KINETICS

KINETICS का साथ है तो सफ़लता का विश्वास है।

IIT JEE

PST- 24 SET-A

KINETICS
We Nurture The Future
IIT-JEE | Medical | Foundations

Batch: UDAN
Date: 21/10/2024
Marks: 300
TOPIC:
PHYSICS: OPTICS (WAVE, RAY), MAGENTIC EFFECT OF CURRENT
CHEMISTRY: P BLOCK(11th), COORDINATION, PERIODIC PROPERTIES & CHEMICAL BONDING
MATHEMATICS: DEFINITE & INDEFINITE INTEGRATION

PHYSICS

1. A convex lens with lateral magnification 2 is used to image a point at the bottom of a tank. The image of the point is formed 60cm above the lens. Now a liquid is filled into the tank to a height of 24cm. It is found that the distance of the image of the same point is now 120 cm above the lens. Find the refractive index of the liquid.

(a) 1.31 (b) 1.33
(c) 1.36 (d) 1.39

2. Two parallel wires in free space are 10 cm apart and each carries a current of 10 A in the same direction. The force exerted by one wire on the other, per metre length is

(a) $2\times10^{-4}N$, repulsive

(b) $2\times10^{-7}N$, repulsive

(c) $2\times10^{-4}N$, attractive

(d) $2\times10^{-7}N$, attractive.

3. Given below are two statements :
Statement I : When the white light passed through a prism, the red light bends lesser than yellow and violet.
Statement II : The refractive indices are different for different wavelengths in dispersive medium. In the light of the above statements, chose the correct answer from the options given below:
(a) Statement I is false but Statement II is true
(b) Statement I is true but Statement II is false
(c) Both Statement I and Statement II are true
(d) Both Statement I and Statement II are false

4. The magnetic field $d\vec{B}$ due to a small current element $d\vec{l}$ at a distance $\vec{r}$ and element carrying current i is

(a) $d\vec{B}=\frac{\mu_0}{4\pi}i^2\left(\frac{d\vec{l}\times\vec{r}}{r}\right)$

(b) $d\vec{B}=\frac{\mu_0}{4\pi}i\left(\frac{d\vec{l}\times\vec{r}}{r^3}\right)$

(c) $d\vec{B}=\frac{\mu_0}{4\pi}i\left(\frac{d\vec{l}\times\vec{r}}{r}\right)$

(d) $d\vec{B}=\frac{\mu_0}{4\pi}i^2\left(\frac{d\vec{l}\times\vec{r}}{r^2}\right)$

5. The resistance of an ammeter is 13 Ω and its scale is graduated for a current upto 100 amps. After an additional shunt has been connected to this ammeter it becomes possible to measure currents upto 750 amperes by this meter. The value of shunt - resistance is

(a) 2 Ω (b) 0.2 Ω
(c) 2 $k\Omega$ (d)20 Ω.

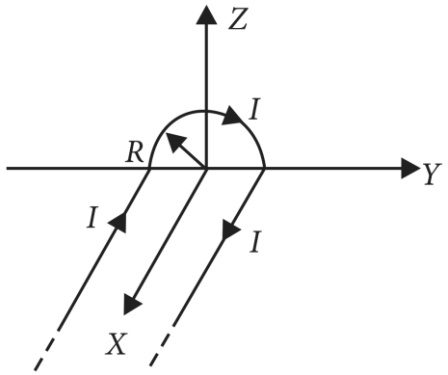
6. In a moving coil galvanometer, the deflection of the coil θ is related to the electrical current i by the relation

(a) $i\propto\tan\theta$ (b) $i\propto\theta$
(c) $i\propto\theta^2$ (d) $i\propto\sqrt{\theta}$

7. The focal length of biconvex lens made of glass, of equal radii is f. If the lens is dipped in the water, then the focal length becomes (Take, refractive index of glass and water as $\frac{3}{2}$ and $\frac{4}{3}$, respectively)

(a) $2f$ (b) $4f$
(c) $(5/3)f$ (d) (7/4)f

8. A wire carrying current I has the shape as shown in adjoining figure. Linear parts of the wire are very long and parallel to X - axis while semicircular portion of radius R is lying in Y - Z plane. Magnetic field at point O is



(a) $\vec{B} = -\frac{\mu_0}{4\pi}\frac{I}{R}\left(\pi\hat{i} + 2\hat{k}\right)$ (b) $\vec{B} = \frac{\mu_0}{4\pi}\frac{I}{R}\left(\pi\hat{i} - 2\hat{k}\right)$

(c) $\vec{B} = \frac{\mu_0}{4\pi}\frac{I}{R}\left(\pi\hat{i} + 2\hat{k}\right)$ (d) $\vec{B} = -\frac{\mu_0}{4\pi}\frac{I}{R}\left(\pi\hat{i} - 2\hat{k}\right)$.

9. A charged particle is moving in a uniform magnetic field in a circular path. Radius of circular path is R. When energy of particle is doubled, then new radius will be

(a) $R\sqrt{2}$ (b) $R\sqrt{3}$

(c) $2R$ (d) $3R$

10. The charge on a particle Y is double the charge on particle X. These two particles X and Y after being accelerated through the same potential difference enter a region of uniform magnetic field and describe circular paths of radii R_1 and R_2 respectively. The ratio of the mass of X to that of Y is

(a) $\left(\frac{2R_1}{R_2}\right)^2$ (b) $\left(\frac{R_1}{2R_2}\right)^2$

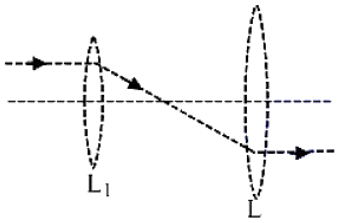
(c) $\frac{R_1^2}{2R_2^2}$ (d) $\frac{2R_1}{R_2}$

11. The angles of incidence and emergence of a light ray passing through a prism of angle A are i and e respectively. The total deviation produced by the prism is

(a) i + e + A (b) $i + e - A$

(c) i + e − 2A (d) $i + e + 2A$

12. The following figure represents two biconvex lenses L_1 and L_2 having focal length 10 cm and 15 cm respectively. The distance between L_1&L_2 is :



(a) 10 cm (b) 35 cm

(c) 25 cm (d) 15 cm

13. A convex lens focusses an object 20cm from it on a screen placed 5cm away from it. A glass plate (refractive index $= \frac{7}{5}$) of thickness 1.4cm is inserted between the lens and the screen. What is the distance of the object from the lens, so that its image is again focused on the screen?

(a) 22.5cm (b) 30.7cm

(c) 25.0cm (d) 28.4cm

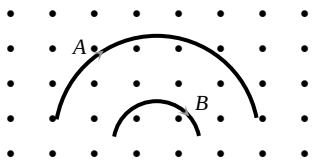
14. Two particles A and B of masses m_A and m_B respectively and having the same charge are moving in a plane. A uniform magnetic field exists perpendicular to this plane. The speeds of the particles are v_A and v_B respectively, and the trajectories are as shown in the figure. Then

(a) $m_A v_A < m_B v_B$

(b) $m_A v_A > m_B v_B$

(c) $m_A < m_B$ and $v_A < v_B$

(d) $m_A = m_B$ and $v_A = v_B$



15. An object is placed infront of a spherical concave mirror between the focal point and the radius of curvature. Its image is

(a) inverted, real, further than radius of curvature from mirror

(b) inverted, virtual, closer than focal point to mirror

(c) upright, real, further than radius of curvature from mirror

(d) inverted, real, closer than radius of curvature to mirror

16. A galvanometer of resistance, G, is shunted by a resistance S ohm. To keep the main current in the circuit unchanged, the resistance to be put in series with the galvanometer is

(a) $\frac{G}{(S+G)}$ (b) $\frac{S^2}{(S+G)}$

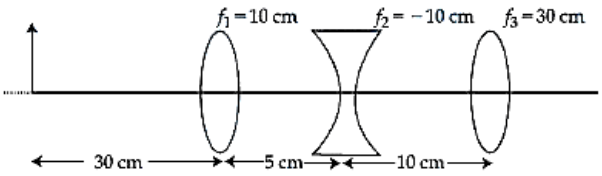
(c) $\frac{SG}{(S+G)}$ (d) $\frac{G^2}{(S+G)}$ (*Mains2011*)

17. If r_1, r_2 are the angle of refraction at first face and second face of a prism, then the angle of the prism is

(a) $r_1 - r_2$ (b) $\frac{(r_1 - r_2)}{2}$

(c) $\frac{(r_1 + r_2)}{2}$ (d) $r_1 + r_2$

18. The position of the image formed by the combination of lenses is :



(a) 15 cm (right of second lens)
(b) 30 cm (left of third lens)
(c) 15 cm (left of second lens)
(d) 30 cm (right of third lens)

19. A deuteron of kinetic energy 50 keV is describing a circular orbit of radius 0.5 metre in a plane perpendicular to magnetic field B. The kinetic energy of the proton that describes a circular orbit of radius 0.5 metre in the same plane with the same B is

(a) 25 keV (b) 50 keV
(c) 200 keV (d) 100 keV

20. The magnifying power of a telescope with tube length 60 cm is 5 . Then the focal length of its eye piece is

(a) 20cm (b) 40cm
(c) 30cm (d) 10cm

21. In an experiment, electrons are accelerated, from rest, by applying a voltage of 500 V. Calculate the radius of the path if a magnetic field 100 mT is then applied.

[Charge of the electron $= 1.6 \times 10^{-19}$C Mass of the electron $= 9.1 \times 10^{-31}$kg]

(a) 7.5×10^{-3} m (b) 7.5×10^{-2} m
(c) 7.5 m (d) 7.5×10^{-4} m

22. For the thin convex lens, the radii of curvature are at 15 cm and 30 cm respectively. The focal length the lens is 20 cm. The refractive index of the material is :

(a) 1.2 (b) 1.8
(c) 1.5 (d) 1.4

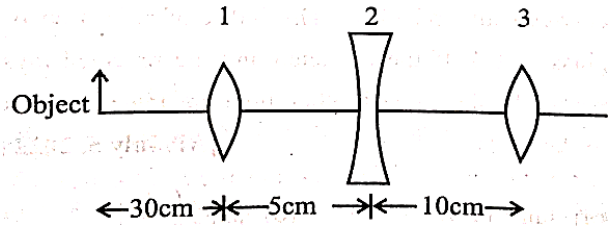
23. What is the refractive index of the material of a double convex lens having radii of curvature of 5cm and 10cm and focal length of $\frac{20}{3}$ cm

(a) 1.5 (b) 2.0
(c) 2.4 (d) 2.6

24. In an ammeter 0.2% ofmain current passes through the galvanometer. If resistance of galvanometer is G, the resistance of ammeter will be

(a) $\frac{1}{499}G$ (b) $\frac{499}{500}G$
(c) $\frac{1}{500}G$ (d) $\frac{500}{499}G$

25. The position of final image formed by the given lens combination from the third lens will be at a distance of ($f_1 = +10$cm, $f_2 = -10$cm, and $f_3 = +30$cm)



(a) 15cm. (b) infinity
(c) 45cm (d) 30cm

MATHEMATICS

26.

$\int e^x \frac{x^2+1}{(x+1)^2} dx$ **is equal to**

(a) $\frac{e^x}{x+1} + C$ (b) $\frac{-e^x}{x+1} + C$
(c) $e^x\left(\frac{x-1}{x+1}\right) + C$ (d) $e^x\left(\frac{x+1}{x-1}\right) + C$

27.

$\int \frac{dx}{(x-1)\sqrt{x^2-1}}$ **is equal to**

(a) $-\sqrt{\frac{x-1}{x+1}} + C$ (b) $\sqrt{\frac{x-1}{x^2+1}} + C$
(c) $-\sqrt{\frac{x+1}{x-1}} + C$ (d) $\sqrt{\frac{x^2+1}{x-1}} + C$

28. $\int_{-\pi/2}^{\pi/2} \frac{\cos x}{1+e^x} dx =$

(a) 1 (b) 0
(c) -1 (d) None of these

29.

$$\int \frac{dx}{\sin(x-a)\cos(x-b)} =$$

(a) $\frac{1}{\sin(a-b)} \log \left|\frac{\sin(x-a)}{\cos(x-b)}\right| + C$
(b) $\frac{1}{\cos(b-a)} \log \left|\frac{\sin(x-a)}{\cos(x-b)}\right| + C$

(c) $\frac{1}{\cos(b-a)}[\log|\sin(x-a)\cos(x-b)|]+C$

(d) $\frac{1}{\sin(a-b)}[\log|\sin(x-a)\cos(x-b)|]+C$

30. If $\int f(x)\cos x\,dx=\frac{1}{2}(f(x))^2+C$ and $f(0)=0$, then $f'(0)=$?

(a) 1 (b) -1

(c) 0 (d) 2

31. The value of $\int_{\frac{\pi}{3}}^{\frac{\pi}{2}}\frac{(2+3\sin x)}{\sin x\,(1+\cos x)}dx$ is equal to

(a) $\frac{7}{2}-\sqrt{3}-\log_3\sqrt{3}$

(b) $-2+3\sqrt{3}+\log_3\sqrt{3}$

(c) $\frac{10}{3}-\sqrt{3}+\log_3\sqrt{3}$

(d) $\frac{10}{3}-\sqrt{3}-\log_3\sqrt{3}$

32.

$$\int \frac{dx}{(x^2+1)(x^2+4)}=$$

(a) $\frac{1}{3}\tan^{-1}x+\frac{1}{6}\tan^{-1}\left(\frac{x}{2}\right)+c$

(b) $\frac{1}{3}\tan^{-1}x-\frac{1}{3}\tan^{-1}\left(\frac{x}{2}\right)+c$

(c) $\frac{1}{3}\tan^{-1}x+\frac{1}{3}\tan^{-1}\left(\frac{x}{2}\right)+c$

(d) $\frac{1}{3}\tan^{-1}x-\frac{1}{6}\tan^{-1}\left(\frac{x}{2}\right)+c$

33. Let $I(x)=\int\frac{6}{\sin^2 x(1-\cot x)^2}dx$. If $I(0)=3$, then $I\left(\frac{\pi}{12}\right)$ is equal to

(a) $2\sqrt{3}$ (b) $\sqrt{3}$

(c) $3\sqrt{3}$ (d) $6\sqrt{3}$

34. The value of

$$\lim_{n\to\infty}\frac{1+2-3+4+5-6+\cdots+(3n-2)+(3n-1)-3n}{2n^4+4n+3-\sqrt{n^4+5n+4}}$$ is

(a) $\frac{\sqrt{2}+1}{2}$ (b) $3(\sqrt{2}+1)$

(c) $\frac{3}{2}(\sqrt{2}+1)$ (d) $\frac{3}{2\sqrt{2}}$

35.

$$\int\frac{x}{(x^2+2x+2)^2}dx \text{ is equal to}$$

(a) $\frac{x^2+2}{x^2+2x+2}-\frac{1}{2}\tan^{-1}(x+1)+C$

(b) $\frac{x^2+2}{2(x^2+2x+2)}-\frac{1}{2}\tan^{-1}(x-1)+C$

(c) $\frac{x^2-2}{4(x^2+2x+2)}-\frac{1}{2}\tan^{-1}(x+1)+C$

(d) $\frac{2(x-1)}{(x^2+2x+2)}+\frac{1}{2}\tan^{-1}(x+1)+C$

36.

$$\int\frac{x^2}{(x^2-1)(x^2+1)}dx=$$

(a) $\frac{1}{4}\log\left|\frac{x+1}{x-1}\right|-\frac{1}{2}\text{Tan}^{-1}x+c$

(b) $\frac{1}{4}\log\left|\frac{x-1}{x+1}\right|+\frac{1}{2}\text{Tan}^{-1}x+c$

(c) $\frac{1}{4}\log\left|\frac{x-1}{x+1}\right|-\frac{1}{2}\text{Tan}^{-1}x+c$

(d) $\frac{1}{4}\log\left|\frac{x+1}{x-1}\right|+\frac{1}{2}\text{Tan}^{-1}x+c$

37.

$$\int e^x\left(\frac{2+\sin 2x}{1+\cos 2x}\right)dx=$$

(a) $e^x\sec x+C$ (b) $e^x\tan x+C$

(c) $e^x\cot x+C$ (d) $e^x\text{cosec}\,x+C$

38. For $x>0$, if $f(x)=\int_1^x\frac{\log_e t}{(1+t)}dt$ then $f(e)+f\left(\frac{1}{e}\right)$ is equal to

(a) $\frac{1}{2}$ (b) -1

(c) 1 (d) 0

39. The value of $\int_0^{2\pi}\cos^{99}x\,dx$ is

(a) 1 (b) -1

(c) 99 (d) 0

40.

$$\int\frac{dx}{x(x^4+1)}=$$

(a) $\frac{1}{4}\log\left(\frac{x^4+1}{x^4}\right)+C$

(b) $\frac{1}{4}\log\left(\frac{x^4}{x^4+1}\right)+C$

(c) $\frac{1}{4}\log(x^4+1)+C$

(d) $\frac{1}{4}\log\left(\frac{x^4}{x^4+2}\right)+C$

41. If $\frac{2x^2+5x+6}{(x+2)^3}=\frac{a}{x+2}+\frac{b}{(x+2)^2}+\frac{c}{(x+2)^3}$ then $a.b+b.c+c.a=$

(a) 28 (b) 14

(c) -10 (d) -8

42. The integral $\int_0^{\pi/4}\frac{136\sin x}{3\sin x+5\cos x}dx$ is equal to :

(a) $3\pi-50\log_e 2+20\log_e 5$

(b) $3\pi-25\log_e 2+10\log_e 5$

(c) $3\pi-10\log_e(2\sqrt{2})+10\log_e 5$

(d) $3\pi-30\log_e 2+20\log_e 5$

43. $\int_{-1}^{1}\log\left(\frac{1+x}{1-x}\right)dx=$

(a) 2 (b) 1

(c) 0 (d) π

44. $\int_0^{\pi}\cos^3 x\,dx=$

(a) -1 (b) 0

(c) 1 (d) π

45. The value of the integral $\int_1^2\left(\frac{t^4+1}{t^6+2}\right)dt$ is

(a) $\tan^{-1}\frac{1}{2}+\frac{1}{3}\tan^{-1}8-\frac{\pi}{3}$

(b) $\tan^{-1}2-\frac{1}{3}\tan^{-1}8+\frac{\pi}{3}$

(c) $\tan^{-1}2+\frac{1}{3}\tan^{-1}8-\frac{\pi}{3}$

(d) $\tan^{-1}\frac{1}{2}-\frac{1}{3}\tan^{-1}8+\frac{\pi}{3}$

46. $\int\frac{x^3}{\sqrt{1+x^2}}dx$ **is equal to**

(a) $\sqrt{1+x^2}-\frac{x}{3}(1+x^2)^{3/2}+C$

(b) $x\sqrt{1+x^2}+\frac{2}{3}(1+x^2)^{3/2}+C$

(c) $x^2\sqrt{1+x^2}-\frac{2}{3}(1+x^2)^{3/2}+C$

(d) $x^2\sqrt{1+x^2}-\frac{1}{3}(1+x^2)^{1/2}+C$

47. The value of $\int_0^{\pi/2}\log\left(\frac{4+3\sin x}{4+3\cos x}\right)dx$ is

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

(c) 0 (d) None of these

48. If $\int\frac{1}{a^2\sin^2 x+b^2\cos^2 x}dx=\frac{1}{12}\tan^{-1}(3\tan x)+$ constant, then the maximum value of $a\sin x+b\cos x$, is :

(a) $\sqrt{40}$ (b) $\sqrt{41}$

(c) $\sqrt{39}$ (d) $\sqrt{42}$

49. If $I=\int_0^{100\pi}\sqrt{(1-\cos 2x)}\,dx$, then the value of I is

(a) $100\sqrt{2}$ (b) $200\sqrt{2}$

(c) $50\sqrt{2}$ (d) None of these

50. So, it is true for very natural no. $'a_1'$

$\lim_{n\to\infty}\frac{3}{n}\left\{4+\left(2+\frac{1}{n}\right)^2+\left(2+\frac{2}{n}\right)^2+\cdots.+\left(3-\frac{1}{n}\right)^2\right\}$ is equal to

(a) 12 (b) $\frac{19}{3}$

(c) 0 (d) 19

CHEMISTRY

51. Anomalous behaviour of oxygen is due to its

(a) Large size and high electronegativity

(b) Small size and low electronegativity
(c) Small size and high electronegativity
(d) Large size and low electronegativity

52. Given below are two statements : one is labelled as Assertion (A) and the other is labelled as

Reason (R). Assertion (A) : The total number of geometrical isomers shown by $[Co(en)_2Cl_2]^+$complex ion is three.

Reason (R): $[Co(en)_2Cl_2]^+$complex ion has an octahedral geometry.
In the light of the above statements, choose the most appropriate answer from the options given below :
(a) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
(b) (A) is not correct but (R) is correct
(c) Both (A) and (R) are correct and (R) is the correct explanation of (A)
(d) (A) is correct but (R) is not correct

53. Match List I with List II

	LIST - I		**LIST - II**
	(Complex ion)		**(Electronic Configuration)**
A.	$[Cr(H_2O)_6]^{3+}$	**I.**	$t_2{}^2e_g^0$
B.	$[Fe(H_2O)_6]^{3+}$	**II.**	$t_2\,g^3eg^0$
C.	$[Ni(H_2O)_6]^{2+}$	**III.**	$t_2\,g^3e^2$
D.	$[V(H_2O)_6]^{3+}$	**IV.**	$t_2\,g^6e^2$

Choose the correct answer from the options given below :
(a) A-III, B-II, C-IV, D-I (b) A-IV, B-I, C-II, D-III
(c) A-IV, B-III, C-I, D-II (d) A-II, B-III, C-IV, D-I

54. The correct sequence of electron gain enthalpy of the elements listed below is
A. Ar
B. Br
C. F
D. S

Choose the most appropriate from the options given below:
(a) C > B > D > A (b) A > D > B > C
(c) A > D > C > B (d) D > C > B > A

55. Aluminium chloride in acidified aqueous solution forms an ion having geometry
(a) Octahedral (b) Square Planar
(c) Tetrahedral (d) Trigonal bipyramidal

56. The molecular formula of felspar is

(a) $K_2O.Al_2O_3.6SiO_2$ (b) $K_2O.3Al_2O_3.6SiO_2$

(c) Na_3AlF_6 (d) $CaSO_4.2H_2O$

57. Given below are two statements; one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A) : PH_3 has lower boiling point than NH_3. Reason (R) : In liquid state NH_3 molecules are associated through vander waal's forces, but PH_3 molecules are associated through hydrogen bonding. In the light of the above statements, choose the most appropriate answer from the options given below:
(a) Both (A) and (R) are correct and (R) is not the correct explanation of (A)
(b) (A) is not correct but (R) is correct
(c) Both (A) and (R) are correct but (R) is the correct explanation of (A)
(d) (A) is correct but (R) is not correct

58. Number of complexes from the following with even number of unpaired " d " electrons is

$[V(H_2O)_6]^{3+}, [Cr(H_2O)_6]^{2+}, [Fe(H_2O)_6]^{3+},$

$[Ni(H_2O)_6]^{3+}, [Cu(H_2O)_6]^{2+}$

[Given atomic numbers : $V = 23, Cr = 24, Fe = 26, Ni = 28 Cu = 29$]
(a) 2 (b) 1
(c) 4 (d) 5

59. Match List-I with List-II

List-I	**List-II**
Molecule	**Shape**
(A) BrF_5	**(I) T-shape**
(B) H_2O	**(II) See saw**
(C) ClF_3	**(III) Bent**
(D) SF_4	**(IV) Square pyramidal**

(a) (A)-I, (B)-II, (C)-IV, (D)-III
(b) (A) -II, (B)-I, (C)-III, (D)-IV
(c) (A)-III, (B)-IV, (C)-I, (D)-II
(d) (A)-IV, (B)-III, (C)-I, (D)-II

60. The coordination geometry around the manganese in decacarbonyldimanganese(0)
(a) Octahedral (b) Trigonal bipyramidal
(c) Square pyramidal (d) Square planar

61. Which of the following material is not a semiconductor.
(a) Silicon (b) Copper oxide
(c) Germanium (d) Graphite

62. The correct increasing order for bond angles among BF_3, PF_3 and ClF_3 is :
(a) $BF_3 < PF_3 < ClF_3$
(b) $ClF_3 < PF_3 < BF_3$
(c) $PF_3 < BF_3 < ClF_3$
(d) $BF_3 = PF_3 < ClF_3$

63. Given below are two statements:
Statement I: Fluorine has most negative electron gain enthalpy in its group.
Statement II: Oxygen has least negative electron gain enthalpy in its group.
In the light of the above statements, choose the most appropriate from the options given below.
(a) Both Statement I and Statement II are true
(b) Statement I is true but Statement II is false
(c) Both Statement I and Statement II are false
(d) Statement I is false but Statement II is true

64. Arrange the bonds in order of increasing ionic character in the molecules. LiF, K_2O, N_2, SO_2 and ClF_3.
(a) $ClF_3 < N_2 < SO_2 < K_2O < LiF$
(b) $LiF < K_2O < ClF_3 < SO_2 < N_2$
(c) $N_2 < SO_2 < ClF_3 < K_2O < LiF$
(d) $N_2 < ClF_3 < SO_2 < K_2O < LiF$

65. Which one of the following molecules has maximum dipole moment?
(a) NF_3 (b) CH_4
(c) PF_5 (d) NH_3

66. Match List I with List II

	List - I (Compound/Species)		**List - II (Shape/Geometry)**
A.	**SF_4**	**I.**	**Tetrahedral**
B.	**BrF_3**	**II.**	**Pyramidal**
C.	**BrO_3^-**	**III.**	**See saw**
D.	**$NH_4^{++}KS$**	**IV.**	**Bent T-Shape**

Choose the correct answer from the options given below:
(a) A-II, B-III, C-I, D-IV (b) A-II, B-IV, C-III, D-I
(c) A-III, B-IV, C-II, D-I (d) A-III, B-II, C-IV, D-I

67. Match List - I with List - II.

List - I Reaction	**List - II Type of redox reaction**
(A) $TiCl_4$	**(I) e^2, t_2^0**
(B) $[FeO_4]^{2-}$	**(II) e^4, t_2^3**
(C) $[FeCl_4]^-$	**(III) e^0, t_2^0**
(D) $[CoCl_4]^{2-}$	**(IV) e^2, t_2^3**

Choose the correct answer from the options given below :

(a) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)
(b) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)
(c) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)
(d) (A)-(I), (B)-(III), (C)-(IV), (D)-(II)

68. The electron affinity value are negative for

A. $Be \rightarrow Be^-$
B. $N \rightarrow N^-$
C. $O \rightarrow O^{2-}$
D. $Na \rightarrow Na^-$
E. $Al \rightarrow Al^-$
Choose the most appropriate answer from the options given below :

(a) D and E only (b) A, B and C only
(c) A and D only (d) A, B, D and E only

69. Which of the following is least ionic?
(a) $BaCl_2$ (b) AgCl
(c) KCl (d) $CoCl_2$

70. Which of the following is not true about potash alum

(a) Its empirical formula is $KAl(SO_4)_2.12H_2O$

(b) Its aqueous solution is basic

(c) It is used in dyeing industries

(d) On heating it melts in its water of crystallization

71. Anhydrous $AlCl_3$ is obtained from

(a) HCl and aluminium metal

(b) Aluminium and chlorine gas

(c) Hydrogen chloride gas and aluminium metal

(d) None of the above

72. Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R.
Assertion A : H_2 Te is more acidic than H_2 S.
Reason R: Bond dissociation enthalpy of H_2Te is lower than H_2 S.
In the light of the above statements. Choose the most appropriate from the options given below.
(a) Both A and R are true but R is NOT the correct explanation of A.
(b) Both A and R are true and R is the correct explanation of A.
(c) A is false but R is true.
(d) A is true but R is false.

73. Nitrogen gas is absorbed by

(a) Calcium hydroxide

(b) Ferrous sulphate

(c) Calcium carbide

(d) Aluminium carbide

74. Given below are two statements:

Statement (I) : The oxidation state of an element in a particular compound is the charge acquired by its atom on the basis of electron gain enthalpy consideration from other atoms in the molecule.

Statement (II) : $p\pi - p\pi$ bond formation is more prevalent in second period elements over other periods.
In the light of the above statements, choose the most appropriate answer from the options given below :
(a) Both Statement I and Statement II are correct
(b) Both Statement I and Statement II are incorrect
(c) Statement I is incorrect but Statement II is correct
(d) Statement I is correct but Statement II is incorrect

75. The linear combination of atomic orbitals to form molecular orbitals takes place only when the combining atomic orbitals

A. have the same energy
B. have the minimum overlap
C. have same symmetry about the molecular axis
D. have different symmetry about the molecular axis

Choose the most appropriate from the options given below:

(a) A, B, C only (b) A and C only
(c) B, C, D only (d) B and D only