



JHARGRAM RAJ COLLEGE

JHARGRAM – 721 507



DEPARTMENT OF MATHEMATICS

INTERNAL EXAMINATION – 2021- 2022

SEM: V

SUBJECT: MATHEMATICS

PAPER: CC11T

Full Marks: 10

Answer any one question:

1 × 10 = 10

- (a) A Particle moves from rest in a straight line under an attractive force $\mu \times (\text{distance})^{-2}$ per unit mass to a fixed point on the line. If the initial distance from the centre of force be $2a$, then find the time when the distance will be a from the centre of force.
(b) A particle describes the equiangular spiral $r = ae^{\theta}$ in such a manner that the radial acceleration is zero. Prove that the speed and the magnitude of acceleration are each proportional to r .
(c) Eliminate the arbitrary functions and hence obtain the Partial Differential Equations: $x = f(z) + g(y)$

5 + 3 + 2

- (a) Reduce: $t - s + p - q(1 + 1/x) + (z/x) = 0$ to canonical form.
(b) Write down the two dimensional wave equation and specify whether it is parabolic or elliptic or hyperbolic partial differential equation.
(c) Solve: $(x^2 - y^2 - z^2)p + 2xyq = 2xz$

5 + 2 + 3