

(4)

Or

- (b) What are geometrical structures factor and atomic form factor? Explain the heat capacity and thermal conductivity of materials.

Total Pages—4

M.Sc.-IVS—Phy(CE-404)

2017

Time : 3 hours

Full Marks : 80

Answer from both the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

**(CONDENSED MATTER AND MATERIALS
PHYSICS -II)**

SECTION – A

1. Answer any four of the following : 4 × 4
- (a) Explain the elementary ideas of optical fibres.
 - (b) Distinguish between spontaneous and stimulated emissions.
 - (c) Explain Curie-Weiss law.
 - (d) Write a note on GMR.

(2)

- (e) Explain the role of size and surface volume ratio in nanomaterials
- (f) State and explain Mössbauer effect.

Or

2. Answer all questions :

2 × 8

- (a) Explain Luminiscence.
- (b) What is ESR ?
- (c) Explain Curie point.
- (d) State Curie-Weiss law.
- (e) Define spin waves.
- (f) What are Dirac Fermions ?
- (g) What is Raman effect ?
- (h) Define Mössbauer effect.

SECTION – B

Answer all questions : 16 × 4

3. (a) Explain the principle and working of NMR.

(3)

Or

- (b) Obtain the relation between Einstein A and B coefficients. Discuss the operation of Ruby Laser.

4. (a) Explain in detail the Langerin theory of Diamagnetism and Van Vleck paramagnetism.

Or

- (b) Explain Curie temperature and susceptibility of ferrimagnets and discuss the susceptibility below the Neel temperature.

5. (a) Explain the Landau's theory of diamagnetic susceptibility.

Or

- (b) Explain in detail the Molts theory of spin-dependent scattering of electrons.

6. (a) State Bragg's law and explain the Laue method in the determination of crystal structure of nanomaterials.