Premier University Department of Computer Science and Engineering CSE 1st Semester Final Examination, June 2019

Course Title: Engineering Physics – I
Course Code: PHY-101

Time: 3 Hours

Marks: 50

Answer any Five (5) questions.

- Q1. a) Write the differential equation of a simple harmonic motion. Solve the equation to 2+3+2=7 get displacement and explain the physical meaning of the different terms those appear in the solution.
 - b) A body oscillates with simple harmonic motion according to the equation:

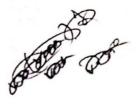
1+1+1=3

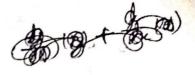
 $y = 7 \sin (8\pi t + \pi/3)$ meter.

Find.

- 1. Displacement
- 2. Velocity
- 3. Acceleration at the time t=3 sec.
- Q2. (3) What is the escape velocity? Show the escape velocity $v_c = (2gR)^{1/2}$, where the 2+4=6 symbols have their usual meaning.
 - With what velocity should a body be projected vertically upwards from the surface of the earth so that it may just attain a height of R/2, where R is the radius of the earth (R=6400km).
- Define the Carnot's cycle and show how the work done in each operation is represented on a pressure volume diagram.
 - 6) An ideal heat engine operates in a Carnot's cycle between 227°C and 127°C. It absorbs 6.0×10⁴ Cal of heat at the higher temperature. How much work per cycle is this engine capable to perform?
- +Q4. a) Write physical significance of entropy. Explain entropy for an adiabatic reversible system.
 - b) Find the change in entropy when 1 gm of ice at 0°C changes to water at 0°C under 1 atmosphere pressure. Latent heat of fusion of ice 80 cal/gm.

Page 1 of 2





			10
Q5.	a	Derive Maxwell's four thermo dynamical relations.	
96.	a)	Show that for a reversible isothermal and isochoric process the Helmholtz function,	6
		F = constant	
	by	A quantity of air at 37°Cand atmospheric pressure is suddenly compressed to 1/3 its original volume. Find, \(\text{V} \)	2+2=4
		1. Pressure	
		2. Temperature.	
Q9.	a)	Explain Doppler's principle. Calculate the apparent pitch of a note due to the motion of the source and the observer.	2+4=6
	6	A person is standing near a railway track and a train moving with a speed of 36 km/hr is approaching towards him. The apparent pitch of the whistle as heard by the person is 800 Hz. Calculate the actual frequency of the whistle. Here, velocity of sound 350 m/s.	4