Question Paper Code: 51206

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

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 three modulus are connected by the relation of $\frac{9}{Y} = \frac{1}{K} +$ _____.

    (a) $\frac{3}{\eta}$ (b) $\frac{\eta}{3}$ (c) $\frac{2}{\eta}$ (d) none of these

2. The restoring force or recovering force per unit area set up inside the body is called

    (a) elasticity   (b) strain   (c) stress   (d) plasticity

3. _____ is the frequency of the audible sound waves.

    (a) 20Hz-200Hz   (b) 20Hz-20MHz
    (c) 20Hz-20KHz   (d) none of these

4. The lingering effect of sound even after the source producing sound is switched off is known as

    (a) intensity   (b) loudness
    (c) reverberation   (d) echelon effect

5. The liquid is drawn into the crack in liquid penetrant testing due to

    (a) capillary action   (b) surface tension
    (c) high viscosity   (d) all the above

6. To find any defect in electronic circuit modules we can use

    (a) ultrasonic methods   (b) holographic methods

    (c) thermography   (d) magnetic particle tests

7. The dramatic increase in amplitude near the natural frequency of the system is

    (a) damping   (b) critical damping   (c) resonance   (d) none of these

8. Bending of waves around the edges of the obstacles are known as

    (a) diffraction   (b) interference

    (c) polarization   (d) reflection

9. Ball milling containers are rotated at high speed from _____ to _____ rpm around their own axis.

    (a) 200 to 300   (b) 300 to 600   (c) 600 to 900   (d) 800 to 1000

10. Transmission electron microscope operates at high

    (a)pressure   (b)temperature

    (c)vacuum   (d)altitude

<center>PART - B (5 x 2 = 10 Marks)</center>

11. Define elastic limit.

12. Define reverberation time.

13. Write the advantages of liquid penetrating method?

14. List any two characteristics of waves.

15. Write the principle of ball milling method?

<center>PART - C (5 x 16 = 80 Marks)</center>

16. (a) (i) State Hooke's law of elasticity. Draw stress-strain diagram and discuss the behavior of ductile material under loading.   (10)

    (ii) Discuss the factor affecting the elasticity of a material.   (6)

<center>Or</center>

    (b) (i) Arrive at an expression for Young's modulus of the material of the bar which is supported at the two ends and loaded in the middle.   (12)

<center>2</center>

(ii) Mention few advantages of I shaped girders. (4)

17. (a) Derive Sabine's formula for reverberation time by finding rate of growth and decay of sound energy in a hall. (16)

Or

(b) Discuss various factors affecting the acoustics of buildings and their remedies. (16)

18. (a) (i) Differentiate destructive and non-destructive testing methods. (6)

(ii) Explain the process of non-destructive testing of materials using ultrasonic waves by (a) pulse echo system (b) through transmission techniques. (10)

Or

(b) (i) Draw the diagram of thermo graphic camera and mention the parts. (6)

(ii) Write an essay on the thermography principle, working and applications both in industry and medicine. (10)

19. (a) (i) What is SHM? Show that for a simple harmonic oscillator, mechanical energy remains constant and it is proportional to the square of the amplitude. (10)

(ii) Write the characteristic of simple harmonic motion. (6)

Or

(b) (i) (i) Define the term reflection, resonance and superposition of waves. (6)

(ii) Derive Snell's law to describe refraction with necessary diagram. (10)

20. (a) Explain in detail the ball milling technique and Physical vapour phase deposition technique for synthesis of nanomaterials. (16)

Or

(b) (i) Explain the principle, construction and working of transmission electron microscope with neat diagram. (12)

(ii) Differentiate between scanning electron microscope and transmission electron. (4)

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