VERY SIMILAR PRACTICE TEST 8

Time : 3 hrs. Max. Marks : 300

PHYSICS

1. Monochromatic light is incident on a glass prism of angle A. If the refractive index of the material of the prism is μ, a ray, incident at an angle θ, on the face AB would get transmitted through the face AC of the prism provided

(a) $\theta > \cos^{-1}\left[\mu \sin\left(A + \sin^{-1}\left(\frac{1}{\mu}\right)\right)\right]$

(b) $\theta < \cos^{-1}\left[\mu \sin\left(A + \sin^{-1}\left(\frac{1}{\mu}\right)\right)\right]$

(c) $\theta > \sin^{-1}\left[\mu \sin\left(A - \sin^{-1}\left(\frac{1}{\mu}\right)\right)\right]$

(d) $\theta < \sin^{-1}\left[\mu \sin\left(A - \sin^{-1}\left(\frac{1}{\mu}\right)\right)\right]$

2. The kinetic energy of a particle executing SHM will be equal to $(1/8)^{th}$ of its potential energy when its displacement from the mean position is (where A is the amplitude)

(a) $A\sqrt{2}$ (b) $A/2$

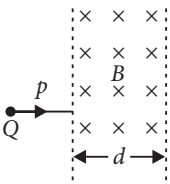
(c) $\frac{2\sqrt{2}}{3}A$ (d) $A\sqrt{\frac{2}{3}}$

3. The current density varies with radial distance r as $J = ar^2$, (where a is a constant) in a cylindrical wire of radius R. The current passing through the wire between radial distance $R/3$ and $R/2$ is,

(a) $\frac{65\pi a R^4}{2592}$ (b) $\frac{25\pi a R^4}{72}$

(c) $\frac{65\pi a^2 R^3}{2938}$ (d) $\frac{81\pi a^2 R^4}{144}$

4. A particle with charge Q, moving with a momentum p, enters a uniform magnetic field normally. The magnetic field has magnitude B and is confined to a region of width d,

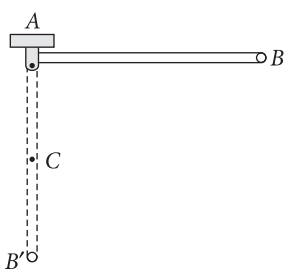


where $d < \frac{p}{BQ}$. The particle is deflected by an angle θ in crossing the field. Then

(a) $\sin\theta = \frac{BQd}{p}$ (b) $\sin\theta = \frac{p}{BQd}$

(c) $\sin\theta = \frac{Bp}{Qd}$ (d) $\sin\theta = \frac{pd}{BQ}$

5. One end of a uniform rod of length l and mass m is hinged at A. It is released from rest from horizontal position AB as shown in figure. The force exerted by the rod on the hinge when it becomes vertical is



(a) $\frac{3}{2}mg$ (b) $3mg$ (c) $5mg$ (d) $\frac{5}{2}mg$

6. A chain of mass M and length l is suspended vertically with its lower end touching a weighing scale. The chain is released and falls freely onto the scale. Neglecting the size of the individual links, what is the reading of the scale when a length x of the chain has fallen?

(a) $\frac{Mgx}{l}$ (b) $\frac{2Mgx}{l}$

(c) $\frac{3Mgx}{l}$ (d) $\frac{4Mgx}{l}$

7. A charge is distributed with a linear density λ over the length L along radius vector drawn from the point where a point charge q is located. The distance between q and the nearest point on linear charge is R. The electrical force experienced by the linear charge due to q is

(a) $\frac{q\lambda L}{4\pi\varepsilon_0 R^2}$ (b) $\frac{q\lambda L}{4\pi\varepsilon_0 R(R+L)}$

(c) $\frac{q\lambda L}{4\pi\varepsilon_0 RL}$ (d) $\frac{q\lambda L}{4\pi\varepsilon_0 L^2}$

8. Find the pressure at which temperature attains its maximum value if the relation between pressure and volume for an ideal gas is $P = P_0 + (1 - \alpha)V^2$.

(a) $\frac{2P_0}{3}$ (b) $\frac{P_0}{3}$ (c) P_0 (d) $\frac{4P_0}{3}$

9. If K_α-radiation of Mo ($Z = 42$) has a wavelength 0.71 Å, the wavelength of the corresponding radiation of Cu($Z = 29$) is equal to

(a) 1.52 Å (b) 0.71 Å

(c) 0.36 Å (d) 2.5 Å

10. The magnetic field of a beam emerging from a filter facing a floodlight is given by $B = 12 \times 10^{-8} \sin(1.20 \times 10^7 z - 3.60 \times 10^{15} t)$T. What is the average intensity of the beam?

(a) 1.25 W m^{-2} (b) 1.72 W m^{-2}

(c) 0.2 W m^{-2} (d) 0.25 W m^{-2}

11. The escape velocity of a planet is v_e. A particle starts from rest at a large distance from the planet, reaches the planet only under gravitational attraction, and passes through a smooth tunnel through its centre. Its speed at the surface of the planet will be

(a) v_e (b) $2v_e$

(c) $1.5\, v_e$ (d) $\sqrt{1.5}v_e$

12. A spherical soap bubble of radius 1 cm is formed inside another bubble of radius 3 cm. The radius of a single soap bubble which maintains the same pressure difference as inside the smaller and outside the larger soap bubble is

(a) 0.75 cm (b) 0.75 m

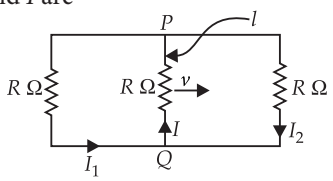
(c) 7.5 cm (d) 7.5 m

13. In Young's double slit experiment, one of the slits is wider than the other, so that the amplitude of the light from one slit is double that from the other slit. If I_m be the maximum intensity, the resultant intensity when they interfere at phase difference ϕ is given by

(a) $\frac{I_m}{3}\left(1+2\cos^2\frac{\phi}{2}\right)$ (b) $\frac{I_m}{5}\left(1+4\cos^2\frac{\phi}{2}\right)$

(c) $\frac{I_m}{9}\left(1+8\cos^2\frac{\phi}{2}\right)$ (d) $\frac{I_m}{9}\left(8+\cos^2\frac{\phi}{2}\right)$

14. A rectangular loop has a sliding connector PQ of length l and resistance $R\ \Omega$ and it is moving with a speed v as shown. The set-up is placed in a uniform magnetic field going into the plane of the paper. The three currents I_1, I_2 and I are



(a) $I_1 = I_2 = \frac{Blv}{6R}, I = \frac{Blv}{3R}$

(b) $I_1 = -I_2 = \frac{Blv}{R}, I = \frac{2Blv}{R}$

(c) $I_1 = I_2 = \frac{Blv}{3R}, I = \frac{2Blv}{3R}$

(d) $I_1 = I_2 = I = \frac{Blv}{R}$

15. A rectangular block of mass m and area of cross-section A floats in a liquid of density ρ. If it is given a small vertical displacement from equilibrium it undergoes oscillation with a time period T. Then

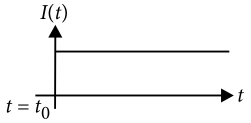
(a) $T \propto \frac{1}{\sqrt{m}}$ (b) $T \propto \sqrt{\rho}$

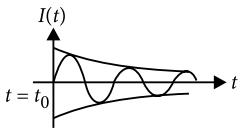
(c) $T \propto \frac{1}{\sqrt{A}}$ (d) $T \propto \frac{1}{\rho}$

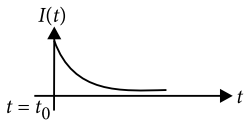
16. A solid sphere of radius R is charged uniformly. At what distance from its surface is the electrostatic potential half of the potential at the centre?

(a) R (b) $\frac{R}{2}$ (c) $\frac{R}{3}$ (d) $2R$

17. A series LR circuit is connected to a voltage source with $V(t) = V_0 \sin\omega t$. After very large time, current $I(t)$ behaves as $\left(t_0 >> \frac{L}{R}\right)$

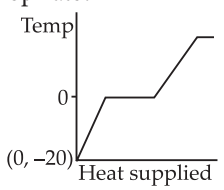
(a) 

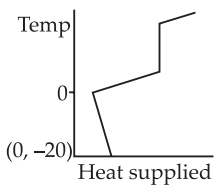
(b) 

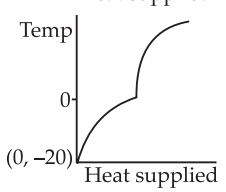
(c) 

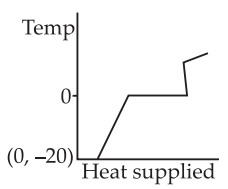
(d) 

18. A block of ice at temperature –20°C is slowly heated and converted to steam at 100°C. Which of the following diagram is most appropriate?

(a) 

(b) 

(c) 

(d) 

19. A modulated signal $C_m(t)$ has the form $C_m(t) = 25 \sin 300\pi t + 15 (\cos 200\pi t - \cos 400\pi t)$. The carrier frequency f_c and the modulating frequency (message frequency) f_ω are respectively given by

(a) $f_c = 200$ Hz; $f_\omega = 50$ Hz
(b) $f_c = 150$ Hz; $f_\omega = 50$ Hz
(c) $f_c = 150$ Hz; $f_\omega = 30$ Hz
(d) $f_c = 200$ Hz; $f_\omega = 30$ Hz

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

(a) Average speed of a particle in a given time period is never less than the magnitude of average velocity.
(b) It is possible to have situations in which $\left|\frac{d\vec{v}}{dt}\right| \neq 0$, but $\frac{d|\vec{v}|}{dt} = 0$.
(c) If the average velocity of a particle is zero in a time interval, then it is possible that the instantaneous velocity is never zero in that interval.
(d) All of these.

NUMERICAL VALUE TYPE

21. A uniformly tapering conical wire is made from a material of Young's modulus Y and has a normal, unextended length L. The radii, at the upper and lower ends of this conical wire, have values R and $3R$, respectively. The upper end of the wire is fixed to a rigid support and a mass M is suspended from its lower end. The equilibrium extended length, of this wire is $L\left(1 + \frac{1}{x}\frac{Mg}{\pi YR^2}\right)$. The value of x is _____.

22. A moving coil galvanometer has 150 equal divisions. Its current sensitivity is 10 divisions m A^{-1} and voltage sensitivity is 2 divisions mV^{-1}. In order that each division reads 1 V, the resistance needed to be connected in series with the coil will be _____ Ω.

23. A motor cycle starts from rest and accelerates along a straight path at 2 m s^{-2}. At the starting point of the motor cycle there is a stationary electric siren (in m). When the driver hears the frequency of the siren at 94% of its value, the motor cycle was at rest then distance travelled by the motor cycle is _____ m. (Speed of sound = 330 m s^{-1}).

24. A pure germanium semiconductor is doped with donor atoms of density 8×10^x cm^{-3} in order to obtain an n-type semiconductor

whose conductivity is 5 mho cm^{-1}. The value of x is _____.
(The mobility of electrons in n-type germanium is 3900 $cm^2\ V^{-1}\ s^{-1}$ and density of holes is negligible.)

25. Two identical cylindrical vessels with their bases at the same level, each contains a liquid of density 1.3×10^3 kg/m^3. The area of each base is 4.0 cm^2, but in one vessel, the liquid height is 0.854 m and in the other it is 1.560 m. The work done by the gravitational force in equalizing the levels when the two vessels are connected is _____ J.

CHEMISTRY

26. Which of the following arrangements is correct in respect of solubility in water?
(a) $CaSO_4 > BaSO_4 > BeSO_4 > MgSO_4 > SrSO_4$
(b) $BeSO_4 > MgSO_4 > CaSO_4 > SrSO_4 > BaSO_4$
(c) $BaSO_4 > SrSO_4 > CaSO_4 > MgSO_4 > BeSO_4$
(d) $BeSO_4 > CaSO_4 > MgSO_4 > SrSO_4 > BaSO_4$

27. Under what conditions gases generally deviate from ideal behaviour?
(a) At high temperature and low pressure
(b) At low temperature and high pressure
(c) At high temperature and high pressure
(d) At low temperature and low pressure

28. Which silicates is formed from SiO_4^{4-} tetrahedral units by sharing three oxygen atoms?
(a) Sheet silicates
(b) Pyrosilicates
(c) Linear chain silicates
(d) Three dimensional silicates

29. In the reaction,
$BrO^-_{3(aq)} + 5Br^-_{(aq)} + 6H^+_{(aq)} \longrightarrow 3Br_{2(aq)} + 3H_2O_{(l)}$
the expression of rate of appearance of bromine $[Br_2]$ to rate of disappearance of bromide ion $[Br^-]$is
(a) $\frac{d[Br_2]}{dt} = -\frac{3}{5}\frac{d[Br^-]}{dt}$
(b) $\frac{d[Br_2]}{dt} = -\frac{5}{3}\frac{d[Br^-]}{dt}$
(c) $\frac{d[Br_2]}{dt} = \frac{5}{3}\frac{d[Br^-]}{dt}$
(d) $\frac{d[Br_2]}{dt} = \frac{3}{5}\frac{d[Br^-]}{dt}$

30. In the reaction :
$S + 3/2\ O_2 \rightarrow SO_3 + 2x$ kcal and
$SO_2 + 1/2\ O_2 \rightarrow SO_3 + y$ kcal,
heat of formation of SO_2 is
(a) $(x + y)$ (b) $(x - y)$
(c) $(2x + y)$ (d) $(2x - y)$

31. A student made the following observations in the laboratory :
(i) Clean copper metal did not react with 1 molar $Pb(NO_3)_2$ solution.
(ii) Clean lead metal dissolved in a 1 molar $AgNO_3$ solution and crystals of Ag metal appeared.
(iii) Clean silver metal did not react with 1 molar $Cu(NO_3)_2$ solution.
The order of decreasing reducing character of the three metals is
(a) Cu, Pb, Ag (b) Cu, Ag, Pb
(c) Pb, Cu, Ag (d) Pb, Ag, Cu

32. The oxidation number of S in the compound $KAl(SO_4)_2 \cdot 12H_2O$ is
(a) + 4 (b) + 2
(c) + 6 (d) + 2.5

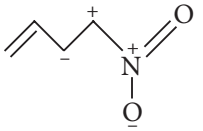
33. For an ideal solution with $p^\circ_A > p^\circ_B$, which of the following is true?
(a) $(x_A)_{liquid} = (x_A)_{vapour}$
(b) $(x_A)_{liquid} > (x_A)_{vapour}$
(c) $(x_A)_{liquid} < (x_A)_{vapour}$
(d) $(x_A)_{liquid}$ and $(x_A)_{vapour}$ do not bear any relationship with each other.

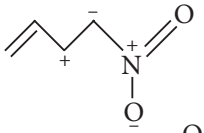
34. Match the list I with list II and select the correct answer using the code given below the lists.

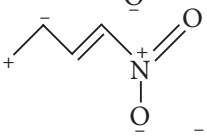
	List I		List II
P.	Phthalein test	1.	Aldehydic group
Q.	Schiff's reagent test	2.	Amino group
R.	Nitrous acid test	3.	Alcoholic group
S.	Xanthate test	4.	Phenolic group

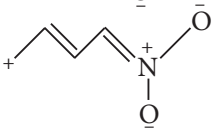
(a) P - 1, Q - 2, R - 3, S - 4
(b) P - 4, Q - 3, R - 2, S - 1
(c) P - 1, Q - 3, R - 2, S - 4
(d) P - 4, Q - 1, R - 2, S - 3

35. Among the following, the least stable resonance structure is

(a) 

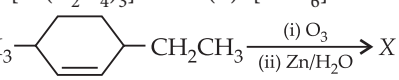
(b) 

(c) 

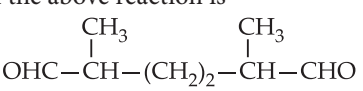
(d) 

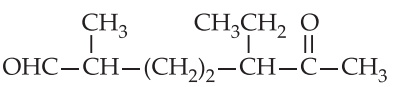
36. In the complexes $[Fe(H_2O)_6]^{3+}$, $[Fe(CN)_6]^{3-}$, $[Fe(C_2O_4)_3]^{3-}$ and $[FeCl_6]^{3-}$, more stability is shown by

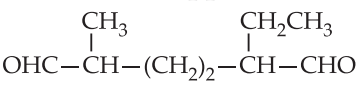
(a) $[Fe(H_2O)_6]^{3+}$ (b) $[Fe(CN)_6]^{3-}$
(c) $[Fe(C_2O_4)_3]^{3-}$ (d) $[FeCl_6]^{3-}$

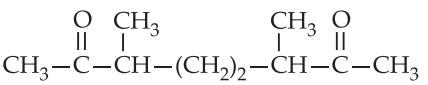
37. 

X in the above reaction is

(a) 

(b) 

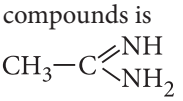
(c) 

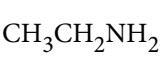
(d) 

38. The atomic weights of two elements *A* and *B* are 40 and 80 respectively. If *x* g of *A* contains *y* atoms, how many atoms are present in 2*x* g of *B*?

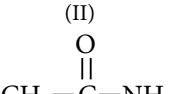
(a) $\frac{y}{2}$ (b) $\frac{y}{4}$ (c) y (d) $2y$

39. The correct order of basicities of the following compounds is


(I)


(II)

(III)


(IV)

(a) II > I > III > IV (b) I > III > II > IV
(c) III > I > II > IV (d) I > II > III > IV

40. A dihaloalkane '*X*' having formula $C_3H_6Cl_2$, on hydrolysis gives a compound, that can reduce Tollens' reagent. The compound '*X*' is

(a) 1, 2-dichloropropane
(b) 1, 1-dichloropropane
(c) 1, 3-dichloropropane
(d) 2, 2-dichloropropane.

41. Match the list I with list II and select the correct answer using the code given below the lists.

	List I		**List II**
P.	sp^2	1.	ICl_4^-
Q.	dsp^2	2.	$Fe(CO)_5$
R.	sp^3d	3.	$SnCl_2$
S.	sp^3d^2	4.	$[Ni(CN)_4]^{2-}$

(a) P - 1, Q - 2, R - 3, S - 4
(b) P - 3, Q - 2, R - 1, S - 4
(c) P - 3, Q - 4, R - 2, S - 1
(d) P - 4, Q - 3, R - 1, S - 2

42. At constant temperature, the equilibrium constant (K_p) for the decomposition reaction,

$$N_2O_4 \rightleftharpoons 2NO_2$$

is expressed by $K_p = 4x^2P/(1 - x^2)$, where P = pressure and x = extent of decomposition. Which of the following statements is true?

(a) K_p increases with increase in P.
(b) K_p increases with increase in x.
(c) K_p increases with decrease in x.
(d) K_p remains constant with change in P and x.

43. In a mixture of PbS, ZnS and FeS, each component is separated from other by using the reagents in the following sequence in froth floatation process

(a) potassium ethyl xanthate, KCN
(b) potassium ethyl xanthate, KCN, NaOH, $CuSO_4$, acid
(c) KCN, $CuSO_4$, acid
(d) none of the above.

44. On passing *I* ampere of current for time *t* sec through 1 litre of 2 M $CuSO_4$ solution (atomic weight of Cu = 63.5), the amount *m* of Cu (in g) deposited on cathode will be

(a) $m = \frac{It}{(63.5 \times 96500)}$

(b) $m = \frac{It}{(31.25 \times 96500)}$

(c) $m = \dfrac{I \times 96500}{(31.25 \times t)}$

(d) $m = \dfrac{31.75 \times I \times t}{96500}$

45. Amongst the acids,
(i) CH≡CCOOH
(ii) CH_2=CHCOOH and
(iii) CH_3CH_2COOH,
the acid strength follows the sequence
(a) (i) < (ii) > (iii) (b) (i) > (ii) > (iii)
(c) (i) = (ii) = (iii) (d) (i) = (ii) > (iii)

NUMERICAL VALUE TYPE

46. *AB* crystallises in a rock salt structure with *A* : *B* = 1 : 1. The shortest distance between *A* and *B* is $Y^{1/3}$ nm. The formula mass of *AB* is 6.023 *Y* a.m.u. where *Y* is an arbitrary constant. The density (in kg m^{-3}) is _____ .

47. Molarity of commercial 11.2 volume H_2O_2 solution is _____ .

48. van't Hoff factor of an electrolyte X_3Y_2 assuming that it ionizes 25% in the solution is _____ .

49. In 1 L saturated solution of AgCl [K_{sp}(AgCl) = 1.6×10^{-10}], 0.1 mol of CuCl [K_{sp}(CuCl) = 1.0×10^{-6}] is added. The resultant concentration of Ag^+ in the solution is 1.6×10^{-x}. The value of *x* is _____ .

50. P_4O_{10} has short and long P—O bonds. The number of short P—O bonds in this compound is _____ .

MATHEMATICS

51. Let *R* = {(3, 3), (6, 6), (9, 9), (12, 12), (6, 12), (3, 9), (3, 12), (3, 6)} be a relation on the set *A* = {3, 6, 9, 12}. The relation is
(a) reflexive and transitive only
(b) reflexive only
(c) an equivalence relation
(d) reflexive and symmetric only

52. Let $a_1, a_2, a_3, \ldots$ be in A.P. and a_p, a_q, a_r be in G.P. Then $a_q : a_p$ is equal to
(a) $\dfrac{r-p}{q-p}$ (b) $\dfrac{q-p}{r-q}$
(c) $\dfrac{r-q}{q-p}$ (d) 1

53. For the function $f(x) = \dfrac{4}{3}x^3 - 8x^2 + 16x + 5$, $x = 2$ is a point of
(a) local maxima (b) local minima
(c) point of inflection (d) none of these

54. If $(\tan x - \tan y)^2$, $(\tan y - \tan z)^2$ and $(\tan z - \tan x)^2$ are in A.P, then $(\tan x - \tan y)$, $(\tan y - \tan z)$ and $(\tan z - \tan x)$ are in
(a) A.P. (b) G.P.
(c) H.P. (d) none of these

55. The area bounded by the lines $x = 1$ and $\sqrt{\dfrac{x}{y}} + \sqrt{\dfrac{y}{x}} = 4$ is
(a) $4\sqrt{3}$ (b) $2\sqrt{3}$ (c) $8\sqrt{3}$ (d) 4

56. $\lim\limits_{x \to 0} \left(\dfrac{1+5x^2}{1+3x^2} \right)^{1/x^2} =$
(a) e^2 (b) e^3 (c) e^5 (d) e

57. If $-1 + \sqrt{-3} = re^{i\theta}$, then θ is equal to
(a) $\dfrac{\pi}{3}$ (b) $-\dfrac{\pi}{3}$ (c) $\dfrac{2\pi}{3}$ (d) $-\dfrac{2\pi}{3}$

58. If *x* is a positive integer, then
$\Delta = \begin{vmatrix} x! & (x+1)! & (x+2)! \\ (x+1)! & (x+2)! & (x+3)! \\ (x+2)! & (x+3)! & (x+4)! \end{vmatrix}$ is equal to
(a) $2(x!)(x+1)!$ (b) $2(x!)(x+1)!(x+2)!$
(c) $2(x!)(x+3)!$ (d) None of these

59. If
$f(x) = \begin{vmatrix} \sin x + \sin 2x + \sin 3x & \sin 2x & \sin 3x \\ 3 + 4\sin x & 3 & 4\sin x \\ 1 + \sin x & \sin x & 1 \end{vmatrix}$,
then the value of $\int_0^{\pi/2} f(x)\,dx$ is
(a) 3 (b) 2/3 (c) 1/3 (d) 0

60. $f(x) = \begin{cases} \alpha + \dfrac{\sin[x]}{x} & , \quad x > 0 \\ 2 & , \quad x = 0 \\ \beta + 6\left[\dfrac{\sin x - x}{x^3}\right] & , \quad x < 0 \end{cases}$
Where [·] is G.I.F. If $f(x)$ is continuous at $x = 0$ then $\beta - \alpha$ equal to
(a) 1 (b) –1 (c) 2 (d) –2

61. Let r be the range of n ($\forall\ n \geq 1$) observations $x_1, x_2, ..., x_n$, if $S = \sqrt{\dfrac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}}$ then

(a) $S < r\sqrt{\dfrac{n^2+1}{n-1}}$ (b) $S \geq r\sqrt{\dfrac{n}{n-1}}$

(c) $S = r\sqrt{\dfrac{n}{n-1}}$ (d) $S < r\sqrt{\dfrac{n}{n-1}}$

62. The angle between the lines $2x = 3y = -z$ and $6x = -y = -4z$ is

(a) $\dfrac{\pi}{6}$ (b) 0 (c) $\dfrac{\pi}{3}$ (d) $\dfrac{\pi}{2}$

63. If $n \in N$, then $11^{n+2} + 12^{2n+1}$ is divisible by

(a) 113 (b) 123

(c) 133 (d) none of these

64. If $\tan^2\alpha \tan^2\beta + \tan^2\beta \tan^2\gamma + \tan^2\gamma \tan^2\alpha + 2\tan^2\alpha \tan^2\beta \tan^2\gamma = 1$ then the value of $\sin^2\alpha + \sin^2\beta + \sin^2\gamma$ is

(a) 0 (b) – 1

(c) 1 (d) None of these

65. The solution of the differential equation $\tan y \dfrac{dy}{dx} = \sin(x+y) + \sin(x-y)$ is

(a) $\sec y - 2\cos x = c$ (b) $\sec y + 2\cos x = c$

(c) $\cos y - 2\sin x = c$ (d) $\sec y + 2\sin x = c$

66. The shortest distance between the parabola's $y^2 = 4x$ and $y^2 - 2x + 6 = 0$ is

(a) $\sqrt{2}$ (b) $\sqrt{5}$

(c) $\sqrt{3}$ (d) none of these.

67. Let α, α^2 be the roots of $x^2 + x + 1 = 0$, then the equation whose roots are α^{31}, α^{62} is

(a) $x^2 - x + 1 = 0$ (b) $x^2 + x - 1 = 0$

(c) $x^2 + x + 1 = 0$ (d) none of these

68. Three numbers are chosen at random without replacement from 1, 2, 3, …, 10. The probability that the minimum of the chosen numbers is 4 or their maximum is 8 is

(a) $\dfrac{11}{40}$ (b) $\dfrac{3}{10}$

(c) $\dfrac{1}{40}$ (d) none of these.

69. The coefficient of x^5 in the expansion of $(x^2 - x - 2)^5$ is

(a) –83 (b) –82 (c) –81 (d) 0

70. The value of $\int e^x(x^5 + 5x^4 + 1)\cdot dx$ is

(a) $e^x \cdot x^5$ (b) $e^x \cdot x^5 + e^x + C$

(c) $e^{x+1} \cdot x^5 + C$ (d) $5x^4 \cdot e^x$

NUMERICAL VALUE TYPE

71. The number of seven digit integers, with sum of the digits equal to 10 and formed by using the digits 1, 2 and 3 only, is_____.

72. If $\vec{a}, \vec{b}, \vec{c}$ are unit vectors, then $|\vec{a} - \vec{b}|^2 + |\vec{b} - \vec{c}|^2 + |\vec{c} - \vec{a}|^2$ does not exceed _____.

73. If the sum of the series 2 + 5 + 8 + 11 + ... is 60100, then the number of terms are_____.

74. The distance of the origin from the plane through the points (1, 1, 0), (1, 2, 1) and (–2, 2, –1) is_____.

75. Let $A = \begin{bmatrix} 0 & 2y & z \\ x & y & -z \\ x & -y & z \end{bmatrix}$ such that $A^TA = I$. Find the value of $x^2 + y^2 + z^2$.

Practice Test-8

- Use Blue/Black ball point pen only for marking responses.
- Mark only one choice for each question as indicated.

Correct marking ● ⓑ ⓒ ⓓ

Wrong marking ⊗ ✓ ◐ ●

1.	ⓐ	ⓑ	ⓒ	ⓓ	26.	ⓐ	ⓑ	ⓒ	ⓓ	51.	ⓐ	ⓑ	ⓒ	ⓓ
2.	ⓐ	ⓑ	ⓒ	ⓓ	27.	ⓐ	ⓑ	ⓒ	ⓓ	52.	ⓐ	ⓑ	ⓒ	ⓓ
3.	ⓐ	ⓑ	ⓒ	ⓓ	28.	ⓐ	ⓑ	ⓒ	ⓓ	53.	ⓐ	ⓑ	ⓒ	ⓓ
4.	ⓐ	ⓑ	ⓒ	ⓓ	29.	ⓐ	ⓑ	ⓒ	ⓓ	54.	ⓐ	ⓑ	ⓒ	ⓓ
5.	ⓐ	ⓑ	ⓒ	ⓓ	30.	ⓐ	ⓑ	ⓒ	ⓓ	55.	ⓐ	ⓑ	ⓒ	ⓓ
6.	ⓐ	ⓑ	ⓒ	ⓓ	31.	ⓐ	ⓑ	ⓒ	ⓓ	56.	ⓐ	ⓑ	ⓒ	ⓓ
7.	ⓐ	ⓑ	ⓒ	ⓓ	32.	ⓐ	ⓑ	ⓒ	ⓓ	57.	ⓐ	ⓑ	ⓒ	ⓓ
8.	ⓐ	ⓑ	ⓒ	ⓓ	33.	ⓐ	ⓑ	ⓒ	ⓓ	58.	ⓐ	ⓑ	ⓒ	ⓓ
9.	ⓐ	ⓑ	ⓒ	ⓓ	34.	ⓐ	ⓑ	ⓒ	ⓓ	59.	ⓐ	ⓑ	ⓒ	ⓓ
10.	ⓐ	ⓑ	ⓒ	ⓓ	35.	ⓐ	ⓑ	ⓒ	ⓓ	60.	ⓐ	ⓑ	ⓒ	ⓓ
11.	ⓐ	ⓑ	ⓒ	ⓓ	36.	ⓐ	ⓑ	ⓒ	ⓓ	61.	ⓐ	ⓑ	ⓒ	ⓓ
12.	ⓐ	ⓑ	ⓒ	ⓓ	37.	ⓐ	ⓑ	ⓒ	ⓓ	62.	ⓐ	ⓑ	ⓒ	ⓓ
13.	ⓐ	ⓑ	ⓒ	ⓓ	38.	ⓐ	ⓑ	ⓒ	ⓓ	63.	ⓐ	ⓑ	ⓒ	ⓓ
14.	ⓐ	ⓑ	ⓒ	ⓓ	39.	ⓐ	ⓑ	ⓒ	ⓓ	64.	ⓐ	ⓑ	ⓒ	ⓓ
15.	ⓐ	ⓑ	ⓒ	ⓓ	40.	ⓐ	ⓑ	ⓒ	ⓓ	65.	ⓐ	ⓑ	ⓒ	ⓓ
16.	ⓐ	ⓑ	ⓒ	ⓓ	41.	ⓐ	ⓑ	ⓒ	ⓓ	66.	ⓐ	ⓑ	ⓒ	ⓓ
17.	ⓐ	ⓑ	ⓒ	ⓓ	42.	ⓐ	ⓑ	ⓒ	ⓓ	67.	ⓐ	ⓑ	ⓒ	ⓓ
18.	ⓐ	ⓑ	ⓒ	ⓓ	43.	ⓐ	ⓑ	ⓒ	ⓓ	68.	ⓐ	ⓑ	ⓒ	ⓓ
19.	ⓐ	ⓑ	ⓒ	ⓓ	44.	ⓐ	ⓑ	ⓒ	ⓓ	69.	ⓐ	ⓑ	ⓒ	ⓓ
20.	ⓐ	ⓑ	ⓒ	ⓓ	45.	ⓐ	ⓑ	ⓒ	ⓓ	70.	ⓐ	ⓑ	ⓒ	ⓓ
21.					46.					71.				
22.					47.					72.				
23.					48.					73.				
24.					49.					74.				
25.					50.					75.				