A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 52006

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Second Semester

Civil Engineering

15UPH206–BUILDING PHYSICS

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The ratio of change in length per unit length is known as CO1- R

   (a) linear strain (b) linear stress (c) logitudinal stress (d) lateral strain

2. Poisson's ratio is the ratio between _____. CO1- R

   (a) Lateral contraction per unit stress and longitudinal elongation per unit stress

   (b) Young's modulus and rigidity modulus

   (c) Lateral contraction per unit stress and longitudinal elongation per unit stress

   (d) Young's modulus and rigidity modulus

3. The optimum reverberation time for auditorium is …….. CO2- R

   (a) 0.5 sec (b) 1.1to 1.5 sec (c) 1.5 sec (d) 1-2 sec

4. An open window is a perfect_____. CO2- R

   (a) Reflector of sound (b) Absorber of sound

   (c) Transmitter of sound (d) Scatterer

5. NDT stands for CO3- R

   (a) near destructive testing (b) nanodimensional testing

   (c) non-detectable testing (d) non destructive testing

6. For the use of pulse echo method, specimen must have….. CO3- R

(a) Small surface (b) Large surface

(c) Intermediate surface (d) Very small surface

7. Which is the case of forced vibrations? CO4- R

(a) Sound produced in flute

(b) Sound produced in organ pipe

(c) Vibrations produced in piano string

(d) Vibrations produced in telephone transmitter during conversion

8. In damped vibration, amplitude of vibration CO4- R

(a) decreases (b) increases

(c) is zero (d) decreases and then increases

9. Which of the following methods can be used to produce nano-powders of oxides? CO5- R

(a) Sol-gel technique (b) Chemical vapour deposition

(c) Mechanical crushing (d) Plasma arching

10. Topology details of a specimen can be examined by CO5- R

(a) optical microscope (b) scanning electron microscope

(c) analytical microscope (d) transmission electron microscope

PART – B (5 x 2= 10 Marks)

11. Define elastic limit. CO1- R

12. What is intensity of sound? Give its unit. CO2- R

13. Write the advantages of liquid penetrating method? CO3- R

14. Define wave motion. CO4- R

15. Distinguish between top-down and bottom-up approach. CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) (i) State Hooke's law of elasticity. Draw stress-strain diagram and discuss the behavior of ductile material under loading CO1- U (12)

(ii) Discuss the factor affecting the elasticity of a material. CO1- U (4)

Or

(b) (i) Calculate Young's modulus of a material in the form of a beam when equal loads are applied at both the ends. CO1- U (12)

		(ii) Iron girders used in buildings are made of I-shaped. Justify.	CO1- U	(4)
17.	(a)	Deduce a mathematical expression to compute the reverberation time of a hall based on Sabine's theory.	CO2- U	(16)
		Or		
	(b)	(i) Explain with necessary theory a method of measuring the absorption coefficient of a material.	CO2- U	(8)
		(ii) Classify the factors affecting the acoustics of building and give their remedies.	CO2- U	(8)
18.	(a)	Elaborate the ultrasonic flaw detector based on pulse echo system through transmission and reflection modes.	CO3- U	(16)
		Or		
	(b)	(i) Describe in detail how liquid penetrant method is using in non-destructive testing.	CO3- U	(8)
		(ii) Explain with neat diagram how will you test the material surfacesusing thermography.	CO3- U	(8)
19.	(a)	Define simple harmonic motion. What are the conditions of SHM? Derive the differential formula for SHM	CO4- U	(16)
		Or		
	(b)	(i) Distinguish between reflection, refraction and diffraction.	CO4- U	(8)
		(ii) Analyze the characteristics of wave motion.	CO4- U	(8)
20.	(a)	Explain in detail the ball milling technique and Physical vapour phase deposition technique for synthesis of nano materials.	CO5- U	(16)
		Or		
	(b)	Describe the principle, describe the construction and working of transmission electron microscope. Also mention its applications	CO5- U	(16)

52006