Test: First Half book Physics (Chapters 12 to 16) Class: Second Year Total Marks=50

Name of the Student: _____

Q. No. 1. Select the correct option and encircle it. (20)

(i) For the computation of flux, the surface area should be
(a) flat (b) curve (c) inclined (d) spherical

(ii) The electron & proton of a H-atom are separated by a distance of 5.3×10^{-11}m. The magnitude of electric force is
(a) 5.2×10^{-8} N (b) 6.2×10^{-8} N (c) 7.2×10^{-8} N (d) 8.2×10^{-8} N

(iii) Electron Volt (eV) is the unit of
(a) Potential Difference (b) Current (c) Capacitance (d) Energy

(iv) Potentiometer can be used as
(a) Ammeter (b) CRO (c) Galvanometer (d) Potential divider

(v) The cost to burn a 100W light bulb for 24 hours, if electric energy costs Rs10/- per kWh, is
(a) Rs 24/- (b) Rs 34/- (c) Rs 44/- (d) Rs 54/-

(vi) A charged particle moves freely in a circular path in the presence of a constant magnetic field applied perpendicular to the particle's velocity, its kinetic energy
(a) remains constant (b) increases (c) decreases (d) becomes zero

(vii) The S.I. unit of inductance, the Henry, can be written as
(a) weber/amp (b) joule/amp^2 (c) volt-sec/amp (d) All of these

(viii) The primary winding of a transformer has 500 turns & secondary has 5000 turns. The primary is connected to an a.c supply of 20V, 50Hz; the secondary will have an out put of
(a) 200V, 50Hz (b) 200V, 500Hz (c) 2V, 50Hz (d) 2V, 5Hz

(ix) The North Pole end of a bar magnet is held near a stationary positively charged piece of plastic. Is the plastic?
(a) attracted (b) repelled (c) unaffected by the magnet (d) none of these

(x) At high frequency the reactance of the capacitor will be
(a) high (b) low (c) remain same (d) becomes zero

(xi) The power factor "$\cos\theta$ "for resistor in A.C circuits is always
(a) greater than one (b) less than one (c) equal to one (d) equal to zero

(xii) The process of combining low frequency signal with high frequency radio wave is called
(a) Amplification (b) Modulation (c) Demodulation (d) Resonance

(xiii) The principle of an electric generator is
(a) Coulomb's law (b) Ampere's law (c) Faraday's law (d) Lenz's law

(xiv) If the velocity of a conductor moving through a magnetic field B is zero, then its motional emf will be
(a) –vBL (b) –v/ BL (c) –BL / v (d) Zero

(xv) Which of the following converts electrical energy into mechanical energy?
(a) Transformer (b) Motor (c) D.C generator (d) A.C generator

(xvi) To convert a galvanometer of resistance 50Ω and current limit 2 mA into an ammeter of range 1A, the resistance required is
(a) 25Ω (b) 0.1Ω (c) 0.2Ω (d) 0.05Ω

(xvii) The S.I unit of magnetic induction is
(a) Weber (b) Tesla (c) Weber/ meter (d) Gauss

(xviii) At resonance frequency the power factor of RLC series circuit is
a. zero b. one c. two d. three

(xix) At resonance frequency the circuit impedance in RLC parallel circuit is
a. maximum b. minimum c. zero d. none of these

(xx) The currents induced in the core of transformer perpendicular to the change of magnetic flux are called
a. electronic current b. conventional current c. hysteresis d. eddy current

Question No. 2 Write Short Answers of any six of the following: 2x6=12

i. Define capacitance and unit of capacitance.
ii. Do bends in a wire affect its electrical resistance? Explain.
iii. Why the resistance of an ammeter should be very low?
iv. What is a transformer? Differentiate between its two types.
v. In a R-L circuit, will the current lag or lead the voltage? Illustrate your answer by a vector diagram.
vi. Four unmarked wires emerge from a transformer. What steps would you take to determine the turns ration?
vii. Why does resistance of a conductor rise with temperature?
viii. Why does the picture on a TV screen become distorted when a magnet is brought near the screen?

Q. No. 3 (a). Explain the experimental procedure to determine the charge to mass ratio (e/m) of an electron. **(5)**

(b). An ideal step down transformer is connected to main supply of 240 V. It is desired to operate a 12 V, 30 W lamp. Find the current in the primary and the transformation ratio. **(3)** **OR**

Q.No.4 (a). Derive an expression for the force on a charged particle moving in a magnetic field. What is the direction of the force? **(5)**

(b). The magnetic field at a certain region is given by **B** = (40i-18k) Wb m^{-2}. How much flux passes through a 5.0 cm^2 area loops in this region if the area lies flat in the XY-plane. **(3)**

Q.No. 5 (a) **Write short answers of following questions.** **(2x3=6)**

i. What do you mean by a balance bridge in Wheatstone bridge?
ii. Why deflection becomes half when a suitable resistance is taken from shunt in an exp. to find resistance of galvanometer.
iii. What is potentiometer? Give its two uses.

(b). Write brief procedure to find the resistance of voltmeter by drawing graph b/w **R** and **1/V**. **(3)** **OR**
Write brief procedure to find the internal resistance of a cell using potentiometer.