

F.Y.B.SC. SEM – I (2014 COURSE) : SUMMER - 2018

SUBJECT: PHYSICS: MODERN PHYSICS (P-12)

Day : Wednesday
Date : 18/04/2018

S-2018-0680

Time: 12.00 NOON TO 02.00 PM
Max. Marks: 40.

N.B.:

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the **RIGHT** indicate full marks.
 - 3) Draw neat labeled diagrams **WHEREVER** necessary.
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Q.1 Attempt any **TWO** of the following: (10)

- a) Define the terms (i) Mass Defect (ii) Binding energy (iii) Binding energy per nucleon (iv) Packing fraction
- b) Explain with neat labeled diagram X-ray radiography
- c) Explain the variation of potential energy with inter atomic distance.

Q.2 Attempt any **TWO** of the following: (10)

- a) Calculate the mass defect and binding energy, if the mass of ${}_3\text{Li}^7$ nuclei is 7.01653 amu. Given: mass of proton = 1.008 amu and mass of neutron = 1.009 amu.
- b) What is RADAR? Explain it with neat labeled diagram.
- c) Define following terms (i) Spontaneous emission (ii) Stimulated emission (iii) Optical Pumping (iv) Population inversion

Q.3 Attempt any **TWO** of the following: (10)

- a) Write a short note on covalent bond
- b) What is LASER? Explain different properties and applications of laser.
- c) Explain in brief construction and working of solar cell.

Q.4 Attempt any **FIVE** of the following: (10)

- a) Write any one postulate of Bohr's atomic theory.
- b) What is planks hypothesis of photons
- c) What is electromagnetic wave?
- d) Calculate the energy of the microwave having frequency 2.4 GHz.
- e) Calculate numbers of neutron and protons in given nuclei ${}_6\text{C}^{12}$ and ${}_{92}\text{U}^{238}$.
- f) What is metallic bond?
- g) What are the different renewable energy sources?

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