Code: 15A56103

R15

B.Tech I Year I Semester (R15) Supplementary Examinations June/July 2019

BASIC PHYSICS

(Food Technology)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Define damped, undamped and forced oscillations.
(b) What is coherence?
(c) Describe electric potential and electric field due to an electric dipole.
(d) What is Lorentz force? Write the expression for Lorentz force.
(e) List out the properties of matter waves.
(f) Explain briefly the de Broglie hypothesis.
(g) Define crystal lattice, basis and crystal structure.
(h) What is reciprocal lattice? How it is useful in crystal physics?
(i) Write a short note on the structure of the nucleus.
(j) What is meant by mass defect of a nuclide? Explain.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 (a) What do you mean by angular momentum?
(b) Derive the relationship between angular momentum and kinetic energy.

OR

3 (a) Explain the terms divergence and curl of a vector field.
(b) State and prove Gauss divergence theorem.

UNIT – II

4 (a) Distinguish between inertial and non-inertial frames of references.
(b) Derive the Lorentz transformation equations.

OR

5 (a) What are the basic laws used to deduce Maxwell's electromagnetic equations?
(b) Obtain an expression for wave equation for electromagnetic waves and for velocity of EM waves in free space.

UNIT – III

6 (a) Explain the following terms:
(i) Stimulated emission. (ii) Population inversion. (iii) Metastable state.
(b) Derive the relation between the Einstein's coefficients A and B.

OR

7 (a) Describe the recording and reconstruction processes in holography with help of suitable diagrams.
(b) Write the differences between holography and photography.

Contd. in page 2

Code: 15A56103

R15

UNIT – IV

8 (a) Deduce Bragg's law of X-ray diffraction.
(b) Explain the method of determining the interplanar spacing using powder method of X-ray diffraction.

OR

9 (a) Define crystal lattice, unit cell and primitive cell.
(b) Explain the seven crystal systems with neat diagram.

UNIT – V

10 (a) Define mean free path of electrons.
(b) Discuss the important postulates of free electron theory of metals.

OR

11 (a) Explain the liquid drop model of the nucleus.
(b) What is fission? Explain with neat diagram.

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