

F.Y.B.Sc. SEM – I (CBCS 2018 COURSE) : WINTER - 2018
SUBJECT : PHYSICS : MODERN PHYSICS

Day : Monday
Date : 15/10/2018

Time : 11:00 A.M. TO 2:00 P.M.
Max. Marks : 60

W-2018-0668

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Draw neat diagrams, **WHEREVER** necessary.

Q 1. Attempt any **Two** of the following. (12)

- (a) Show that transition of electron from higher state to lower state in stationary orbits is given by,

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

- (b) Discuss in details renewable energy sources.
(c) Describe electromagnetic spectrum with proper diagram.

Q 2. Attempt any **Two** of the following. (12)

- (a) Explain Ionic bond and covalent bond in details.
(b) Write a note on Bohr's Hydrogen atomic model.
(c) Describe any three application of Laser in details.

Q 3. Attempt any **Two** of the following. (12)

- (a) What is solar cell? Explain. List different types of solar cell.
(b) Prove that for large quantum number, quantum theory reduces to classical theory. Hence explain Bohr's correspondence principle.
(c) Explain properties of Radio waves, microwaves & Infrared waves.

Q 4. Attempt any **Three** of the following. (12)

- (a) Explain absorption and emission of radiation in details.
(b) Write a note on (i) Van der Waals bonds (ii) Metallic bonds.
(c) Calculate binding energy per nucleon and packing fraction in ${}_{20}\text{Ca}^{40}$, whose mass is 39.975 a.m.u.
(d) Explain photovoltaic effect

Q 5. Attempt any **Four** of the following. (12)

- (a) What is the wavelength at which Silicon cell start to absorb light?
(Given: $E = 1.1$ eV, Planck constant = 6.63×10^{-34} Js).
(b) Describe any two applications of electromagnetic waves.
(c) Define the term, electrostatic potential and potential energy.
(d) Define Fill Factor and Efficiency of solar cell. State its expression also.
(e) Sketch the binding energy curve and outline the features of the curve.
(f) Distinguish between non-renewable and renewable energy sources.

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