REVA UNIVERSITY

Ph D Entrance Examination Model Question Paper-2014

MECHANICAL ENGINEERING

Duration: 2.00 Hours **Total Marks = 100**

Note:

1) The question paper is in **TWO** parts, viz: Part-I and Part-II.
2) **Part-I** consists 50 questions of objective type carrying 1 mark each (50 x 1 = 50 marks)
3) **Part-II** consists of 25 questions of objective type carrying 2 marks each (25 x 2 = 50 marks)
4) All questions are compulsory.

PART – I **(50 x 1 = 50)**

1. A partial differential equation requires
   (A) exactly one independent variable
   (B) two or more independent variables
   (C) more than one dependent variable
   (D) equal number of dependent and independent variables

2. Using substitution, which of the following equations are solutions to the partial differential equation?

$$\frac{\partial^2 u}{\partial x^2} = 9\frac{\partial^2 u}{\partial y^2}$$

   (A) $\cos(3x - y)$
   (B) $x^2 + y^2$
   (C) $\sin(3x - 3y)$
   (D) $e^{-3\pi x}\sin(\pi y)$

PART –II **(25 x 2 = 50)**

1. The distance between the origin and the point nearest to it on the surface z2 = 1 + xy is

(A) 1 (B) $\frac{\sqrt{3}}{2}$ (C) $\sqrt{3}$ (D) 2

2. Consider the system of simultaneous equations

x + 2y + z = 6
2x + y + 2z = 6
x+y+z =5
The system has
(A) unique solution (B) infinite number of solutions
(C) no solution (D) exactly two solutions