Reg.No. _____

Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – Nov/Dec – 2016

Code : CLASSICAL MECHANICS
Sub. Name : 15MA3003

Semester : 2016-17 ODD
Duration : 3hrs
Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	Derive De'Alemberts principle.	CO1	10
	b.	Obtain the equation of motion for a harmonic oscillator	CO1	10
		(OR)		
2.	a.	Obtain Lagrange's equations in terms of Ruthian function.	CO1	12
	b.	Derive the Legendre transformation	CO1	8
3.	a.	Derive Hamilton's canonical equations of motion	CO2	14
	b.	Discuss the Raleigh Dissipation function	CO2	6
		(OR)		
4.	a.	Discuss the stable and unstable equilibrium	CO2	10
	b.	The kinetic energy of a system is $T=\frac{1}{2}(\dot{x}^2+\dot{y}^2+\dot{z}^2)$ and then potential energy is $V=\frac{1}{2}(k_1x^2+k_2y^2+k_3z^2)$ .Find the eigen frequencies	CO2	10
5.	a.	Derive Lagrange's equation in equilibrium state	CO3	
		(OR)		
6.	a.	Discuss the normal coordinates.	CO3	10
	b.	The potential energy function between two atoms of a diatomic molecule is given by $V=ax^{-1/2}-b^{x-6}$	CO3	10
7.	a.	Derive Hamilton's principle	CO3	10
	b.	Show that the curve of minimum length joining a pair of points in the plane is a straight line.	CO3	10
		(OR)		
8.	a.	Derive the Eulerian angles	CO3	
		Compulsory:		
9.	a.	Define virtual displacement and virtual velocity	CO1	4
	b.	Derive Lagrangian Equation for a system of N particles	CO1	16

ALL THE BEST