Roll No.....

Total No. of Sections : 03
Total No. of Printed Pages : 03

Code No. : 04/203(A)

Fourth Semester Examination, May-2018

M.Sc. MATHEMATICS

Paper - II

MECHANICS

Time : 3 Hrs. **Max.Marks : 80**

Note : Section 'A' consists of 10 very short answer type questions, all of which are compulsory and should be attempted first. Section 'B' consists of four short answer type questions with internal options. Section 'C' consists of four long answer type questions with internal choice.

Section - 'A'

Answer the following very short-answer-type questions in one or two sentences : (2×10=20)

Q.1 What is holonomic constraints?

Q.2 Write the function of Hamilton Variable.

Q.3 What is geodesics?

Q.4 Write Poisson identity.

Q.5 What is Rayleigh dissipative function?

Q.6 Write the example of scleronomic constraint.

Q.7 What is Kroneker delta?

Q.8 State Poissons theorem.

Q.9 Write the attraction of uniform circular plate on its axis.

Q.10 What is the physical significance of the Hamilton function?

P.T.O.

Section - 'B'

Solve the following : **(5 4=20)**

Q.1 Derive conservation theorem for generalised momentum.

OR

Write down the Lagrangian equation for .

Q.2 Prove that the shortest distance between two points in a plane is a straight line.

OR

If f does not depend on X explicitly then

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Q.3 Derive Whittaker equations.

OR

Prove that the transformation

$Q = \log\left(\frac{1}{q}\sin p\right)$ and $P = q\cot p$ is canonical.

Q.4 Derive Gauss theorem.

OR

Explain work done by self attracting system.

Section - 'C'

Solve the following : **(10×4=40)**

Q.1 State and prove Donkin's theorem.

OR

State and prove conservation theorem for energy.

Q.2 State and prove Euler's theorem for one dependent and on independent variable.

OR

Derive Lagrange's equation of motion from Hamilton principle.

Q.3 State and prove Lee-Hwa Chung theorem.

OR

Derive the relation between Poisson bracket and Lagrangian Bracket.

Q.4 Derive the potential of uniform spherical shell at external and internal point.

OR

State Laplace theorem and prove it using Gauss theorem.

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