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TOPICS FOR INTERNAL ASSESSMENT ASSIGNMENTS: 2017-18

Course: M.Sc. PHYSICS (Final Year)

Important Notes: (1) Students are advised to read the separate enclosed instructions before beginning the writing of assignments. (2) Out of 15 Internal Assignment marks per paper, 5 marks will be awarded for regularity (attendance) to Counseling/ Contact Programme classes pertaining to the paper. Therefore, the topics given below are only for 10 marks each paper.

Paper V: Electrodynamics, Optics and Molecular Spectroscopy

1. Derive Fresnel's formulae for reflection and refraction when the electric vector is polarized parallel to the plane of incidence **5Marks**
2. Discuss second harmonic generation and frequency mixing. **5Marks**

Paper VI: Nuclear, Cosmic Rays & Particle Physics

1. Obtain the criticality condition for a bare homogeneous reactor **5Marks**
2. What are strange particles? Give an account of Gellmann-Nishigima scheme for strange particles **5Marks**

Paper VII: Solid State Physics - I

1. Discuss the temperature dependence of resistivity of metals. **5Marks**
2. What normal and Umklapp processes? Explain how Umklapp processes give rise to thermal resistance. **5Marks**

Paper VIII: Solid State Physics - II

1. Deduce an expression for the space charge density under high field transport. **5Marks**
2. Obtain the expression for diffusion length under excess carrier conditions in semiconductor **5Marks**
