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Roll Number:_____

Thapar Institute of Engineering and Technology, Patiala

School of Physics & Materials Science

MID SEMESTER EXAMINATION

B. E. (First Year): Semester-II (2018-19) Course Code: UPH004

Course Name: Applied Physics

11th March, 2019

Time: 2 Hours, M. Marks: 50 Name Of Faculty: **SDT, DPS, PUL, RKR, DBD, PKJ**

Note: Attempt all questions in given sequence. Assume missing data, if any, suitably. Symbols have their usual meaning.

Q1	(a)	Establish the differential equation of motion for damped electrical oscillator. Discuss different kinds of possible motions.	(7)
	(b)	A 500 g block, attached with a spring, is pulled a distance of 20 cm and released. The subsequent oscillations are measured to have a period of 0.8 s. (i) What is the spring constant? (ii) At what position(s) is the block's speed 1.0 m/s?	(5)
	(c)	True or False. Justify your answer. "Logarithmic decrement in mechanical underdamped oscillator is independent of mass".	(4)
Q2	(a)	Describe the principle, construction and working of magnetostriction oscillator.	(7)
	(b)	Consider an auditorium having dimensions 18x25x30 ft^3. The average absorption coefficient of auditorium is 0.1. Calculate the reverberation time. How much area of the auditorium must be covered by a cloth of absorption coefficient 0.2 to reduce the reverberation time to 1.3 s?	(7)
	(c)	True or False. Justify your answer. "Kundt's tube method is capable to detect ultrasonic wave with wavelength of the order of mm".	(4)
Q3	(a)	Show that the Ampere's law is valid for steady currents only. Also discuss the Maxwell's correction in this law.	(7)
	(b)	The resistivity, permeability and permittivity for a conductor are 10^{-7} Ω m, 10^{-6} N/A^2 and 10^{-11} $C^2/N\ m^2$ respectively. At what frequency the skin depth is 1 nm?	(5)
	(c)	True or False. Justify the statement. "Magnetic field is solenoidal in nature".	(4)