 g of methane is

(1) 6.022×10^{23} (2) 3.011×10^{23} (3) 12.044×10^{23} (4) 8.011×10^{23}

Ans. (2)

Sol. Molecular mass of methane (CH_4) = 12 + 4 = 16 gm

No. of moles of $CH_4 = \frac{\text{given mass}}{\text{molar mass}} = \frac{8}{16} = 0.5$ mol

No. of molecules of CH_4 in 8 gm = $0.5 \times 6.023 \times 10^{23}$

$= 3.011 \times 10^{23}$

30. Maximum number of electrons present in N-shell of atom is

(1) 8 (2) 18 (3) 50 (4) 32

Ans. (4)

Sol. n = 4 (for N shell)

max. no of electrons in N shell = $2n^2$

$= 2 \times (4)^2$

$= 2 \times 16$

$= 32$

31. The radioactive isotope used in the treatment of goitre diseases is

(1) Cobalt-60 (2) Iodine-131 (3) Sodium-24 (4) Chlorine-37

Ans. (2)

Sol.

32. Molecular formula of Mercurous nitrate is

(1) $Hg(NO_3)_2$ (2) $Hg(NO_3)_3$ (3) $HgNO_3$ (4) Hg_2NO_3

Ans. (3)

Sol. mercurous nitrate

Hg^{+1} NO_3^{-1}

Molecular formula

Hg $\times$ NO_3

+1 –1

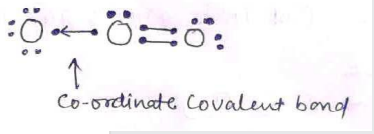
$= HgNO_3$

33. Number of coordinate covalent bonds in ozone molecule is

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

Ans. (4)

Sol. structure of ozone $\rightarrow$ 1 coordinate covalent bond



34. The compound [X is obtained by treating calcium oxide with water. The molecular formula of compound $[X]$ is

(1) Cao (2) $Ca(OH)_2$ (3) $CaCO_3$ (4) $CaSO_4$

Ans. (2)

Sol. $CaO + H_2O \longrightarrow Ca(OH)_2$

Lime water

35. Pair of valencies exhibited by Lead (Pb) is

(1) 1,2 (2) 2, 3 (3) 2, 4 (4) 2, 5

Ans. (3)

Sol.

36. Atomic number and mass number of an element $[X]$ are 11 and 23 respectively. The number of neutrons present in element $[X]$ will be

(1) 10 (2) 11 (3) 12 (4) 23

Ans. (3)

Sol. ${}_{11}X^{23}$

no. of neutron = A – Z

= 23 – 11

= 12

37. First Indian scientist honoured by Nobel prize is

(1) Meghnad Saha (2) Hargobind Khorana (3) S. Chandrashekhar (4) C. V. Raman

Ans. (4)

Sol.

38. Lewis base among the following is

(1) BF_3 (2) $AlCl_3$ (3) Na^+ (4) Cl^-

Ans. (4)

Sol.

39. The formula of the salt used in purification of water among the following is

(1) $K_2SO_4 . Al_2 (SO_4)_3 . 6H_2O$ (2) $K_2SO_4 . Al_2 (SO_4)_3 . 24H_2O$

(3) $KCl . MgCl_2 . 6H_2O$ (4) $FeSO_4 . (NH_4)_2 SO_4 . 6H_2O$

Ans. (2)

Sol. Potash atom is used for water purification.

formula - $K_2SO_4 . Al_2 (SO_4)_3 . 24H_2O$

40. The compound of calcium used for joining the broken bones is

(1) $CaSO_4$ (2) $CaSO_4 . 2H_2O$ (3) $CaSO_4 . \frac{1}{2} H_2O$ (4) $CaCO_3$

Ans. (3)

Sol.

41. Arrange the following elements in increasing order of their reactivity :

Mg, K, Zn, Cu

(1) K < Mg < Zn < Cu (2) Zn < Mg < Cu < K (3) CU < Zn < Mg < K (4) Mg < K < Zn < Cu

Ans. (3)

Sol.

42. The pH of solution obtained by taking equal mole of reactants in the following reaction will be

$CH_3COOH + NaOH \rightarrow CH_3COONa + H_2O$

(1) 7.0 (2) above 7.0 (3) below 7.0 (4) zero

Ans. (2)

Sol. $CH_3COOH + NaOH \longrightarrow CH_3COONa + H_2O$

weak	strong	Basic
acid	base	salt

CH_3COONa is basic salt so solution having pH more than 7.

43. The $[X]$ in the following reaction is

$[X] + \text{Coloured substance} \rightarrow \text{Colourless substance}$

(1) Molecular oxygen (2) Atomic oxygen (3) Ozone (4) Atomic chlorine

Ans. (2)

Sol. $H_2O + Cl_2 \longrightarrow 2HCl + [O]$

$\downarrow$

Atomic oxygen

44. The periodic property which increases on going from top to bottom in the groups of periodic table is

(1) Ionisation enthalpy (2) Electron gain enthalpy

(3) Atomic radius (4) Electronegativity

Ans. (3)

Sol. Ionisation enthalpy, electron gain enthalpy & electronegativity decreases as we go down the group. 0 only atomic radius increases due to addition of new shell.

45. Correct decreasing order of atomic radii of the following elements is

Li, C, B O

(1) Li > C > B > O (2) O > C > B > Li (3) O > Li > B > C (4) Li > B > C > O

Ans. (4)

Sol. as we move from left to right in a period atomic radius decreases.

46. The period related to lanthanoids in modern periodic table is
(1) fifth (2) sixth (3) seventh (4) eight
Ans. (2)
Sol.

47. Pair of monomers of polymer terylene is
(1) Terephthalic acid and Ethylene (2) Adipic acid and Ethylene glycol
(3) Terephthalic acid and Ethylene glycol (4) Adipic acid and Hexamehtylene diamine
Ans. (3)
Sol.

48. Allotrope of carbon used as superconductor at high temperature is
(1) Diamond (2) Graphite (3) Charcoal (4) Fullerene
Ans. (4)
Sol.

49. Name of chlorofluorocarbon CF_2Cl_2 is
(1) Freon-11 (2) Freon-12 (3) Freon-112 (4) Freon-122
Ans. (2)
Sol.

50. The ratio of numbers of carbon and hydrogen atoms in cyclohexane is
(1) 1 : 1 (2) 2 : 1 (3) 1 : 2 (4) 2 : 3
Ans. (3)
Sol. cyclohexane chemical formula = C_6H_{12}
C : H
6 : 12
1 : 2

51. Genetic material in plant virus is
(1) Double helicle DNA (2) RNA (3) DNase (4) RNase
Ans. (2)
Sol. The genetic material of most organisms is double strauded DNA . TMV is a plant virus . The genetic material of a plant virus is **RNA**.

52. Lignified cell in plants is
(1) Vessel (2) Xylem parenchyma (3) Sieve tube (4) Companion cell
Ans. (1)
Sol. Xylem parenchyma,sieve tubes and companion all are living (vessel lignin that provides rigidity)

53. The kingdom related with Prokaryotic organism is
(1) Protista (2) Monera (3) Fungi (4) Plantae
Ans. (2)
Sol. Monera includes all prokaryotes

54. Which division of plants is known as amphibians of plant kingodm?
(1) Thallophyta (2) Bryophyta (3) Pteridophyta (4) All of these
Ans. (2)
Sol. Bryophyte grows on land and need water for fertilization

55. Which plant has mycorrhiza?
(1) Cycas (2) Pinus (3) Pea (4) Equisetum
Ans. (2)

Sol. Pinus is a gymnosperm. Its root shows symbiosis & mycorrhiza means association of fungus with roots of higher plants.

56. From which plant part is Ashwagandha medicine obtained?
(1) Root (2) Stem (3) Leaf (4) Fruit
Ans. (1)
Sol. Botanical name of ashwagandha is withania somnifera. Its root and fruits have medicinal importance

57. The chemical used in the preparation of pain relief medicine is
(1) Codeine (2) Nicotine (3) Caffeine (4) Tannin
Ans. (1)
Sol. Codience is an opiate used to treat pain,as a cough medicine and for diarrhea

58. The generation which first of all expresses dominant characters in hybridization experiment is
(1) Parental generation (2) F_1 generation (3) F_2 generation (4) F_3 generation
Ans. (2)
Sol. Law of dominance F1 only dominant characters express

59. In which state is Kaziranga National park located ?
(1) West Bengal (2) Kerala (3) Assam (4) Gujarat
Ans. (3)
Sol. Kaziranga Asam

60. The first human astronaut in space was
(1) Neil Armstrong (2) Michael Collins (3) Yuri Gagarin (4) Alan Shepard
Ans. (3)
Sol. Yuri Gagarin

61. Presence of jointed appandages is feature of which phylum?
(1) Annelida (2) Mollusca (3) Arthropoda (4) Echinodermata
Ans. (3)
Sol. Arthropoda means jointed appendages , it include all insects

62. Excretory organ in earthworm is
(1) Kidney (2) Nephridia (3) Malpighian tubules (4) Flame cells
Ans. (2)
Sol. Earthworm (annelid) excretory organ Nephridia

63. Imbalance secretion of which hormone results in Goitre ?
(1) Thyroxine (2) Thymosin (3) Insulin (4) Adrenaline
Ans. (1)
Sol. Thyroxine released by Thyroid gland

64. Protozoan disease is
(1) Leprosy (2) Poliomyelitis (3) Jaundice (4) Malaria
Ans. (4)
Sol. It is caused by plasmodium, Which is a protozoa

65. In which phase of cell cycle does DNA synthesis take place?
(1) G-1 phase (2) S phase (3) M phase (4) G-2 phase
Ans. (2)
Sol. Interphase
G1 Phase (Growth phase)
S (DNA Synthesis)
G2 (Growth phase ll)

66. Which of the following glands is endocrine as well as exocrine?
(1) Pituitary gland (2) Thyroid gland (3) Adrenal gland (4) Pancreas
Ans. (4)
Sol. Pancreas is a dual gland , it secretes harmone as well play role in digestion

67. Thecodont and diphyodont dentition is found in
(1) Reptilia (2) Mammalia (3) Amphibia (4) Pisces
Ans. (2)
Sol. Thewdant Teeth fixes in socket
Diphywdent two set of teeth

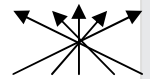
1.Tempory 2. Permanent

68. Antibody found in mother's milk is
(1) IgG (2) IgM (3) IgA (4) IgE
Ans. (3)
Sol. Mother's milk called colosium lgA antibody present in it

69. Coral belongs to which phylum ?
(1) Ctenophora (2) Coelenterata (3) Porifera (4) Mollusca
Ans. (2)
Sol. Coelenterata / Cridaria

70. The disease caused by deficiency of Vitamin C is
(1) Night blindness (2) Beri-Beri (3) Scurvy (4) Rickets
Ans. (3)
Sol. Vitamin C deficiency dieses **Scurvy**

71. Dvandva yoga of 34567 is
(1) 110 (2) 115 (3) 120 (4) 125
Ans. (2)
Sol. **3 4 5 6 7**



3 4 5 6 7
3 × 7 + 3 × 7 + 4 × 6 + 4 × 6 + 5 × 5
21 + 21 + 24 + 24 + 25
42 + 48 + 25 = 115

72. If $\frac{1-2\sqrt{3}}{2-\sqrt{3}} = 4a - b\sqrt{3}$, where a and b are rational then the value of $(a - b)^2$ is
(1) 25 (2) 16 (3) 4 (4) 9
Ans. (2)
Sol. $\frac{1-2\sqrt{3}}{2-\sqrt{3}} \times \frac{2+\sqrt{3}}{2+\sqrt{3}} = \frac{2-4\sqrt{3}+\sqrt{3}-2\times 3}{4-3}$

$4a - b\sqrt{3} = -4 - 3\sqrt{3}$ a = –1
b = +3

$(a-b)^2 = (-1+3)^2 = 16$

73. The value of $\overline{1.324}$ is
(1) $\frac{1311}{990}$ (2) $\frac{1113}{990}$ (3) $\frac{1312}{990}$ (4) $\frac{1213}{990}$
Ans. (1)

Sol. $\frac{1.324-13}{990}=\frac{1311}{990}$

74. Which of the following numbers is subtracted from the polynomial $p(x) = 2x^4 - 3x^3 + 3x + 1$ having a factor $(x + 1)$?

(1) –3 (2) +2 (3) +3 (4) –2

Ans. (3)

Sol. $p(x)=2x^4-3x^3+3x+1$

$p(-1)=2(-1)^4-3(-1)^3+3(-1)+1$

$= 2 + 3 – 3 + 1$

$= 6 – 3$

$= 3$

75. Sum of three consecutive odd numbers is 45. Then the greatest number is

(1) 19 (2) 15 (3) 13 (4) 17

Ans. (4)

Sol. $(2x+1)+(2x+3)(2x+5)=45$

76. If zeros of a quadratic polynomial are 7 and $-\frac{1}{3}$, then the quadratic polynomial will be

(1) $3x^2 + 20x – 7$ (2) $3x^2 – 20x – 7$ (3) $3x^2 – 20x + 7$ (4) $3x^2 + 20x + 7$

Ans. (2)

Sol. $x^2-\left(7-\frac{1}{3}\right)x-\frac{7}{3}$

$x^2-\frac{20}{3}x-\frac{7}{3}$

$3x^2-20x-7$

77. The 8th term of the A.P. series $\left(24+7\sqrt{3}\right), \left(21+6\sqrt{3}\right), \left(18+5\sqrt{3}\right)$, ... is

(1) –3 (2) +3 (3) 0 (4) $\left(3+\sqrt{3}\right)$

Ans. (2)

Sol. $a=24+7\sqrt{3}$

$d=-3-\sqrt{3}$

$a_8=a+(n-1)d$

$=24+7\sqrt{3}+(8-1)\times\left(-3-\sqrt{3}\right)$

$=24+7\sqrt{3}-21-7\sqrt{3}$

$= 3$

78. If the roots of quadratic equation $5x^2 – 10x + k = 0$ are real and equal, then value of k will be

(1) +5 (2) –10 (3) +10 (4) –5

Ans. (1)

Sol. $D = 0$

$(–10)^2 – 4 × 5 × k = 0$

$100 – 20k = 0$

$100 = 20 k$

$k = 5$

79. If the circumference of a circle is 30 cm more than its diameter, then the area of the circle is $\left(\pi = \frac{22}{7}\right)$

(1) 38.5 cm^2 (2) 77 cm^2 (3) 154 cm^2 (4) 225 cm^2

Ans. (3)

Sol. $2\pi r = 2r + 30$

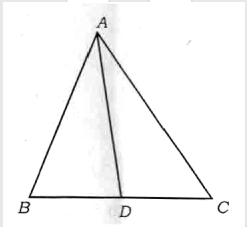
$2r\left(\frac{22}{7} - 1\right) = 30$

$2r \times \frac{15}{7} = 30$

$r = 7$

$A = \frac{22}{7} \times 7 \times 7 = 154 \text{ cm}^2$

80. In the following diagram AD is bisector of angle A, AB = 8 cm, AC = 6.4 cm, DC = 4 cm. Then the value of BD is



(1) 6 cm (2) 4 cm (3) 5 cm (4) 8 cm

Ans. (3)

Sol. $\frac{AB}{AC} = \frac{BD}{DC}$

$\frac{8}{6.4} = \frac{BD}{4}$

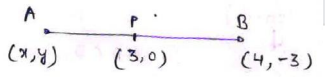
$BD = 5cm$

81. If the coordinate of one end of a line segment is (4, –3) and the coordinate of mid-point is (3, 0) then the coordinate of other end is

(1) (–2, 3) (2) (2, –3) (3) (–2, –3) (4) (2, 3)

Ans. (4)

Sol.



Let the coordinates of A be (x, y)

so, by section formula,

$\frac{x+4}{2} = 3$ $\frac{y-3}{2} = 0$

$x = 2$ $y = 3$

$\therefore$ coordinates of A be (2, 3)

82. If $\cos(A+B) = \frac{1}{2}$ and $\sin(A-B) = \frac{1}{2}$, where $0° < (A+B) \le 90°$, $A > B$, then the value of A will be

(1) 15° (2) 45° (3) 30° (4) 60°

Ans. (2)

Sol. $\cos(A+B) = \frac{1}{2} = \cos 60°$ $\sin(A-B) = \frac{1}{2} = \sin 30°$

$A + B = 60°$ .... (1) $\quad A - B = 30°$ .... (2)

from (1) & (2)

$A = 45°$

$B = 15°$

83. If $\tan\theta = \frac{1}{\sqrt{3}}$, then the value of $\frac{1-\sin^2\theta}{2-\cos^2\theta}$ will be

(1) $\frac{2}{5}$ (2) $\frac{4}{5}$ (3) $\frac{1}{5}$ (4) $\frac{3}{5}$

Ans. (4)

Sol. $\tan\theta = \frac{1}{\sqrt{3}} = \tan 30°$ $\Rightarrow \frac{1-\sin^2\theta}{2-\cos^2\theta}$

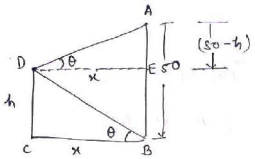
$\theta = 30°$ $= \frac{\cos^2\theta}{1+\sin^2\theta} = \frac{3/4}{1+\frac{1}{4}}$

$= \frac{3/4}{5/4} = \frac{3}{5}$

84. If the angle of elevation of the top of a tower whose height is 50 m from the top of the pole and the angle of depression of the foot of the tower from the top of the pole are equal, then the height of the pole is

(1) 100 m (2) 75m (3) 25m (4) 50m

Ans. (3)



Sol.

In ΔAED,

$\tan\theta = \frac{50-h}{x}$....(1)

In ΔDCB

$\tan\theta = \frac{h}{x}$....(2)

From (1) & (2)

$\frac{50-h}{x} = \frac{h}{x}$

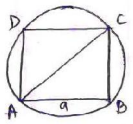
$2h = 50$

$h = 25$ m

85. A square of which are is 128 cm^2, is inside a circle, then the value of radius of the circle is

(1) 16cm (2) 8cm (3) 45cm (4) 12cm

Ans. (2)



Sol.

According to question, AC must be diagonal

Area of ABCE = 128 cm^2

$a^2 = 128$

$a = 8\sqrt{2}$

$\Rightarrow AC = a\sqrt{2} = 8\sqrt{2} \times \sqrt{2} = 16\,cm$

Hence radius = $\frac{16}{2} = 8\,cm$

86. The volume and the area of the curved surface of cylinder are 2618 cm^3 and 748 cm^2 respectively. The the height of the cylinder is

(1) 17 cm (2) 7cm (3) 15 cm (4) 22cm

Ans. (1)

Sol. volume = $\pi r^2 h = 2618$

$\frac{22}{7} \times r^2 \times h = 2618$

$rh \times r = \frac{2618 \times 7}{22}$

put rh = 119

$r = \frac{2618 \times 7}{22 \times 119} = 7$

curved surface area = $2\pi rh = 748$

$2 \times \frac{22}{7} \times rh = 748$

$rh = \frac{748 \times 7}{2 \times 22}$

rh = 7 × 17

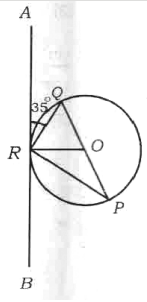
87. The point of concurrency of perpendicular bisectors of the sides of a triangle is known as

(1) Centre of gravity (2) Orthocentre (3) Incentre (4) Circumcentre

Ans. (4)

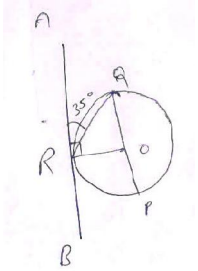
Sol. intersection point of perpendicular bisector is called circumcentre.

88. In the following diagram AB is a tangent at R on a circle having centre O. If $\angle QRA = 35°$, then the value of $\angle QOR$ is



(1) 35° (2) 110° (3) 55° (4) 70°

Ans. (4)



Sol.

since $OR \perp AR$ (AR is tangent)

$\angle ARO = 90°$

$\angle ARQ + \angle QRO = 90°$

$\angle QRO = 90° - 35° = 55°$

OR = OQ (radius)

$\angle QRO = \angle RQO = 55°$

$\angle QOR + \angle QRO + \angle RQO = 180°$

$\angle QOR + 110° = 180°$

$\angle QOR = 70°$

89. The median of the following data is
17, 21, 23, 25, 20, 19, 22, 24, 26, 18
(1) 22.5 (2) 21.5 (3) 20.5 (4) 23.5

Ans. (2)

Sol. Arrange in ascending order -
17, 18, 19, 20, 21, 22, 23, 24, 25, 26
no of data = 10

so median = $\frac{5\text{th} + 6\text{th term}}{2}$

$= \frac{21+22}{2}$

$= \frac{43}{2}$

median = 21.5

90. Two dice are thrown at the same time. What is the probability that the sum of the numbers appearing on the tops of the dice is 7?

(1) $\frac{1}{6}$ (2) $\frac{1}{9}$ (3) $\frac{1}{36}$ (4) $\frac{5}{36}$

Ans. (1)

Sol. 1 + 6 = 7
6 + 1 = 7
4 + 3 = 7
3 + 4 = 7
5 + 2 = 7
2 + 5 = 7
Total possible case 6

probability $= \frac{6}{\text{total}} = \frac{6}{36} = \frac{1}{6}$