

Code: 20BS1104

**I B.Tech - I Semester – Regular / Supplementary Examinations  
FEBRUARY - 2023**

**APPLIED PHYSICS  
(CIVIL ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.  
2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

			BL	CO	Max. Marks
<b>UNIT-I</b>					
1	a)	Using vector addition method find the resultant of two vectors having equal magnitude of “a” unit and angle between any two consecutive vectors “ $\alpha$ ”.	L3	CO2	8 M
	b)	Distinguish between Inertial and Non inertial frame of reference with one example each.	L4	CO4	6 M
<b>OR</b>					
2	a)	What is simple harmonic motion? Derive a relation for displacement, time period, and acceleration of a particle executing simple harmonic motion.	L3	CO2	10 M
	b)	What are the characteristics of Waves?	L2	CO1	4 M

<b>UNIT-II</b>					
3	a)	Explain different stresses and different strains with diagrams.	L3	CO3	8 M
	b)	Calculate the load that must be suspended from steel wire of 1mm diameter to produce an elongation of 0.02% of its original length. Given Young's modulus of steel is $20 \times 10^{10} \text{N/m}^2$ .	L4	CO5	6 M
<b>OR</b>					
4	a)	Define different types of modulus of elasticity. Discuss factors affecting elasticity.	L3	CO3	10 M
	b)	When an iron wire of 1m length and radius 0.5mm elongates by 0.32mm is stretched by a force of 49N. Calculate elastic constant for iron.	L4	CO5	4 M
<b>UNIT-III</b>					
5	a)	Explain Lee's method to determine coefficient of thermal conductivity.	L3	CO2	10 M
	b)	A steel tank of volume 60L is filled completely with gasoline. How much of gasoline will be spilled out if its temperature is raised by $20^\circ\text{C}$ . Given coefficient of Volume expansion of steel and gasoline are $35 \times 10^{-6} / ^\circ\text{C}$ and $950 \times 10^{-6} / ^\circ\text{C}$ respectively	L4	CO4	4 M
<b>OR</b>					
6	a)	Explain different types of thermal Expansion. Derive a relation between them.	L3	CO2	10 M

	b)	The length of a wire is 1.5m when its temperature is raised by 55°C. Given area of cross section of the wire is $12 \times 10^{-6} \text{ m}^2$ . Calculate the rate of loss of heat by conduction through wire? Thermal conductivity of wire is $1 \text{ Wm}^{-1} \text{ degree}^{-1}$ .	L4	CO4	4 M
<b>UNIT-IV</b>					
7	a)	Explain various factors affecting architectural acoustics and their remedies.	L3	CO2	10 M
	b)	Explain Limitations of Sabine's formula.	L3	CO4	4 M
<b>OR</b>					
8	a)	Define absorption coefficient of a material and describe a method for its determination.	L3	CO2	10 M
	b)	Find the total absorption in the hall of volume $7500 \text{ m}^3$ if the reverberation time is 1.5s.	L4	CO4	4 M
<b>UNIT-V</b>					
9	a)	Give the classification of sensors. Describe the main principles involved in working of a strain sensor.	L3	CO3	7 M
	b)	Explain the working of fiber optic pressure sensors with neat diagram.	L3	CO5	7 M
<b>OR</b>					
10	a)	Explain with suitable diagram how the Fiber optic be used as a temperature sensor.	L3	CO3	7 M
	b)	With neat diagram explain working of magnetostrictive sensor.	L3	CO5	7 M