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

Question Paper Code: 52006

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

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 modulus of elasticity is dimensionally equivalent to_____. CO1- R

   (a) Strain (b) Stress (c) Surface tension (d) Viscosity

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. Among the different characteristics of musical sound which is primarily dependent on the wave form? CO2- R

   (a) Pitch (b)Timbre (c)Intensity (d)Loudness

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

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

   (c) Transmitter of sound (d) Scatterer

5. Which among the following is the last step in magnetic particle test method? CO3- R

   (a) Observation and inspection (b) Demagnetization

   (c) Magnetization (d) Circular magnetization

6. Which of the following methods of inspection uses high frequency of sound waves for the detection of flaws in the castings? CO3- R

(a) Penetrant test (b) Ultrasonic inspection

(c) Pressure test (d) Radiography

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. Which of the following properties of wave is independent of the other? CO4- R

(a) Velocity (b) Wavelength (c) Amplitude (d) Frequency

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. Scanning electron microscopy helps us to _____. CO5- R

(a) See the surface texture of a sample (b) See the inside of a sample

(c) See the atoms of a sample (d) See the electrons of a sample

PART – B (5 x 2= 10 Marks)

11. State Hooke's law. CO1- R

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

13. List the various non-destructive methods to detect flaw of material. CO3- R

14. Define wave motion. CO4- R

15. Tabulate nanomaterials based on its dimensions. CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) (i) Examine the elastic behavior of a material using stress strain diagram. CO1- U (12)

(ii) Discover the factors affecting elasticity of the given 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)	Analyze Sabine's formula for the reverberation time of an auditorium.	CO2- Ana	(16)
		Or		
	(b)	(i) Explain with necessary theory a method of measuring the absorption coefficient of a material.	CO2- Ana	(8)
		(ii) Classify the factors affecting the acoustics of building and give their remedies.	CO2- Ana	(8)
18.	(a)	(i) Draw a block diagram of ultrasonic flaw detector and analyze each one of its components.	CO3- Ana	(12)
		(ii) Compare destructive and non-destructive testing.	CO3- Ana	(4)
		Or		
	(b)	(i) Describe in detail how liquid penetrant method is using in non-destructive testing.	CO3- Ana	(8)
		(ii) Explain with neat diagram how will you test the material surfacesusing thermography.	CO3- Ana	(8)
19.	(a)	(i) Define damped harmonic oscillations. Discuss the effect of damping on oscillatory motion.	CO4- U	(10)
		(ii) Summarize wave motion, longitudinal waves and transverse waves.	CO4- U	(6)
		Or		
	(b)	(i) Distinguish between reflection, refraction and diffraction.	CO4- U	(8)
		(ii) Analyze the characteristics of wave motion.	CO4- U	(8)
20.	(a)	(i) Discuss ball milling technique to synthesize nanomaterials.	CO5- U	(12)
		(ii) Differentiate top-down and bottom-up approach to synthesis nanomaterials.	CO5- U	(4)
		Or		

(b)	(i) Express in detail the construction and working of scanning electron microscope with a suitable schematic diagram.	CO5- U	(12)
	(ii) List the applications of transmission electron microscope.	CO5- U	(4)