

Time Allowed: 25 Minutes

(OBJECTIVE PART)

Note: Four answers are given against each column A, B, C & D, Select the write answer and only separate answer sheet, fill the circle A, B, C or D with pen or marker in front of that question number.

Max Marks: 17

- Q.1 Circle the correct option i.e. A / B / C / D. Each part carries one mark.
- (i) The relative permittivity for rubber is:
 (A) 2.284 (B) 3.40 (C) 2.94 (D) 2.1
- (ii) Electric potential energy per unit charge is:
 (A) electric field (B) electric intensity (C) electric flux (D) electric potential
- (iii) In an electrolyte the charge carriers are:
 (A) Positive and negative ions (B) protons (C) positive ions and electrons (D) electrons
- (iv) The unit of conductivity is:
 (A) slemen (B) mho (C) mho m^{-1} (D) Ohm m^{-1}
- (v) A galvanometer can be made more sensitive if C/BAN is made:
 (A) zero (B) small (C) large (D) infinite
- (vi) In CRO the number of electrons are controlled by:
 (A) filament (B) cathode (C) grid (D) anode
- (vii) Lenz's law deals with the:
 (A) Magnitude of emf (B) direction of emf (C) magnitude of current (D) direction of induced current
- (viii) The self-induced emf is sometimes called:
 (A) motional emf (B) variable emf (C) back emf (D) constant emf
- (ix) Peak of peak value of voltage is:
 (A) $\sqrt{2}V_0$ (B) $2V_0$ (C) $\frac{V_0}{\sqrt{2}}$ (D) $\frac{V_0}{2}$
- (x) The frequencies of AM transmission range between:
 (A) 450 KHz to 1400 KHz (B) 500 KHz to 1500 KHz (C) 450 KHz to 1600 KHz (D) 88 KHz to 108 KHz
- (xi) A substance which undergoes plastic deformation is called:
 (A) Ductile (B) Plastic (C) Brittle (D) Ceramic
- (xii) The curie temperature for iron is about:
 (A) 400°C (B) 570°C (C) 750°C (D) 1000°C
- (xiii) The current gain of a transistor is given as:
 (A) $\frac{I_E}{I_C}$ (B) $\frac{I_C}{I_E}$ (C) $\frac{I_B}{I_E}$ (D) $\frac{I_C}{I_B}$
- (xiv) The quantity $\sqrt{1 - \frac{v^2}{c^2}}$ is always:
 (A) zero (B) equal to one (C) less than one (D) greater than one
- (xv) The dimensions of factor $\frac{h}{m_0c}$ is same as that of:
 (A) length (B) time (C) mass (D) momentum
- (xvi) The value of Rydberg constant is:
 (A) 10.0974 m^{-1} (B) $1.0974 \times 10^7 \text{ m}^{-1}$ (C) $1.0974 \times 10^{-7} \text{ m}^{-1}$ (D) $2.01974 \times 10^{-7} \text{ m}^{-1}$

(xvii) Radioactivity was discovered by:

(A) Maxwell

(B) Max Plank

(C) Henri Becquerel

(D) Einstein

(SUBJECTIVE PART)

Time Allowed: 2:35 Hours

Total Marks Section B, C and D: 60

Note: The Questions of sections B, C and D are to be answered on the separately provided answer book. Use supplementary answer sheet i.e., Sheet-B if required. Write your answers neatly and legibly.

SECTION - B

(MARKS 21)

(Chapters 12 to 16)

2.2 Answer any SEVEN parts. All parts carry equal marks.

(7 × 3 = 21)

- i) In the expression $F = K \frac{q_1 q_2}{r^2}$, briefly discuss K and the factors on which it depends.
- ii) What are electric lines of force? Why two electric lines of force never cross each other?
- iii) What is source of current? Discuss briefly.
- iv) Do bends in a wire affect electrical resistance? Discuss.
- v) Define one Tesla and show that $\text{Wbm}^{-2} = 1 \text{ Tesla}$.
- vi) Why do the picture on TV screen become distorted when a magnet is brought near the screen?
- vii) Does the induced emf always act to decrease the magnetic flux through a circuit? Discuss briefly.
- viii) Show that ϵ and $\frac{\Delta \phi}{\Delta t}$ have the same unit.
- ix) A sinusoidal current have rms value of 10A. What is the peak value?
- x) How does the doubling of frequency affect the reactance of a) an inductor b) a capacitor?

SECTION - C

(MARKS 21)

(Chapters 17 to 21)

3 Answer any SEVEN parts. All parts carry equal marks.

(7 × 3 = 21)

- i) Distinguish between Crystalline, Amorphous and polymeric solids.
- ii) What is meant by strain energy? How can it be determined from the force extension graph?
- iii) What is principle of virtual ground? Apply it to find the gain of an inverting amplifier.
- iv) Why a photodiode is operated in reverse biased state? Discuss briefly.
- v) Is it possible to create a single electron from energy? Discuss briefly.
- vi) What advantages does an electron microscope has over an optical microscope?
- vii) Prove that electron can exist in the atom but outside the nucleus.
- viii) Define population inversion. Why population inversion is necessary for laser action?
- ix) Why are heavy nuclei unstable? Discuss briefly.
- x) What is fusion reaction? What factors make this reaction difficult to achieve?

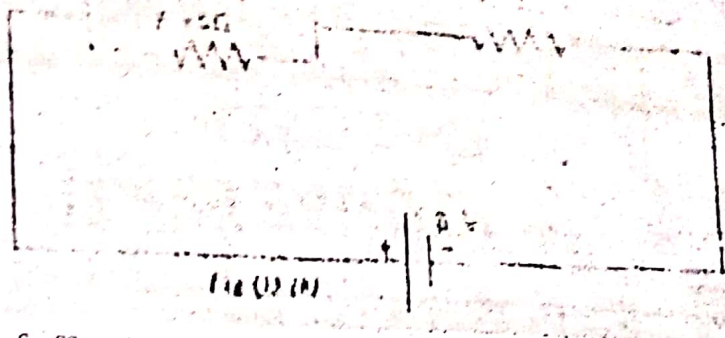
SECTION - D

(MARKS 26)

4 Attempt any TWO questions. All questions carry equal marks.

(13 × 2 = 26)

- a. What is R.C series circuit? Discuss its behaviour with AC. Calculate the impedance and phase angle of R.C series circuit.
- b. How fast must a proton move in a magnetic field of $2.50 \times 10^{-3} \text{ T}$ such that magnetic force is equal to its weight?
- c. What are super conductors? Discuss briefly.
- a. State and prove Gauss's law. Derive an expression for electric intensity due to an infinite sheet of charge.
- b. Find the equivalent resistance and total current drawn from the source. Also find current through each resistance for the circuit.



- c. Briefly discuss back emf effect in motor.
- a. What is photoelectric effect? Discuss its results and explain this effect on the basis of quantum theory.
- b. Calculate the longest wavelength of radiation for Paschen series.
- c. What is background radiation / State its sources.

Geniusnesthub.com

OVERSEAS FEDERAL BOARD 2019 HSSC – II

CHEMISTRY (OBJECTIVE PART)

Time Allowed: 25 Minutes

Max Marks: 17

Note: Four answers are given against each column A, B, C & D, Select the write answer and only separate answer sheet, the circle A, B, C or D with pen or marker in front of that question number.

- Q.1** Circle the correct option i.e. A / B / C / D. Each part carries one mark.
- (i) The SI unit of equivalent does is:
 (A) Curie (B) Gray (C) Rad (D) Sievert
- (ii) The relativity permittivity for Benzene is:
 (A) 2.284 (B) 2.1 (C) 2.94 (D) 7.5
- (iii) One Joule is equal to:
 (A) 6.25×10^{-18} eV (B) 1.6×10^{-19} eV (C) 1.6×10^{19} eV (D) 6.25×10^{18} eV
- (iv) Kirchoff's point rule is a manifestation of law of conservation of:
 (A) momentum (B) mass (C) charge (D) energy
- (v) The drift velocity of electrons in a metallic conductor is of the order of:
 (A) 10^{-5} ms⁻¹ (B) 10^{-2} ms⁻¹ (C) 10^{-4} ms⁻¹ (D) 10^{-3} ms⁻¹
- (vi) The unit of magnetic flux is:
 (A) Nm⁻¹ A (B) NmA⁻¹ (C) Nm² A⁻¹ (D) Nm⁻¹ A⁻¹
- (vii) The magnetic induction is also called:
 (A) magnetization (B) magnetic flux (C) magnetic intensity (D) flux density
- (viii) An induced emf in a coil is produced due to:
 (A) change of momentum (B) change of electric flux (C) magnetic intensity (D) change of energy
- (ix) The self-inductance of a coil is expressed as:
 (A) $\frac{-\Delta t}{\Delta I}$ (B) $\frac{-\epsilon_L}{\Delta I}$ (C) $\frac{-\epsilon_L}{\Delta t}$ (D) $\frac{-\Delta I}{\epsilon_L}$
- (x) The most common source of alternating voltage is:
 (A) DC motor (B) DC generator (C) AC generator (D) Transformer
- (xi) The range of F.M transmission frequencies is:
 (A) 88KHz to 108 MHz (B) 540KHz to 1600 MHz (C) 500KHz to 1600 MHz (D) 88KHz to 108 MHz
- (xii) The conductivity of a semiconductor in (Ωm)⁻¹ is:
 (A) 10^{-6} to 10^{-4} (B) 10^2 to 10^7 (C) 10^4 to 10^7 (D) 10^{-20} to 10^{-10}
- (xiii) The ratio of stress to strain is called:
 (A) Young's Modulus (B) Modulus of Elasticity (C) Moduls of Rigidity (D) Shear Modulus
- (xiv) A device which can convert various physical quantities into electric voltage is called:
 (A) Sensor (B) Transistor (C) Amplifier (D) Rectifier
- (xv) The Earth's orbital speed is:
 (A) 0.3 kms⁻¹ (B) 3000 kms⁻¹ (C) 300 kms⁻¹ (D) 30 kms⁻¹
- (xvi) de.Broglie's relation is given as:
 (A) $\lambda = \frac{mv}{h}$ (B) $h = mv\lambda$ (C) $v = \frac{h}{m\lambda}$ (D) $\lambda = \frac{h}{mv}$
- (xvii) A transmitter consists of:
 (A) One electrode (B) Two electrodes (C) Three electrodes (D) Four electrodes

(SUBJECTIVE PART)

Time Allowed: 2:35 Hours

Total Marks Section B, C and D: 63

Note: The Questions of sections B, C and D are to be answered on the separately provided answer book Use supplementary answer sheet i.e., Sheet-B if required. Write your answers neatly and legibly.

SECTION - B**(MARKS 21)****(Chapters 12 to 16)**

Q.2 Answer any SEVEN parts. All parts carry equal marks.

(7 × 3 = 21)

- (i) By using $\lambda = \frac{1}{4\pi\epsilon}$, show that $\epsilon = 8.85 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
- (ii) How can you identify that which plate of a capacitor is positively charged? Discuss briefly.
- (iii) Name the charge carriers in metals electrolytes and gases.
- (iv) Why does the terminal potential difference of a battery decreases when the current drawn from it is increased? Explain briefly.
- (v) What is sensitive galvanometer? How can a galvanometer be made more sensitive? Discuss briefly.
- (vi) How can you use a magnetic field to separate isotopes of chemical element?
- (vii) Define efficiency of a transformer. How can one improve the efficiency of a transformer? Discuss briefly.
- (viii) Can a DC motor be turned into a DC generator? If yes, what changes are required to be done?
- (ix) What is phase of A.C? Discuss briefly.
- (x) At what frequency will an inductor of 1H have reactance of 500 Ω ?

SECTION - C**(MARKS 21)****(Chapters 17 to 21)**

Q.3 Answer any SEVEN parts. All parts carry equal marks.

(7 × 3 = 21)

- (i) Define 'Proportional limit 'UTS' and 'Plasticity'.
- (ii) For Hysteresis loop define the terms saturation relativity and coercivity.
- (iii) Briefly discuss the characteristics of op-amp.
- (iv) Why is the base current in a transistor very small? Discuss briefly.
- (v) When a solid is heated why does it first appeared? Discuss briefly.
- (vi) A particle of mass 5.0mg moves with speed of 8.0 ms^{-1} . Calculate its de-Broglie wavelength.
- (vii) Is energy conserved when an atom emits a photon of light? Discuss briefly.
- (viii) What are the advantages of laser over ordinary light?
- (ix) A particle which produces more ionization is less penetrating. Why?
- (x) Give a brief account of interaction of radiations with matter.

SECTION - D**(MARKS 26)**

Note: Attempt any TWO questions. All questions carry equal marks.

(13 × 2 = 26)

- Q.4
 - a. State Kirchhoff's rules. Explain Kirchhoff's second rule in detail.
 - b. Find the radius of an orbit of an electron moving at the rate of $2.0 \times 10^7 \text{ ms}^{-1}$ in a uniform magnetic field of $1.20 \times 10^{-3} \text{ T}$.
 - c. In an R-L circuit will the current lag or lead? Discuss by a vector diagram.
- Q.5
 - a. What do you mean by electromagnetic induction? Describe any three methods of producing induced emf.
 - b. Determine the electric field at the position $r = (4 \hat{i} + 3 \hat{j}) \text{ m}$ caused by a point charge $q = 5.0 \times 10^{-5} \text{ C}$ placed at origin.
- Q.6
 - a. The inputs of a gate are 1 and 0. Identify the gate if its output is a) 0, b) 1
 - b. State postulates of Bohr's theory of hydrogen atom. Derive an expression for a radius of quantized orbit.
 - c. What is the maximum wavelength of two photons produced when a positron annihilates an electron? The rest mass energy of each is 0.5 MeV.
 - d. Define mass defect and binding energy.