

SUBJECT : PHYSICS & CHEMISTRY

Test Booklet
Set No.
05

GUJARAT COMMON ENTRANCE TEST (GUJCET) 2019

Date: 26 April, 2019 | Duration: 2 Hours | Max. Marks: 80

:: IMPORTANT INSTRUCTIONS ::

1. The Physics and Chemistry test consists of 80 questions. Each question carries 1 mark. For each correct response, the candidate will get 1 mark. For each incorrect response $\frac{1}{4}$ mark will be deducted. The maximum marks are 80.
2. This test is of 2 hrs. duration.
3. Use Black Ball Point Pen only for writing particulars on OMR Answer Sheet and marking answer by darkening the circle '•'.
4. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
5. On completion of the test, the candidate must handover the Answer Sheet to the Invigilator in the Room/Hall. The candidates are allowed to take away this Test Booklet with them.
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Candidate's Name :

Exam. Seat No. (in figures).....(in words).....

Name of Exam. Centre :Exam. Centre No. :

Test Booklet Set No. :Test Booklet No. :

Candidate's Sign.....Block Supervisor Sign.....

PART-I : PHYSICS

1. The dimensional formula of $\sqrt{\mu_r \epsilon_r}$ is _____
(A) $M^1L^{-1}T^{-2}A^{-1}$ (B) $M^1L^1T^{-2}A^0$ (C) $M^0L^0T^0A^0$ (D) $M^0L^2T^{-2}A^0$

Ans. (C)

Sol.
$$v = \frac{1}{\sqrt{\mu_0 \epsilon_0 \mu_r \epsilon_r}} = \frac{c}{\sqrt{\mu_r \epsilon_r}}$$
$$\sqrt{\mu_r \epsilon_r} = \frac{c}{v} = \text{Dimensionless.}$$

2. At large distances from source \vec{E} and \vec{B} are in phase and the decrease in their magnitude is comparatively slower with distance r as per _____
(A) r^{-1} (B) r (C) r^{-3} (D) r^2

Ans. (A)

Sol. For at point source

$$I = \frac{P}{4\pi r^2} = \frac{1}{2} \epsilon_0 E^2 C$$
$$\Rightarrow E \propto \frac{1}{r}$$

3. The angular spread of central maximum, in diffraction pattern, does not depend on _____
(A) the distance between the slit and source (B) width of slit
(C) wavelength of light (D) frequency of light

Ans. (A)

Sol. Angular spread of central maxima is $\theta = 2\lambda/a$.

4. The ratio of resolving power of telescope, when lights of wavelength 4400\AA and 5500\AA are used, is _____
(A) 16 : 25 (B) 4 : 5 (C) 9 : 1 (D) 5 : 4

Ans. (D)

Sol. Resolving power $\propto \frac{1}{\lambda}$

$$\frac{\theta_1}{\theta_2} = \frac{\lambda_2}{\lambda_1} = \frac{5500}{4400} = \frac{5}{4}$$

5. In Young's experiment fourth bright fringe produced by light of 5000\AA superposes on the fifth bright fringe of an unknown wavelength. The unknown wavelength is _____ \AA .
(A) 4000 (B) 6000 (C) 5000 (D) 8000

Ans. (A)

Sol. $4\beta_1 = 5\beta_2$

$$4 \times 5000 \frac{D}{d} = 5 \times \lambda \frac{D}{d}$$
$$\lambda = 4000\text{\AA}$$

6. IN X-ray tube the potential difference between the anode and the cathode is 20 kV and the current flowing is 1.6 mA. The number of electrons striking the anode in 1s is _____.

(Charge of an electron = $1.6 \times 10^{-19}\text{C}$)

- (A) 10^{14} (B) 1.25×10^{16} (C) 10^{16} (D) 6.25×10^{18}

Ans. (C)

Sol. $1.6 \times 10^{-3} = \frac{q}{t}$

$\Rightarrow q = 1.6 \times 10^{-3}\text{C}$

$ne = 1.6 \times 10^{-3}$

$n \times 1.6 \times 10^{-19}$

$= 1.6 \times 10^{-3}$

$n = 10^{16}$

7. If the kinetic energy of the electron in the hydrogen atoms is $\frac{e^2}{8\pi\epsilon_0 r}$, then its potential energy is _____.

- (A) $\frac{e^2}{4\pi\epsilon_0 r}$ (B) $-\frac{e^2}{4\pi\epsilon_0 r}$ (C) $\frac{e^2}{8\pi\epsilon_0 r}$ (D) $-\frac{e^2}{8\pi\epsilon_0 r}$

Ans. (B)

Sol. $\frac{|P.E. |}{2} = K.E.$

P.E. = -2K.E.

$= -2 \times \frac{e^2}{8\pi\epsilon_0 r} = -\frac{e^2}{4\pi\epsilon_0 r}$

8. The wavelength of the first line of Lyman series is λ . The wavelength of the first line in Paschen series is _____

- (A) $108/7$ (B) $27/5$ (C) $7/108$ (D) $5/27$

Ans. (A)

Sol. $\frac{1}{\lambda} = R\left(\frac{1}{1^2} - \frac{1}{2^2}\right)$

$\Rightarrow \frac{1}{\lambda_1} = R\left(\frac{1}{3^2} - \frac{1}{4^2}\right)$

$\Rightarrow \frac{\lambda_1}{\lambda} = \frac{\frac{3}{4}}{\frac{16 \times 9}{16 \times 9}}$

$\Rightarrow \lambda_1 = \frac{3}{4} \times \frac{16 \times 9}{7} \lambda$

$\Rightarrow \lambda_1 = \frac{108}{7} \lambda$

9. For a radioactive element, $\tau = \text{_____} \tau_{1/2}$.
 (A) 0.693 (B) 693 (C) 144 (D) 1.44

Ans. (D)

Sol. $T_{\text{mean}} \times \ln 2 = T_{1/2}$
 $T_{\text{mean}} = T_{1/2}(1/\ln 2)$
 $= 1.44 T_{1/2}$

10. For the following nuclear disintegration process ${}^{238}_{92}\text{U} \rightarrow {}^{206}_{82}\text{Pb} + x[{}^4_2\text{He}] + [{}^0_{-2}\text{e}]$ then value of x is _____.
 (A) 8 (B) 6 (C) 4 (D) 10

Ans. (A)

Sol. Mass should be conserved
 $238 = 206 + 4x + 0$
 $x = 32/4 = 8$

11. If the radii of ${}^{64}_{30}\text{Zn}$ and ${}^{27}_{13}\text{Al}$ nuclei are R_1 and R_2 respectively then $\frac{R_1}{R_2} = \text{_____}$.

- (A) $\frac{64}{27}$ (B) $\frac{4}{3}$ (C) $\frac{3}{4}$ (D) $\frac{27}{64}$

Ans. (B)

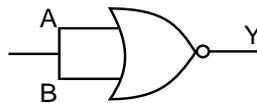
Sol. $R \propto A^{1/3}$
 $\frac{R_1}{R_2} = \left(\frac{64}{27}\right)^{1/3} = \frac{4}{3}$

12. For PN junction, the intensity of electric field is 1×10^6 V/m and the width of depletion region is 5000\AA . The value of potential barrier = _____ V.
 (A) 0.05 (B) 0.005 (C) 0.5 (D) 5

Ans. (C)

Sol. $V = Ed = 10^6 \times 5 \times 10^{-7} = 0.5\text{V}$

13. The logic circuit in the figure represents characteristics of which logic gate ?



- (A) NOR (B) OR (C) NAND (D) NOT

Ans. (D)

Sol.

Input	Output
0	1
1	0

14. For PN junction, the width of space charge region is approximately _____ μm .
 (A) 0.5 (B) 6 (C) 5 (D) 0.05

Ans. (A)

Sol.

15. A modulating signal of frequency 5 kHz and peak voltage of 8V is used to modulate a carrier of frequency 10 MHz and peak voltage 10V. Then the amplitude of USB is _____ V.

- (A) 3 (B) 4 (C) 2 (D) 5

Ans. (B)

Sol. $\frac{\mu A_C}{2} = \frac{A_m}{A_C} \times \frac{A_C}{2} = \frac{A_m}{2} = \frac{8}{2} = 4V$

16. The propagation of radio waves with frequency 2 MHz to 30 MHz is due to _____.

- (A) Space wave (B) Optical fibre (C) Ground wave (D) Sky wave

Ans. (D)

Sol.

17. When two spheres having 4Q and -2Q charge are placed at a certain distance, the force acting between them is F. Now they are connected by a conducting wire and again separated from each other. Now they are kept at a distance half of the previous one. The force acting between them is _____.

- (A) F (B) F/4 (C) F/2 (D) F/8

Ans. (C)

Sol. $F = \frac{K(4Q)(2Q)}{r^2} = \frac{8KQ^2}{r^2}$

$$F' = \frac{K(Q)(Q)}{\left(\frac{r}{2}\right)^2} = \frac{4KQ^2}{r^2}$$

18. Charge of 1 μ C each is placed on the five corners of a regular hexagon of side 1m. The electric field at its centre is _____ N/C

- (A) $\frac{5}{6} \times 10^{-6} K$ (B) $5 \times 10^{-6} K$ (C) $\frac{6}{5} \times 10^{-6} K$ (D) $10^{-6} K$

Ans. (D)

Sol. Electric field at centre due to five charges is equal to E.F due to one charge

$$E = \frac{KQ}{r^2}$$

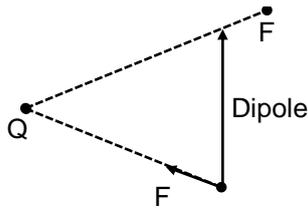
$$= \frac{K \times (10^{-6})}{1^2} = 10^{-6} K$$

19. An electric dipole is placed in a non-uniform electric field, then _____

- (A) The resultant force acting on the dipole is always zero
(B) Torque acting on it may be zero
(C) The resultant force acting on the dipole may be zero
(D) Torque acting on it is always zero.

Ans. (B)

Sol. (i)



$$F_{\text{net}} \neq 0$$

$$\tau_{\text{net}} \neq 0$$

(ii)



$$F_{\text{net}} \neq 0$$

$$\tau_{\text{net}} = 0$$

20. The unit of intensity of polarization is _____.

(A) C/m^2

(B) C^2/m^2

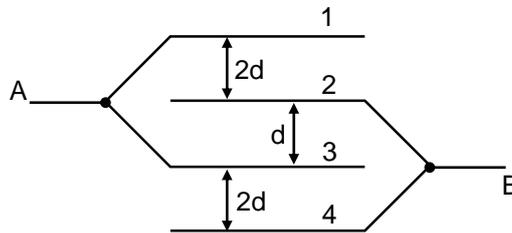
(C) C^2/m

(D) m^2/C

Ans. (A)

Sol.
$$I = \frac{\text{Dipolemoment}}{\text{volume}} = \frac{Cm}{m^3} = \frac{C}{m^2}$$

21. In the figure area of each plate is A and the distance between consecutive plates is as shown in the figure. What is the effective capacitance between points A & B



(A) $\frac{A\epsilon_0}{d}$

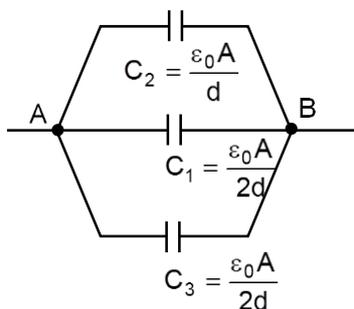
(B) $\frac{3A\epsilon_0}{d}$

(C) $\frac{2A\epsilon_0}{d}$

(D) $\frac{4A\epsilon_0}{d}$

Ans. (C)

Sol.



$$C_{\text{eq}} = \frac{\epsilon_0 A}{d} + \frac{\epsilon_0 A}{2d} + \frac{\epsilon_0 A}{2d} = \frac{2\epsilon_0 A}{d}$$

22. A moving positive charge approaches a negative charge. What will happen to the potential energy of the system ?

- (A) will remain constant (B) will decrease (C) will increase (D) may increase or decrease

Ans. (B)

Sol.
$$U = \frac{K(q_1)(-q_2)}{r}$$

$r \downarrow \Rightarrow U \downarrow$

23. The heat produced per unit time, on passing electric current through a conductor at a given temperature, is directly proportional to the _____.

- (A) Electric current (B) Reciprocal of electric current
(C) Square of electric current (D) Reciprocal of square of electric current

Ans. (C)

Sol. $P = I^2R$

24. A carbon resistor has three bands as brown, black and green in order. What will be the range of resistance it offers.

- (A) $7 \times 10^5 \Omega - 13 \times 10^5 \Omega$ (B) $9 \times 10^5 \Omega - 11 \times 10^5 \Omega$
(C) $8 \times 10^5 \Omega - 12 \times 10^5 \Omega$ (D) None of these

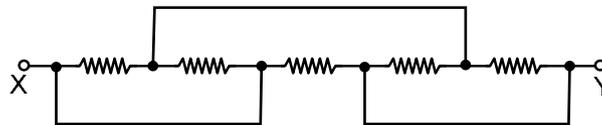
Ans. (C)

Sol. $R = (10 \times 10^5) \pm 20\%$

$R_{\min} = 8 \times 10^5 \Omega$

$R_{\max} = 12 \times 10^5 \Omega$

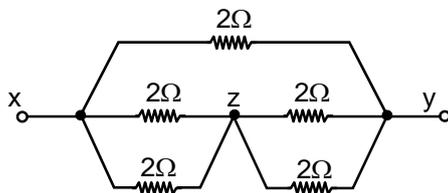
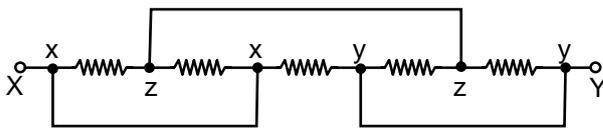
25. In the network shown in the figure the equivalent resistance between points X & Y will be _____ Ω . Value of each resistance is 2Ω .



- (A) 2 (B) 4 (C) 1 (D) 2/3

Ans. (C)

Sol.



$R_{xy} = 1\Omega$

26. Shunt wire should be _____.
 (A) Thick and long (B) Thick and short (C) Thin and long (D) Thin and short

Ans. (B)

Sol. Shunt should have low resistance

$$R = \frac{\rho \ell}{A}$$

ℓ should be less

A should be large

27. The dimensional formula of effective torsional constant of spring is _____.

(A) $M^1L^2T^{-3}$ (B) $M^1L^2T^{-2}A^{-2}$ (C) $M^1L^2T^{-2}$ (D) $M^0L^0T^0$

Ans. (C)

Sol. $\tau = C\theta$

$$C = \tau/\theta$$

$$C \equiv [ML^2T^{-2}]$$

28. There are 50 turns per cm length in a very long solenoid. It carries a current of 2.5A. The magnetic field at its centre on the axis is _____T.

(A) $5\pi \times 10^{-3}$ (B) $6\pi \times 10^{-3}$ (C) $2\pi \times 10^{-3}$ (D) $4\pi \times 10^{-3}$

Ans. (A)

$$\text{Sol. } B = \mu_0 ni = 4\pi \times 10^{-7} \times \frac{50}{10^{-2}} \times 2.5$$

$$= 5\pi \times 10^{-3}$$

29. The gyromagnetic ratio of an electron = _____ specific charge of an electron.

(A) 1 (B) 2 (C) 1/2 (D) 4

Ans. (C)

Sol. Ratio = $q/2m = 1/2 \times$ specific charge

30. Alnico is an alloy of _____

(A) Al, Ni, Cu, P (B) Al, Ni, Cu, Co (C) Al, Ni, As, P (D) Al, As, P, Pt

Ans. (B)

31. The focal length of a thin lens made from the material of refractive index 1.5 is 15 cm. When it is placed in a liquid of refractive index 4/3, its focal length will be _____ cm.

(A) 80.31 (B) 50 (C) 78.23 (D) 60

Ans. (D)

$$\text{Sol. } \frac{1}{15} = (1.5 - 1) \left(\frac{1}{R_1} - \frac{1}{R_2} \right)$$

$$\frac{1}{f} = \left(\frac{1.5}{4/3} - 1 \right) \left(\frac{1}{R_1} - \frac{1}{R_2} \right)$$

$$\frac{f}{15} = \frac{1/2}{(1/8)}$$

$$f = 4 \times 15 = 60 \text{ cm}$$

32. Time taken by the sunlight to pass through a slab of 4 cm and refractive index 1.5 is _____ sec.

- (A) 2×10^{-8} (B) 2×10^{-11} (C) 2×10^{-10} (D) 2×10^{11}

Ans. (C)

Sol. $t = \frac{d}{v} = \frac{dn}{c} = \frac{4 \times 10^{-2}}{3 \times 10^8} \times \frac{3}{2}$

$t = 2 \times 10^{-10}$ sec.

33. If the tube length of astronomical telescope is 96 cm and magnifying power is 15 for normal setting, then the focal length of the objective is _____ cm.

- (A) 100 (B) 90 (C) 105 (D) 92

Ans. (B)

Sol. $|m| = \frac{f_0}{f_e} = 15$

$f_0 = 15 f_e$ tube length = $f_0 + f_e = 96$

$15f_e + f_e = 96$

$f_e = 6$ cm

$f_0 = 15 \times 6 = 90$ cm

34. Photons of energy 2eV and 2.5eV successively illuminate a metal whose work function is 0.5 eV. The

ratio of maximum speed of emitted electron is _____.

- (A) $\sqrt{3} : 2$ (B) 2 : 1 (C) 1 : 2 (D) $2 : \sqrt{3}$

Ans. (A)

Sol. $K.E_{\max} = h\nu - \phi$

$\frac{1}{2}mv^2 = h\nu - \phi$

$\frac{v_1^2}{v_2^2} = \frac{2 - 0.5}{2.5 - 0.5} = \frac{1.5}{2} = \frac{3}{4}$

$\frac{v_1}{v_2} = \frac{\sqrt{3}}{2}$

35. To increase de-Broglie wavelength of an electron from 0.5×10^{-10} m to 10^{-10} m, its energy should be _____.

- (A) increased to 4 times (B) halved (C) doubled (D) decreased to fourth part

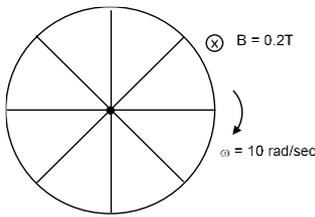
Ans. (D)

Sol. $\lambda = \frac{h}{p} = \frac{h}{\sqrt{2mK}}$

$\lambda \rightarrow 2\lambda. \quad \Rightarrow \quad K \rightarrow \frac{K}{4}$

36. A wheel of radius 2m having 8 conducting concentric spokes is rotating about its geometrical axis with an angular velocity of 10 rad/s in a uniform magnetic field of 0.2T perpendicular to its plane. The value of induced emf between the rim of the wheel and centre is _____V
 (A) 2 (B) 6 (C) 4 (D) 8

Ans. (C)
 Sol.



$$\varepsilon = \frac{1}{2} B\omega R^2$$

$$\varepsilon = \frac{1}{2} \times 0.2 \times (10)(2)^2 = 0.1 \times 4 \times 10 = 4V$$

37. A coil of surface area 200 cm² having 25 turns is held perpendicular to the magnetic field of intensity 0.02 Wb/m². The resistance of the coil is 1Ω. If it is removed from the magnetic field in 1s, the induced charge in the coil is _____ C.
 (A) 1 (B) 0.01 (C) 0.1 (D) 0.001

Ans. (B)

Sol. $q = \frac{\phi_i - \phi_f}{R} = \frac{NBA}{R} = \frac{25 \times 0.02 \times 200 \times 10^{-4}}{1}$
 $= 25 \times 2 \times 2 \times 10^{-4}$
 $= 10^{-2}C = 0.01C$

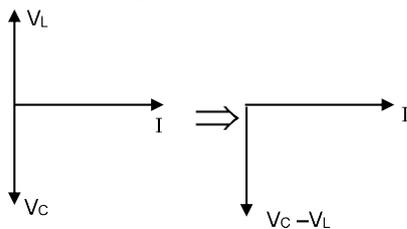
38. The dimensional formula of JWL is _____. Take Q as the dimension of charge.
 (A) M⁻¹L²T⁻¹Q⁻² (B) M⁻¹L⁻²T⁻¹Q⁻² (C) M¹L²T⁻¹Q⁻² (D) M¹L²T¹Q⁻²

Ans. ()

39. If in an A.C., L-C series circuit X_C > X_L. Hence potential _____.
 (A) lags behind the current by π/2 (B) leads the current by π in phase
 (C) leads the current by π/2 in phase (D) lags behind the current by π in phase.

Ans. (A)

Sol. Phasor diagram



Potential lags by π/2 phase

40. In L-C-R, A.C. series circuit, L = 9 H, R = 10Ω & C = 100μF. Hence Q-factor of the circuit is _____.
 (A) 25 (B) 45 (C) 35 (D) 30

Ans. (D)

Sol. $Q = \frac{1}{R} \sqrt{\frac{L}{C}} = \frac{\omega_0 L}{R}$

$$Q = \frac{1}{10} \sqrt{\frac{9}{100 \times 10^{-6}}} = \frac{3}{10 \times 10^{-2}} = 30$$

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Paper 1 : Physics and Chemistry

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CHEMISTRY

41. Element A and B do not form an alloy because
(A) Both elements have similar crystal structures
(B) Radius of A is 115 pm while radius of B is 187 pm
(C) Both are the members of same group
(D) Both have similar electronic configuration in valence shell

Ans. (B)

Sol. For alloy formation radius of components should be almost same.

42. What is the correct order for energy of d orbitals during splitting in Tetra Chlorido Nickelate(II) complex ion?

- (A) $d_{xy} \cong d_{yz} \cong d_{xz} < d_{x^2-y^2} \cong d_{z^2}$ (B) $d_{xy} \cong d_{yz} \cong d_{xz} \cong d_{x^2-y^2} \cong d_{z^2}$
(C) $d_{xy} \cong d_{yz} \cong d_{xz} > d_{x^2-y^2} \cong d_{z^2}$ (D) $d_{x^2-y^2} > d_{z^2} > d_{xy} \cong d_{yz} \cong d_{xz}$

Ans. (C)

Sol. Ligands are coming off axis.

43. Which of the following complex ion is the most stable?

- (A) $[\text{Co}(\text{NH}_3)_6]^{3+}$ (B) $[\text{CoCl}_6]^{3-}$ (C) $[\text{CoF}_6]^{3-}$ (D) $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$

Ans. (A)

Sol. NH_3 is strongest ligand amongs the following Co^{+3} complexes.

44. The primary valency and secondary valency of central metal ion and the no. of total ions produced in aqueous solution for $\text{K}[\text{Co}(\text{OX})_2(\text{NH}_3)_2]$ complex respectively is _____.

- (A) 3, 4, 2 (B) 4, 4, 2 (C) 3, 6, 2 (D) 3, 6, 1

Ans. (C)

Sol. $(1) + (x) + 2(-2) + 2(0) = 0$

Or $x = 3$

45. Which of the following complexes possess meridional isomer?

- (A) $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$ (B) $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]$ (C) $[\text{Co}(\text{NH}_3)_2\text{Cl}_4]$ (D) $[\text{Co}(\text{NH}_3)_5\text{Cl}]$

Ans. (A)

Sol. $[\text{Ma}_3\text{b}_3]$ exhibits fac & mer isomerism.

46. Which of the following compound undergoes aldol condensation?

- (A) Formaldehyde (B) Trichloro acetaldehyde
(C) Trimethyl acetaldehyde (D) Acetaldehyde

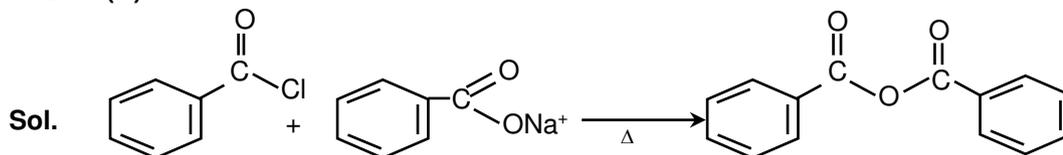
Ans. (D)

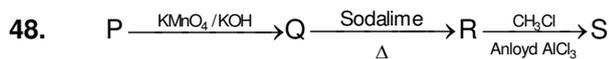
Sol. Only aldehyde and ketones with $\text{B}\alpha\text{H}$ as $\text{CH}_3-\text{C} \begin{array}{l} \text{O} \\ \parallel \\ \text{H} \end{array}$ (acetaldehyde) undergoes Aldol condensation.

47. Benzoyl chloride + Sodium benzoate $\xrightarrow{\Delta}$ _____.

- (A) Benzaldehyde (B) Benzyl alcohol
(C) Benzyl benzoate (D) Benzoic anhydride

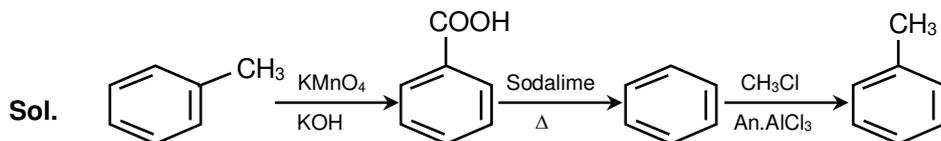
Ans. (D)





If P and S are toluene, Q & R are _____ and _____ respectively.
 (A) Benzaldehyde, Benzoic acid (B) Benzaldehyde, Sodium benzoate
 (C) Benzoic acid, Benzene (D) Benzene, Benzoic acid

Ans. (C)

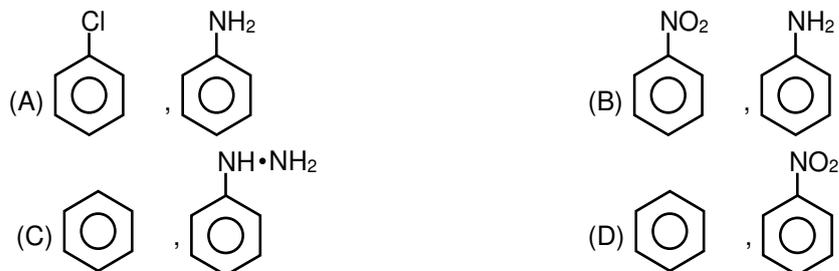
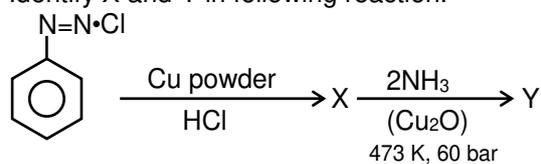


49. Type of Hybridisation of N and C–N–C bond angle in $(\text{CH}_3)_3\text{N}$ are _____ and _____ respectively.
 (A) sp^3 , 108° (B) sp^2 , 120° (C) sp^3 , $109^\circ 28'$ (D) sp^2 , 117.5°

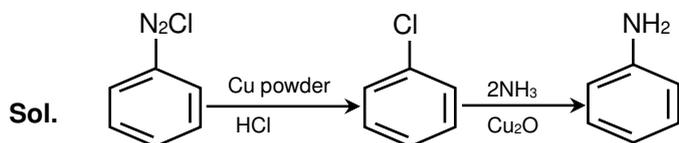
Ans. (A)

Sol. Steric number = $4(sp^3)$ & $3BP + 1LP$

50. Identify X and Y in following reaction.



Ans. (A)

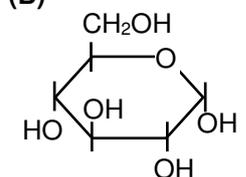


51. Why glucose is called gluco-pyranose?

- (A) glucose is aldohexose.
 (B) glucose is a cyclic compound containing five carbon atoms and one oxygen atom.
 (C) glucose is ketohexose.
 (D) glucose is a cyclic compound containing six carbon atoms.

Ans. (B)

Sol.



α -D-glucopyranose

52. Which protein present in muscle is insoluble in water?
 (A) Carotene (B) Insulin (C) Albumin (D) Myosin

Ans. (D)

Sol. Myosin is found in muscle.

53. Giving 'T' symbol for true statement and 'F' symbol for false statement, select suitable option from the given options for following statements.

i) Cytosine base is the derivative of pyrimidine.

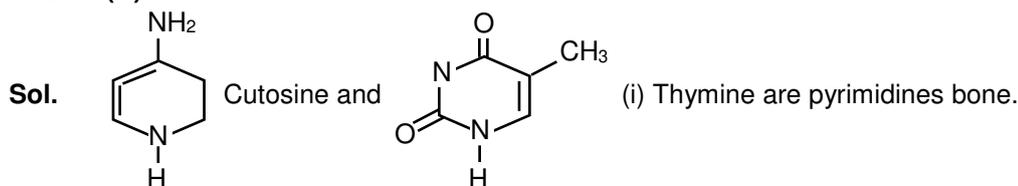
ii) β -D Ribose sugar is present in DNA.

iii) The message for the synthesis of a specific protein is present in RNA.

iv) DNA is responsible for maintaining the identify of different species of organisms for one century

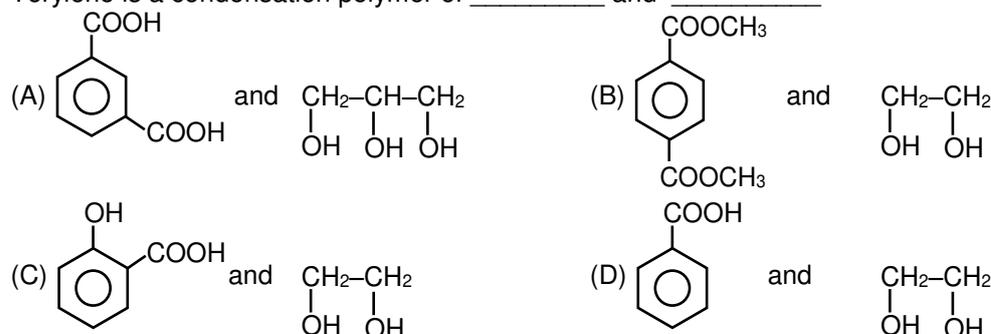
(A) TFFT (B) FFFT (C) FTFF (D) FFTF

Ans. (A)



(i) Thymine are pyrimidines base.

54. Terylene is a condensation polymer of _____ and _____



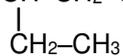
Ans. (A)

Sol. None is correct

Terylene is a condensation polymers of and Ethylene glycol.

55. Which of the following acid has property of flexibility?

(A) $\text{HO}-\text{CH}-\text{CH}_2-\text{COOH}$ (B) $\text{HOOC}-(\text{CH}_2)_4-\text{COOH}$



(C) $\text{HO}-\text{CH}-\text{CH}_2-\text{COOH}$ (D) $\text{HOOC}-(\text{CH}_2)_2-\text{COOH}$



Ans. (C)

Sol. Polymers derived from 3-hydroxy butyric acid has the property of flexibility.

56. What is cellulose diacetate?

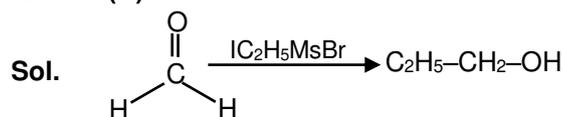
(A) Semisynthetic polymer (B) Plasticizer
 (C) Natural polymer (D) Synthetic polymer

Ans. (A)

Sol. Cellulose of semisynthetic polymers

57. What is the packing efficiency of arrangement in a body centred unit cell.
 (A) 53.26% (B) 74.00% (C) 68.00% (D) 64.00%
- Ans. (C)**
Sol. Packing fraction = 0.68
58. Which one of the following compounds show both Schottky and Frenkel defects?
 (A) AgCl (B) AgBr (C) AgI (D) KCl
- Ans. (B)**
Sol. Theory based.
59. Calculate Van't Hoff factor (i) for an aqueous solution of $K_3[Fe(CN)_6]$ having a degree of dissociation (α) equal to 0.778.
 (A) 4.334 (B) 3.334 (C) 0.222 (D) 2.334
- Ans. (B)**
Sol. $i_{diss} = 1 + (n - 1)\alpha$
 $= 1 + (4 - 1)\alpha$
 $= 3.334$
60. If molality of a solution is 0.05 and elevation in boiling point is 0.16 K then, what is the molal elevation constant of the solvent?
 (A) 3.2 (B) 1.6 (C) 2.2 (D) 2.3
- Ans. (A)**
Sol. $\Delta T_b = K_b m$
 or $0.16 = K_b \times 0.05$
61. The value of which of the following unit of concentration will not change with the change in temperature?
 (A) Molarity (B) Molality (C) Normality (D) Formality
- Ans. (B)**
Sol. It is mass- mass unit
62. $Zn_{(s)} / Zn^{2+}_{(aq)}(1M) // Ni^{2+}_{(aq)}(1M) / Ni_{(s)}$
 Which is incorrect for the above given cell?
 (A) Electrochemical cell (B) Voltaic cell (C) Galvanic cell (D) Daniel cell
- Ans. (D)**
Sol. Cell reaction in Daniel cell is :
 $Zn(s) + Cu^{+2}(aq) \longrightarrow Zn^{+2}(aq) + Cu(s)$
63. If one mole electrons is passed through the solutions of $AlCl_3$, $AgNO_3$ and $MgSO_4$, in what ratio Al, Ag and Mg will be deposited at the electrodes?
 (A) 3 : 6 : 2 (B) 2 : 6 : 3 (C) 1 : 2 : 3 (D) 3 : 2 : 1
- Ans. (B)**
Sol. $eq_{Al} = eq_{Ag} = eq_{Mg}$
 $eq = \text{moles} \times n\text{-factor}$
 $Al^{+3} + 3e^- \longrightarrow Al$
 $Ag^+ + e^- \longrightarrow Ag$
 $Mg^{+2} + 2e^- \longrightarrow Mg$
 $\frac{1}{3} \text{ mol Al} : 1 \text{ mol Ag} : \frac{1}{2} \text{ mol Mg}$
 or 2 : 6 : 3
64. At which temperature, ceramic materials behave as super conductors?
 (A) 0 K (B) 15 K (C) 200 K (D) 150 K
- Ans. (D)**
Sol. Theory based

65. Which of the following mineral of Iron is in the form of carbonate?
 (A) Haematite (B) Siderite (C) Magnetite (D) Iron Pyrites
Ans. (B)
Sol. Siderite : FeCO_3
66. Which of the following hydride is the most stable?
 (A) PH_3 (B) SbH_3 (C) NH_3 (D) AsH_3
Ans. (C)
Sol. Less size difference.
67. In which of the following pair of oxyacid of phosphorous, oxidation states of P are not the same?
 (A) H_3PO_4 and $\text{H}_4\text{P}_2\text{O}_7$ (B) H_3PO_4 and $\text{H}_5\text{P}_3\text{O}_{10}$
 (C) $\text{H}_4\text{P}_2\text{O}_7$ and $\text{H}_5\text{P}_3\text{O}_{10}$ (D) $\text{H}_4\text{P}_2\text{O}_7$ and H_3PO_3
Ans. (D)
Sol. $\text{H}_4\text{P}_2\text{O}_7$ and H_3PO_3
68. Which of the following order of acidic strength is correct?
 (A) $\text{HClO} > \text{HClO}_2 > \text{HClO}_3 > \text{HClO}_4$ (B) $\text{HClO}_4 > \text{HClO}_2 > \text{HClO}_3 > \text{HClO}$
 (C) $\text{HClO}_2 > \text{HClO} > \text{HClO}_4 > \text{HClO}_3$ (D) $\text{HClO}_4 > \text{HClO}_3 > \text{HClO}_2 > \text{HClO}$
Ans. (D)
Sol. $\text{HClO}_4 > \text{HClO}_3 > \text{HClO}_2 > \text{HClO}$
69. 1,2-dichloro ethane is which type of halide?
 (A) Geminal halide (B) Vicinal halide (C) Alkylidene halide (D) Allylic halide
Ans. (B)
Sol. Dihalides with halogen atoms on adjaxement as 1, 2-dichlose ethane is alsocalled vicinal haldies.
70. Polarimeter is used to determine _____ of compounds.
 (A) D and L configuration (B) d and l configuration
 (C) R and S configuration (D) Both D and L as well as d & l configuration
Ans. (B)
71. Which of the following group of compounds are extinguisher, antiseptic, insecticide and anesthetic respectively?
 (A) CHCl_3 , CHI_3 , DDT, CCl_4 (B) DDT, CHCl_3 , CCl_4 , CHI_3 ,
 (C) CCl_4 , CHI_3 , DDT, CHCl_3 (D) CCl_4 , CHI_3 , CHCl_3 , DDT
Ans. (C)
Sol. CCl_4 is used as firer extinguisher, CHI_3 , as antiseptic, DDT used as insection and CHCl_3 (Chloroform) also as aneethetic.
72. Which of the following alcohol has the highest boiling point?
 (A) Butan-2-ol (B) 2-Methylpropan-2-ol
 (C) Propan-2-ol (D) Butan-1-ol
Ans. (B)
Sol. Creakr the molecules mass, higher the boiling point, further greather the branching, lesser the boiling. Point.
73. Which is the major product obtained by hydrolysis of compound formed by reaction between formaldehyde and ethyl magnesium bromide?
 (A) Ethan-1-ol (B) Propan-2-ol (C) Propan-1-ol (D) 2-Methyl-propan-2-ol
Ans. (C)



74. Give the IUPAC name for methyl salicylate.

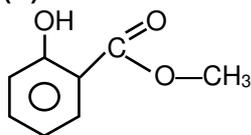
(A) Methoxy benzoic acid

(B) 2'-Hydroxy benzoic acid

(C) Methyl-2'-hydroxy benzoate

(D) Methyl-3-hydroxy benzoate

Ans. (C)



Sol.

Methyl-2'-Hydroxy benzoate.

75. Instantaneous rate of reaction for the reaction $3A + 2B \longrightarrow 5C$ is _____.

(A) $+\frac{1}{3} \frac{d[A]}{dt} = -\frac{1}{2} \frac{d[B]}{dt} = +\frac{1}{5} \frac{d[C]}{dt}$

(B) $-\frac{1}{3} \frac{d[A]}{dt} = -\frac{1}{2} \frac{d[B]}{dt} = +\frac{1}{5} \frac{d[C]}{dt}$

(C) $-\frac{1}{3} \frac{d[A]}{dt} = +\frac{1}{2} \frac{d[B]}{dt} = -\frac{1}{5} \frac{d[C]}{dt}$

(D) $+\frac{1}{3} \frac{d[A]}{dt} = -\frac{1}{2} \frac{d[B]}{dt} = -\frac{1}{5} \frac{d[C]}{dt}$

Ans. (B)

Sol. $r = \pm \frac{1}{sc} \frac{dc}{dt}$

76. In a reaction $A \longrightarrow B$, if the concentration of reactant is increased by 9 times then rate of reaction increases 3 times. What is the order of reaction?

(A) 2

(B) 3

(C) $\frac{1}{2}$

(D) $\frac{1}{3}$

Ans. (C)

Sol. $r = k[A]^n$

or $r' = 3r = k[9A]^{1/2}$

77. Which statement is incorrect for collision theory?

(A) The collision between the reacting molecules is essential

(B) The collision of the reactant molecules should be from any direction

(C) There must be certain minimum energy for the reactant experiencing collision

(D) The reactant experiencing fruitful collisions are converted to products

Ans. (B)

Sol. Theory based

78. The formation of association of colloidal particles by addition of electrolyte to form an insoluble precipitate is called _____.

(A) Flocculation

(B) Emulsification

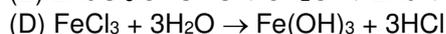
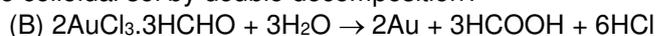
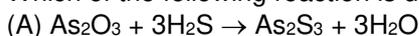
(C) Coagulation

(D) Micelle

Ans. (C)

Sol. Theory based

79. Which of the following reaction is used to prepare colloidal sol by double decomposition?



Ans. (A)

Sol. Theory based.

80. Which of the following pair has similar magnetic moment?

(A) Cr^{3+} , Mn^{3+}

(B) Fe^{3+} , Mn^{2+}

(C) Fe^{2+} , Mn^{2+}

(D) Ni^{2+} , Co^{2+}

Ans. (B)

Sol. 5 unpaired electrons in both.