Vivekananda College of Engineering & Technology, Puttur
[A Unit of Vivekananda Vidyavardhaka Sangha Puttur ®]
Affiliated to VTU, Belagavi & Approved by AICTE New Delhi

CRM08	Rev 1.11	<BS(PHY)>	<04/01/2022>

CONTINUOUS INTERNAL EVALUATION – 1

Dept: BS(PHY)	Sem / Div: I/A,B,C	Sub: Engineering Physics	S Code:21PHY12
11/01/2022	Time: 3-4:30 pm	Max Marks: 40	Elective: N

Note: Answer any 2 full questions, choosing one full question from each part.

QN		Questions	Marks	RBT	CO's
		PART A			
1	a	Define SHM and mention two examples. Derive the differential equations of SHM using Hooke's law	8	L1& L2	CO1
	b	Define force constant and mention its physical significance. Derive the expression for force constant for springs in series and parallel combinations	8	L1& L2	CO1
	c	A mass of 0.5kg causes an extension of 0.03m in a spring and the system is set for oscillations. Find i) The force constant for the spring ii) angular frequency and iii)time period of the resulting oscillation.	4	L3	CO1
		OR			
2	a	Define forced vibration. Discuss the theory of forced vibrations and hence obtain the expression for amplitude and phase.	8	L1& L2	CO1
	b	Define resonance and give the theory of resonant vibrations. Explain sharpness of resonance and discuss the effect of damping on the same.	8	L1& L2	CO1
	c	A 20g oscillator with natural angular frequency 10 rad/s is vibrating in damping medium. The damping force is proportional to the velocity of the vibrator. Calculate the value of damping required for the oscillations to be	4	L3	CO1

	critically damped.(given damping coefficient is 0.17)				
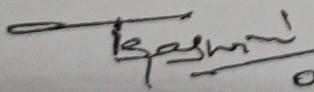
PART B

3	a	What are damped oscillations? Give the theory of damped oscillations.	8	L1& L2	CO1
	b	What are shock waves and mention its properties (any six). Explain any four applications of shock waves.	8	L1& L2	CO1
	c	A vibrating system of natural frequency 500Hz is forced to vibrate with a periodic force per unit mass of amplitude 100×10^{-5} N/kg in the pressure of a damping/unit mass of 0.01×10^{-3} rad/s. Calculate the maximum amplitude of vibration of the system	4	L3	CO1
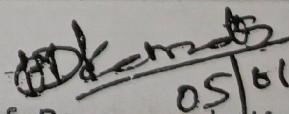
OR

4	a	With a neat diagram explain the construction and working of Reddy shock tube. Mention any four characteristics of it.	8	L2	CO1
	b	Explain Mach number, ultrasonic wave, sub sonic wave and supersonic wave.	8	L2	CO1
	c	The distance between the two pressure sensors in a shock tube is 150mm. The time taken by a shock wave to travel this distance is 0.3ms. If the velocity of sound under the same condition is 340m/s. Find the Mach number of the shock wave.	4	L3	CO1

Prepared by: Prof. Thejaswini L P 05/12/22

HOD: Prof. Ramananda Kamath 05/61/2022