



मैट्स विश्वविद्यालय मुक्त एवं दूरवर्ती शिक्षा कार्यक्रम आरंग, रायपुर (छ0ग0)

MATS UNIVERSITY OPEN & DISTANCE LEARNING CENTRE ARANG, RAIPUR (C.G.)

सत्रीय कार्य / Assignment Work – 2012-13

एम.एस.सी.(पूर्व) भौतिक शास्त्र (M.Sc. Pre. Physics)

Max Marks – 30

Min Marks-12

निर्देश : सत्रीय कार्य के प्रत्येक विषय में कुल 30 अंक हैं। सभी प्रश्नों के अंक समान होंगे। सभी प्रश्न हल कीजिए। (Assignment Work of each paper carries 30 Marks. All questions carry equal marks. Attempt all questions.)

Paper-I

- 1.
- 5.

Paper-II : Classical & Statistical Mechanics

1. Prove the laws of conservation of linear momentum, angular momentum and energy for a system of interacting particles.
2. Write a short note on general feature of central force motion. Differential inertial system.
3. Define Euler angles and derive the Euler's equations of motion in terms of Euler's angles.
4. Show that the Fourier transform of a Hermite-Gauss function :
$$u_n(x) = H_n(x)e^{-x^2/2}, x=0,1,2,3, \dots$$
5. Calculate the force acting on a sphere of radius R, falling through a fluid of viscosity η with the velocity U.

Paper-III : Classical Electrodynamics

1. Obtain an expression for the potential due to a charge distribution.
2. How can you explain the mechanical properties exhibited by electrostatic fields.
3. Obtain Laplace equation for an electric field whose lines of induction are all straight and pass through a common point.
4. What is displacement current? Derive Maxwell's equation.
5. Explain metallic reflection. Describe Thomson scattering briefly.

Paper-IV : Solid State Electronics

1. Explain the Ensemble and Ensemble Averages.
2. Describe the Bose Einstein Condensation.
3. What do you mean by single crystal? Give an example. Distinguish between the crystal and the lattice.
4. What do you mean by Hall Effect? Derive and explain the formula for Hall coefficient and Hall field.
5. What is thermal expansion? Write coefficient of volume for anisotropic solids.

* * * * *