| 1. | If ω | is an imaginary | cube 1 | root of unity | y, then (1+0 | ο-ω ²) ⁷ equals | | | |
|----|-------------|---|---------------------------------------|---------------|---------------|--|-------------|-----------------|------|
| | (A) | 128 ω | (B) | -128ω | (C) | $128 \omega^2$ | (D) | $-128 \omega^2$ | |
| 2. | If A | $= \begin{pmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{pmatrix}$ | $\left(\theta \right), \text{ the }$ | n which of t | the followin | g statement | is not cor | rect? | |
| | (A) | A is orthogona | al matr | ix | (B) | A' is orthog | onal mat | rix | |
| | (C) | Determinant | A=1 | | (D) | A is not inv | vertible | | |
| 3. | star | article of mass ts from rest an nds? | | | | | | - | |
| | (A) | (2,4,5) | (B) | (4,8,10) | (C) | (6,12,15) | (D) | (10,0,0) | |
| 4. | | ody completes lacement to dis | | | | dius R in 2 | 0 second | s. The ratio | of |
| | (A) | 7:11 | (B) | 10:1 | (C) | 11:7 | (D) | 1:10 | |
| 5. | | ody falls freely nd of motion ar | | | e distance o | covered in th | e first, se | econd and th | ird |
| | (A) | 1:2:3 | (B) | 1:4:9 | (C) | 1:3:5 | (D) | 2:4:6 | |
| 6. | Whi | ch of the waves | does n | ot belong t | o electroma | gnetic wave | spectrum | ? | |
| | (A) | X-rays | | | (B) | Visible ligh | t | | |
| | (C) | Sound waves | | | (D) | Infra-red ra | ays | | |
| 7. | | ch is the essent sources of light | | dition for p | producing st | tationary Int | erference | e pattern due | e to |
| | (A) | Coherent | | | (B) | Incoherent | | | |
| | (C) | Monochromat | ic | | (D) | Both (A) an | d (C) | | |
| 8. | Ben | ding of light are | ound a | obstacle is l | known as | | | | |
| | (A) | diffraction | | | (B) | reflection | | | |
| | (C) | polarization | | | (D) | none of the | above | | |
| 9. | Mira | age formation is | due to | the variat | ion of layer: | s of | | | |
| | (A) | refractive inde | ex | | (B) | colour | | | |
| | (C) | frequency | | | (D) | none of the | above | | |
| | | | | | | | | | |

| 1. | If ω is an imaginary cube root of unity, | then $(1+\omega-\omega^2)^7$ equals |
|----|--|--|
| | (A) 128 ω (B) -128 ω | (C) $128 \omega^2$ (D) $-128 \omega^2$ |
| | (acc, 0, cir, 0) | |
| 2. | If $A = \begin{pmatrix} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{pmatrix}$, then which of the | e following statement is not correct? |
| | (A) A is orthogonal matrix | (B) A' is orthogonal matrix |
| | (C) Determinant A=1 | (D) A is not invertible |
| 3. | | a force of (4i+8j+10k) Newton. If the particle nitially, what are it new coordinates after 3 |
| | (A) (2,4,5) (B) (4,8,10) | (C) (6,12,15) (D) (10,0,0) |
| 4. | A body completes one round of a cir displacement to distance after 10 secon | ccle of radius R in 20 seconds. The ratio of ds is |
| | (A) 7:11 (B) 10:1 | (C) 11:7 (D) 1:10 |
| 5. | A body falls freely under gravity. The second of motion are in the ratio | distance covered in the first, second and third |
| | (A) 1:2:3 (B) 1:4:9 | (C) 1:3:5 (D) 2:4:6 |
| 6. | Which of the waves does not belong to | electromagnetic wave spectrum? |
| | (A) X-rays | (B) Visible light |
| | (C) Sound waves | (D) Infra-red rays |
| 7. | Which is the essential condition for protocol two sources of light? | oducing stationary Interference pattern due to |
| | (A) Coherent | (B) Incoherent |
| | (C) Monochromatic | (D) Both (A) and (C) |
| 8. | Bending of light around a obstacle is ki | nown as |
| | (A) diffraction | (B) reflection |
| | (C) polarization | (D) none of the above |
| 9. | Mirage formation is due to the variatio | on of layers of |
| | (A) refractive index | (B) colour |
| | (C) frequency | (D) none of the above |
| | | |

10. A hollow metal sphere of radius 5 cm is charged such that the potential on its surface is 10 volts. The potential at the centre of the sphere is

(A) zero

(B) 10 V

(C) same as at a point 5 cm away from the surface

- (D) same as at a point 25 cm away from the surface
- 11. A charge q is placed at the centre of the line joining two equal charges Q. The system of three charges will be in equilibrium if q is equal to

(A) -Q/4 (B) -Q/2 (C) +Q/4 (D) +Q/2

12. An electron of mass m_e, initially at rest, moves through a certain distance in a uniform electric field in time t₁. A proton of mass m_p, also, initially at rest, takes time t₂ to move through an equal distance in this uniform electric filed. Neglecting the effect of gravity, the ratio t₂/t₁ is nearly equal to

(A) 1.0 (B) $(m_p/m_e)^{0.5}$ (C) $(m_s/m_p)^{0.5}$ (D) 1836

- Sodium has 11 electrons. If the sequence in which the energy levels are filled is 1s, 2s, 2p, 3s, 3p, 4s, 3d,... the ground state of sodium is
 - (A) ${}^{3}P_{1/2}$ (B) ${}^{2}P_{1/2}$ (C) ${}^{1}P_{1/2}$ (D) ${}^{3}S_{1/2}$

14. The maximum kinetic energy of electrons in a photoelectric effect depends on

- (A) intensity of incident light (B) frequency of the incident light
- (C) polarization of the incident light (D) angle of incidence

15. Electromagnetic radiations will be emitted in the case of a

(A) neutron moving in a straight line with a constant speed

- (B) proton is moving in straight line with a constant speed
- (C) proton moving in a circle with a constant speed
- (D) electron moving in a straight line with a constant speed
- 16. The de Broglie wave length of an electron of Kinetic energy 500 eV is

| (A) 14 | 4.82 Å | (B) | 24.82 A | (C) | 34.82 Å | (D) | 44.82 A |
|--------|--------|-----|---------|-----|---------|-----|---------|
|--------|--------|-----|---------|-----|---------|-----|---------|

 The maximum number of electrons in an atomic orbit of principal quantum number n = 3 is

(A) 3 (B) 6 (C) 9 (D) 18

| 18. | | ensitive galvano: stance in ——— | | | | nmeter by con | necting | a |
|-----|------|---|----------|-----------------|--------------------|-------------------|-----------|----------------------------|
| | (A) | Low, parallel | | 2 R | (B) | Low, series | | |
| | (C) | High, parallel | | | (D) | High, series | | |
| 19. | The | intensity of the | magne | etic field H a | at a point o | on the axial line | e of a ba | ar magnet is |
| | (A) | $2Md/(d^2{-}l^2)^{1/2}$ | (B) | $2Md/(d^2-l^2)$ |) ² (C) | $2Md/(d^2-l^2)$ | (D) | $2Md/(d^2 \text{-} l^2)^3$ |
| 20. | If a | particle is movi | ng in a | a uniform m | agnetic fie | ld, then | | |
| | (A) | its momentum | chang | ges but total | energy rei | nains same | | |
| | (B) | both momentu | m and | total energy | y remains | the same | | |
| | (C) | its total energ | y chan | ges but mon | nentum rei | nains same | | |
| | (D) | both momentu | m and | total energ | y will chan | ge | | |
| 21. | ΜL | ² T ⁻² is the dimer | nsional | formula of | | | | |
| | (A) | angular mome | ntum | k.; | (B) | linear momer | ntum | |
| | (C) | angular veloci | ty | | (D) | none of the al | bove | |
| 22. | Whi | ch of the followi | ng qua | antity has th | ne same din | nensions as the | e latent | heat? |
| | (A) | Work per unit | mass | | (B) | Specific heat | per uni | t mass |
| | (C) | Force per unit | veloci | ty | (D) | Acceleration | per unit | t displacement |
| 23. | | object is projecte ke the ground in | | | velocity of | 10 m/sec. If g = | = 10 m/s | sec², then it wi |
| | (A) | 1 sec | (B) | 2 sec | (C) | 3 sec | (D) | 5 sec |
| 24. | * | assenger (facing ind him, the tra | | | | ses a coin in a | train. | If the coin fall |
| | (A) | an acceleratio | n | | (B) | retardation | | |
| | (C) | uniform speed | | | (D) | any of these | | |
| 25. | An | electron in Bohr | 's orbit | t has a const | ant (i) acc | eleration (ii) M | omentu | m (iii) force |
| | (A) | (i) only | (B) | (ii) only | (C) | (iii) only | (D) | none of these |
| 26. | Kin | etic energy per g | gram n | nolecule is g | iven by | | | |
| | (A) | 3/2 RT | (B) | 3/2 KT | (C) | 5/2 KT | (D) | $1/2 \mathrm{KT}$ |
| 380 | | | | | 4 | | | |

27. A gas will behave as an ideal gas at

(A) High pressure and low temperature

(B) High temperature and high pressure

(C) At very low pressure and high temperature

(D) None of these

 The resistance of a device dropped drastically when the polarity of the meter changed. The device could be a

(A) Resistor (B) Inductor (C) Capacitor (D) Diode

29. The half life period of neutron is 13 minutes approximately. The intensity of neutron beam traveling in free space with a velocity of 30 km per sec is reduced to half when it cover a distance of

(A) 390000 km (B) 11700 km (C) 46800 km (D) 23400 km

30. Magnetic field does not cause deflection in

(A) γ -rays (B) β -rays (C) β +-rays (D) α -rays

31. Which of the following represents the possible oxidation states of iodine in its compounds?

(A) -1, 0
(B) -1, +1, +2, +3, +4, +5, +6, +7
(C) -1, +1, +3, +5, +7
(D) -1, -3, -5, -7

32. Which of the following metal ion is essential for blood coagulation?

(A) Iron (B) Phosphorous

(C) Potassium (D) Calcium

33. Oxide of which of the elements among Mn, Pb, S, and Ba in its highest oxidation state will be acidic as well as oxidizing?

(A) Sulphur (B) Manganese (C) Lead (D) Barium

34. The hybridization and geometry of the molecule XeOF2 is

(A) sp³d, T shaped (B) sp³, tetrahedral

(C) dsp², square planar (D) sp², trigonal planar

 $\mathbf{5}$

| A nuclear reaction between ^{14}N and ^{4}He balanced equation for the reaction is | produ | aces ^{17}O as one of the products. The |
|--|---|--|
| (A) ${}^{14}N + {}^{4}He \longrightarrow {}^{17}O + {}^{1}p + \gamma$ | | |
| (B) ${}^{14}N + {}^{4}He \longrightarrow {}^{17}O + {}^{1}n + \beta$ | 3 | |
| (C) ${}^{14}N + {}^{4}He$ ${}^{17}O + {}^{1}n + \gamma$ | 1 | |
| (D) ${}^{14}N + {}^{4}He$ ${}^{17}O + \alpha + \gamma$ | | |
| Which among the following halides is not | a Lewi | is acid? |
| (i) CCl ₄ (ii) BCl ₃ (iii) SnCl ₂ (iv) InB | r3 | |
| (A) (ii) (B) (i) | (C) | (iv) (D) (iii) |
| Third ionization energy of titanium is reprocesses? | quired | d to carry out which of the following |
| $(A) Ti^{3+}(g) + e^- \rightarrow Ti^{2+}(g)$ | (B) | $Ti^{2*}(g) \rightarrow Ti^{3+}(g) + e^{-}$ |
| $(C) 3Ti~(g) \rightarrow ~Ti^{\scriptscriptstyle +}(g)~+ 3~e^{\scriptscriptstyle -}$ | (D) | $\mathrm{Ti}~(g) \rightarrow ~\mathrm{Ti}^{3\text{+}}(g) ~+~ 3e^{\text{-}}$ |
| Which of the following ion has longest rad | ius? | |
| (A) Ca ²⁺ (B) K ⁺ | (C) | S ²⁻ (D) Cl ⁻ |
| | 1.0 | |
| (A) 58 (B) 72 | (C) | 71 (D) 56 |
| | | |
| (A) F ₂ O, fluorine oxide | (B) | OF2, Oxygen fluoride |
| (C) OF, Oxygen monofluoride | (D) | FO, Fluorine monoxide |
| Which of the following halide will readily | underg | go hydrolysis? |
| (A) CCl ₄ (B) SiCl ₄ | (C) | NaCl (D) HCl |
| Which of the following compounds would h | nave tł | ne highest boiling point? |
| $(A) CH_3CH_2CH_2CH_3$ | (B) | CH ₃ NH ₂ |
| (C) CH ₃ OH | (D) | $\mathrm{CH}_{2}\mathrm{F}_{2}$ |
| 6 | | |
| | balanced equation for the reaction is (A) ¹⁴ N + ⁴ He \rightarrow ¹⁷ O + ¹ p + γ (B) ¹⁴ N + ⁴ He \rightarrow ¹⁷ O + ¹ n + β (C) ¹⁴ N + ⁴ He \rightarrow ¹⁷ O + ¹ n + γ (D) ¹⁴ N + ⁴ He \rightarrow ¹⁷ O + α + γ Which among the following halides is not β (i) CCl ₄ (ii) BCl ₃ (iii) SnCl ₂ (iv) InB (A) (ii) (B) (i) Third ionization energy of titanium is re- processes? (A) Ti ³⁺ (g) + e ⁻ \rightarrow Ti ²⁺ (g) (C) 3Ti (g) \rightarrow Ti ⁺ (g) + 3 e ⁻ Which of the following ion has longest rad (A) Ca ²⁺ (B) K ⁺ An element present in 6 th period 3 rd gro- number of the element present in 6 th period (A) 58 (B) 72 Which of the following statement is corre- binary compound between oxygen and fluc (A) F ₂ O, fluorine oxide (C) OF, Oxygen monofluoride Which of the following halide will readily γ (A) CCl ₄ (B) SiCl ₄ Which of the following compounds would F (A) CH ₃ CH ₂ CH ₂ CH ₃ (C) CH ₃ OH | balanced equation for the reaction is (A) ${}^{14}N + {}^{4}He \longrightarrow {}^{12}O + {}^{1}p + \gamma$ (B) ${}^{14}N + {}^{4}He \longrightarrow {}^{17}O + {}^{1}n + \beta$ (C) ${}^{14}N + {}^{4}He \longrightarrow {}^{17}O + {}^{1}n + \gamma$ (D) ${}^{14}N + {}^{4}He \longrightarrow {}^{17}O + \alpha + \gamma$ Which among the following halides is not a Lewi (i) CCl ₄ (ii) BCl ₃ (iii) SnCl ₂ (iv) InBr ₃ (A) (ii) (B) (i) (C) Third ionization energy of titanium is required processes? (A) Ti ³⁺ (g) + e ⁻ \rightarrow Ti ²⁺ (g) (B) (C) 3Ti (g) \rightarrow Ti ⁺ (g) + 3 e ⁻ (D) Which of the following ion has longest radius? (A) Ca ²⁺ (B) K ⁺ (C) An element present in 6 th period 3 rd group ha number of the element present in 6 th period 4 th g (A) 58 (B) 72 (C) Which of the following statement is correct with binary compound between oxygen and fluorine? (A) F ₂ O, fluorine oxide (B) (C) OF, Oxygen monofluoride (D) Which of the following compounds would have th (A) CCl ₄ (B) SiCl ₄ (C) Which of the following compounds would have th (A) CH ₃ CH ₂ CH ₂ CH ₃ (B) (C) CH ₃ OH (D) |

43. What is the total number of sigma bonds found in the following compound?

 $H_{3}C \xrightarrow{} C \xrightarrow{} C \xrightarrow{} C \xrightarrow{} C \xrightarrow{} C \xrightarrow{} H$ (B) 10 (C) 11 (D) 15

44. Which one of the following compounds represents the major monochlorination isomer formed in the following reaction?



- 45. The major reason that phenol is a better Brønsted acid than cyclohexanol is
 - (A) it is a better proton donor.

(A) 8

- (B) the cyclohexyl group is an electron donating group by induction, which destabilizes the anion formed in the reaction
- (C) phenol is able to stabilize the anion formed in the reaction by resonance
- (D) the phenyl group is an electron withdrawing group by induction, which stabilizes the anion formed in the reaction.
- 46. Which of the functional groups on the following molecule are susceptible to nucleophilic attack?



- (A) "a" and "b"
- (C) "b" and "c"

(B) "a" and "c"

(D) "b" only

47. The best synthesis of the following compound, 2-methylpropanoic acid, will be...



48. Which of the following is an intermediate for the basic hydrolysis of methyl ethanoate?



49. Which of the following reagents would be the best reactants for the following reaction?



50. What is the major product expected from the following reaction?



56. From the following data :

 $Zn^{2+}(aq) \mid Zn, E^{\circ} = -0.76 V$; $Fe^{3+}(aq), Fe^{2+}(aq) \mid Pt, E^{\circ} = +0.77 V$ it can be deduced that

I. the standard E.M.F. for the cell $Zn | Zn^{2+}(aq) |$ $Fe^{3+}(aq)$, $Fe^{2+}(aq) |$ Pt is 0.01 V.

II. zinc is a more powerful reductant than Fe²⁺ ions.

III. Fe³⁺ can oxidize zinc under standard conditions.

- (A) I and II are correct (B) II and III are correct
- (C) I is the only correct response (D) III is the only correct response
- 57. For which of the following is ΔH° positive?

| I. $O^{+}_{(g)} + e^{\cdot} \rightarrow O_{(g)}$ | | II. $O_{(g)} + e^{\cdot} \rightarrow O^{\cdot}_{(g)}$ | | III. $O^{\text{-}}(g) + e^{\text{-}} \rightarrow O^{2^{\text{+}}}(g)$ | | |
|--|----------------------|---|-----|---|--|--|
| (A) | I and II are correct | | (B) | II and III are correct | | |
| (C) I is the only correct r | | esponse | (D) | III is the only correct respons | | |

58. The amount of carbon dioxide present at equilibrium in the reaction

 $CaCO_{3(s)} \rightarrow CaO_{(s)} + CO_{2(g)} \quad \Delta H^{o}_{298} = +178 \text{ kJ/mole can be increased by}$

- I. raising the temperature
- II. raising the pressure
- III. adding some more solid calcium oxide
- (A) I and II are correct (B) II and III are correct
- (C) I is the only correct response (D) III is the only correct response

59. The Faraday constant is

| (A) | 96500 coulomb | (B) | 95600 coulomb |
|-----|---------------|-----|-----------------------|
| (C) | 96500 ohm | (D) | $6.023 	imes 10^{23}$ |

60. The Bragg's equation for X-ray diffraction by a crystal is

| (A) $n\lambda = 2$ | $2d \sin\theta$ (B) | $n\lambda = 2d \sec\theta$ | (C) | $n\lambda = 2d \theta$ | (D) | $nv = 2d \sin\theta$ |
|--------------------|---------------------|----------------------------|-----|------------------------|-----|----------------------|
|--------------------|---------------------|----------------------------|-----|------------------------|-----|----------------------|

- 61. The product of three positive reals is 1 and their sum is greater than sum of their reciprocals. Exactly one of them is greater than
 - (A) 0 (B) 1 (C) -1 (D) -2

62. If a, b, c are in G.P., then a + b, 2b, b + c are in

- (A) A.P. (B) G.P
- (C) H.P (D) Both A.P and G.P

| 63. | If the fourth root | s of unity are z1, z2, z3, | , z4, then z1 ² | 2 + z_{2}^{2} + z_{3}^{2} + z_{4}^{2} is | s equal to | |
|-----|---|---|----------------------------|---|-----------------------|--------|
| | (A) 1 | | (B) | 0 | | |
| | (C) i | | (D) | none of these | | |
| 64. | If z and ω are (ω) = $\frac{\pi}{2}$, then $\bar{z} \omega$ | two non zero comple is equal to | ex number | s such that $ z\omega $ | $ =1$, and $\arg(2)$ | z)-arg |
| | (A) 1 | (B) -1 | (C) | i | (D) -i | |
| 65. | The value of (1+i | $)^{3} + (1+i)^{6}$ is | | | | |
| | (A) i | (B) 2(-1+5i) | (C) | 1-5i | (D) 1+5i | |
| 66. | If $(x-1)^4 - 16 = 0$, | then the sum of non- | real comple | ex values of x is | | |
| | (A) 2 | (B) 0 | (C) | 4 | (D) 6 | |
| 67. | The value of \log_3 | 5.log ₂₅ 27 is | | | | |
| | (A) 3 | (B) 3/2 | (C) | 1⁄2 | (D) 1 | |
| 68. | The curve repres | ented by $\operatorname{Re}(z^2) = 4$ is | | | | |
| | (A) a parabola | | (B) | an ellipse | | |
| | (C) a circle | | (D) | a rectangular h | ıyperbola | |
| 69. | two class players | ament where the par s fell ill, having playe number of participan | ed 3 games | s each. If the to | | |
| | (A) 22 | | (B) | 15 | | |
| | (C) 17 | | (D) | none of the abo | ve | |
| 70. | number of balls. | s have to be put in Total number of way ast 2 balls, is equal to | ys of puttir | | | |
| | (A) ⁹ C ₅ | (B) ¹⁰ C ₅ | (C) | $^{6}\mathrm{C}_{5}$ | $(D) \ ^{10}C_6$ | |
| 71. | For $2 \le r \le n$, $\binom{n}{r}$ | $+2\binom{n}{r-1}+\binom{n}{r-2}=$ | | | | |

(A) $\binom{n+1}{r-1}$ (B) $2\binom{n+1}{r+1}$ (C) $2\binom{n+2}{r}$ (D) $\binom{n+2}{r}$

73. Of three independent events the chance that only the first occurs is a, that only the second occurs is b, and only the third occurs is c. Then the probability of occurrence of these three events are (where x is a root of the equation), $(a+x)(b+x)(c+x) = x^2$, is

| (A) | a b c | (B) | Ь | a | С |
|-----|--|-----|-------|-----|-------|
| | $\overline{a+x}$, $\overline{b+x}$, $\overline{c+x}$ | (D) | a + x | b+x | c + x |
| (C) | c b a | (D) | С | | ab |
| | $\overline{a+x}, \overline{b+x}, \overline{c+x}$ | (D) | a + x | b+x | c + x |

74. Six faces of a die are marked with the numbers 1, -1, 0, -2, 2 and 3. The die is thrown thrice. The probability that the sum of the numbers thrown is six, is

| (4) | 1 | (P) 1 | 5 | (D) 1 |
|-----|----------------|--------------------|---------------------|--------------------|
| (A) | $\frac{1}{72}$ | (B) $\frac{1}{12}$ | (C) $\frac{5}{108}$ | (D) $\frac{1}{36}$ |

75. If ABC is a triangle and $\tan \frac{A}{2}$, $\tan \frac{B}{2}$, $\tan \frac{C}{2}$ are in H.P, then the minimum value of $\cot \frac{B}{2}$ is equal to

(A)
$$-\sqrt{3}$$
 (B) $\sqrt{3}$ (C) 2 (D) -2

76. The value of y so that the line through (3,y) and (2,7) is parallel to the line through (-1,4) and (0,6) is
(A) 5 (B) -5 (C) 9 (D) -9

77. Area of triangle formed by the lines x + y = 3 and angle bisector of the pair of straight lines x² + y² + 2 y = 1 is
(A) 2 sq. units
(B) 4 sq. units
(C) 6 sq. units
(D) 8 sq. units

78. Lines 3x+4y+6=0, $\sqrt{2}x+\sqrt{3}y+2\sqrt{2}=0$ and 4x+7y+8=0

(A) Concurrent (B) Parallel

(C) Sides of a triangle (D) None of these

79. Let
$$f(x) = 4$$
 and $f_{x}(x) = 4$, then $\lim_{x \to 2} \frac{xf(2) - 2f(x)}{x - 2}$ equals to
(A) 2 (B) -2 (C) -4 (D) 3

80.
$$\lim_{x \to \infty} \left(\frac{x^2 + 5x + 3}{x^2 + x + 3} \right)^x$$
 is equal to
(A) e^4 (B) e^2 (C) e^3 (D) e^4

81.
$$\lim_{x\to 0} \frac{\tan x - \sin x}{x^3} \text{ is equal to}$$
(A) 0 (B) 1 (C) 1/2 (D) -1/2
82. Let $f:(0,+\infty) \to R$ and $F(x) = \int_0^x f(t)dt$. If $F(x^2) = x^2(1+x)$, then $f(4)$ equals
(A) 5/4 (B) 7 (C) 4 (D) 2
83. The function $f(x) = \frac{x}{2} + \frac{2}{x}$ has a local minimum at
(A) $x=-2$ (B) $x=0$ (C) $x=1$ (D) $x=2$
84. If 2a+3b+6c=0, then atleast one root of the equation $ax^2+bx+c=0$ lies
in the interval
(A) $(0, 1)$ (B) $(1, 2)$ (C) $(2, 3)$ (D) $(1, 3)$
85. At what point on the curve $x^3 - 8a^2y = 0$, the slope of the normal is -2/3?
(A) $(2a,-a)$ (B) (a, a) (C) $(2a, a)$ (D) $(-2a,-a)$
86. The real number, which most exceeds its cube, is
(A) $1/2$ (B) $\frac{1}{\sqrt{3}}$ (C) $\frac{1}{\sqrt{2}}$ (D) $1/4$
87. $\int xe^{x^2}dx$ is equal to
(A) $-\frac{e^{x^2}}{2} + C$ (B) $\frac{e^{x^2}}{2} + C$ (C) $\frac{e^x}{2} + C$ (D) $-\frac{e^x}{2} + C$
88. If $y = f(x)$ and $y \cos x + x \cos y = \pi$, then the value of $f'(0)$ is
(A) π (B) $-\pi$ (C) 0 (D) 2π
89. Let $f(0) = \sin \theta + \sin 3 \theta$ then $f(0)$ is
(A) ≥ 0 only when $\theta \ge 0$ (B) ≤ 0 for all real θ
(C) ≥ 0 for all real θ (D) ≤ 0 only when $\theta \le 0$

| | 90. | $\int_{0}^{10\pi} si $ | nx dx is | | | | | | | | | |
|---|------|-------------------------|------------------------------|--------|--------------|---------|-----------|-----------|----------|-----------|----------|-----------------|
| | | (A) | 20 | | (B) | 8 | | (C) | 10 | | (D) | 18 |
| | 91. | Har | ish is a vor | acious | read | er. Th | e meanii | ng of thi | s senten | ce is | | |
| | | | Harish ha | | | | | 1 | Harish | | ots of l | books |
| | | (C) | Harish re | ads or | nly on | e bool | k a day | (D) | Harish | is illite | rate | |
| | 92. | The | verb in the | follow | ving s | enten | ice is | | | | | |
| | | | e tiger is a | | | | | | | | | |
| | | | the | | (B) | | | (C) | is | | (D) | wild |
| - | 93. | The | man jumpe | ed | | t | he fence | | | | | |
| | | | | | | | ne tenee | (C) | out | | (D) | in |
| - | 94. | Laco | identally c | 11t | | | with a kn | ife | | | | |
| | | | myself | | | | elf | | themse | lves | (D) | himself |
| - | 95. | A su | dden illnes | s prev | vented | l the 1 | minister | | att | ending | the ca | binet meeting. |
| | | (A) | | | (B) | | | (C) | | | (D) | |
| | 96. | I hav | ven't seen l | nim — | | | a long ti | me ago. | | | | |
| | | | since | | (B) | | | | after | | (D) | from |
| | 97. | | principal ntaining th | | | | leader | of the | boys — | | r | esponsible for |
| | | (A) | can | | (B) | are | | (C) | were | | (D) | was |
| 0 | 98. | | a, of all the in the next | | | | world, — | | the j | potentia | al to be | e a frontrunner |
| | | (A) | has | | (<u>B</u>) | have | | (C) | are hav | ing | (D) | was having |
| 0 | 99. | I — | | coffee | to tea | | | | | | | |
| | | (A) | like | | (B) | prefe | er | (C) | want | | (D) | desire |
| | 100. | Wha | t is the tim | ne —— | | — у | our wate | h? | | | | |
| | | (A) | by | | (B) | in | | (C) | of | | (D) | on |
| | | | | | | | | | - | 12 | | |