

TIME: 3 HOURS

SUBJECT:- PHYSICS-B

Note: Write same question number and its part number on answer book as given in question paper.

SECTION - A (16) Marks

Attempt all parts in this section

Physics

Q.1(a). Choose the correct answer.

- (i) The SI unit of Planck's constant is a: J/s b: J/s^2 c: $J - s$ d: $J - s^2$
- (ii) Positron are created in process of a: Fission b: Fusion c: Laser d: Pair production
- (iii) In L orbit the maximum number of electrons are a: 2 b: 4 c: 6 d: 8
- (iv) For Stepup transformer a: $N_s > N_p$ b: $N_p > N_s$ c: $V_p > V_s$ d: $V_s > V_p$
- (v) The SI unit of electric flux is a: Nm^2/c b: N/mc c: Nm^2/c d: N/m^2c
- (vi) The motion of charges causes a: Force b: Current c: Power d: Work
- (vii) Number of neutron in an atom is a: Z-A b: A-Z c: Z+A d: Z+A
- (viii) The common emitter β is a: IC/IE b: IC/IB c: IE/IB d: IB/IE
- (ix) The SI unit of stress is the same as that of a: Momentum b: Pressure c: Force d: length
- (x) Fill in the blanks with suitable words given in bracket.
 - i) The NAND gate performs inverse of -----.
 - ii) The energy of three electron volt is -----.
 - iii) The relation of uncertainty principle is -----.
 - iv) According to theory of relativity all motion are -----.
 - v) The smallest part of acrystal lattice is called -----.
 - vi) In forward biasing, a p-n offers -----.
 - vii) The value of first Bohr's orbit radius is -----.

SECTION - B (14 x 3 = 42) Marks

Q.2. Attempt any fourteen parts. The answer should not exceed 3 to 4 lines, Except where necessary.

- (i) How do we make the track of electrons beam visible to find e/m?
- (ii) Define source charge and test charge.
- (iii) If $r = 0.053 \text{ nm}$, find the radius of 3rd and 5th orbit.
- (iv) Define the half life of radioactive element.
- (v) Find the resistance of a resistor having green, yellow, black and gold colours band.
- (vi) Explain conductors from the band theory of solids.
- (vii) Find rms value of voltage of its peak value is 2.82V.
- (viii) How a rheostat acts as a potential divider?
- (ix) Explain the term Q-value of Nuclear reaction.
- (x) Define ferromagnetic substance.
- (xi) What is the voltage gain of transistor?
- (xii) How can sensitivity of a galvanometer be increased?
- (xiii) Why do alpha rays have highest ionizing power?
- (xiv) Show mathematically and graphically that A-C current lead $\pi/2$ to A-C voltage.
- (xv) How line spectrum can be used for the identification of element?
- (xvi) Einstein showed that mas-energy are not different. Explain.

SECTION - C (3 x 6 = 18) Marks

Attempt any three questions.

- Q.3 Prove the relation of $V_r = K q/r$
- Q.4 Explain the phenomena of heating effect of current and Joule's law. Write down the formula of Power dissipation.
- Q.5 Describe the three types of strain. What are its SI units?
- Q.6 Find the resonance frequency from LC series circuit. Draw graph for characteristics LC series Circuit.

SECTION - D (3 x 3 = 9) Marks

Attempt any three questions.

- Q.7 Calculate the shortest wave length radiation in Paschin series.
- Q.8 An electron has a speed of 200 m/s, when it enters in a uniform magnetic field of 0.5T calculate the radius of its circular path.
- Q.9 A particle of mass 0.8 kg moves with velocity of 10 m/s. Calculate its de-Broglie wave length.
- Q.10 The resistance of copper wire is 3 ohms at 25°C. Find the resistance of the same wire at 200°C.