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B.Tech I Year I Semester (R15) Supplementary Examinations November/December 2019

# BASIC PHYSICS

(Food Technology)

Max. Marks: 70

Time: 3 hours

### PART – A (Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
  - (a) What is polarization?
  - (b) Define gradient of a scalar field.
  - (c) What are electromagnetic waves?
  - (d) Define a non-inertial reference frame.
  - (e) What is Heisenberg uncertainty principle?
  - (f) What is population inversion?
  - (g) What is forbidden energy gap?
  - (h) Define Bravais Lattices.
  - (i) What is Fermi-energy?
  - (j) What is radioactive decay?

## PART – B

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

# UNIT – I

2 Write the differential equation for the damped oscillation of a particle and solve it. Also discuss various cases.

# OR

3 State and explain Gauss divergence theorem.

## UNIT – II

4 Derive Maxwell's equations and give their physical interpretation.

#### OR

5 What are Galilean transformations? Derive Galilean transformation equation for two inertial frames.

## UNIT – III

6 (a) What are the failures of classical physics?

(b) Derive an expression for the wavelength of matter waves.

# OR

7 How to construct and reconstruct a hologram?

## UNIT – IV

8 State and explain Bragg's law. Mention its applications.

#### OR

9 Differentiate conductors, semiconductors and insulators.

## UNIT – V

10 Discuss various models to explain the properties of nucleus.

#### OR

- 11 (a) What are the similarities and dissimilarities between nuclear fission and fusion?
  - (b) Write a note on elementary particles.

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