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BS Physics

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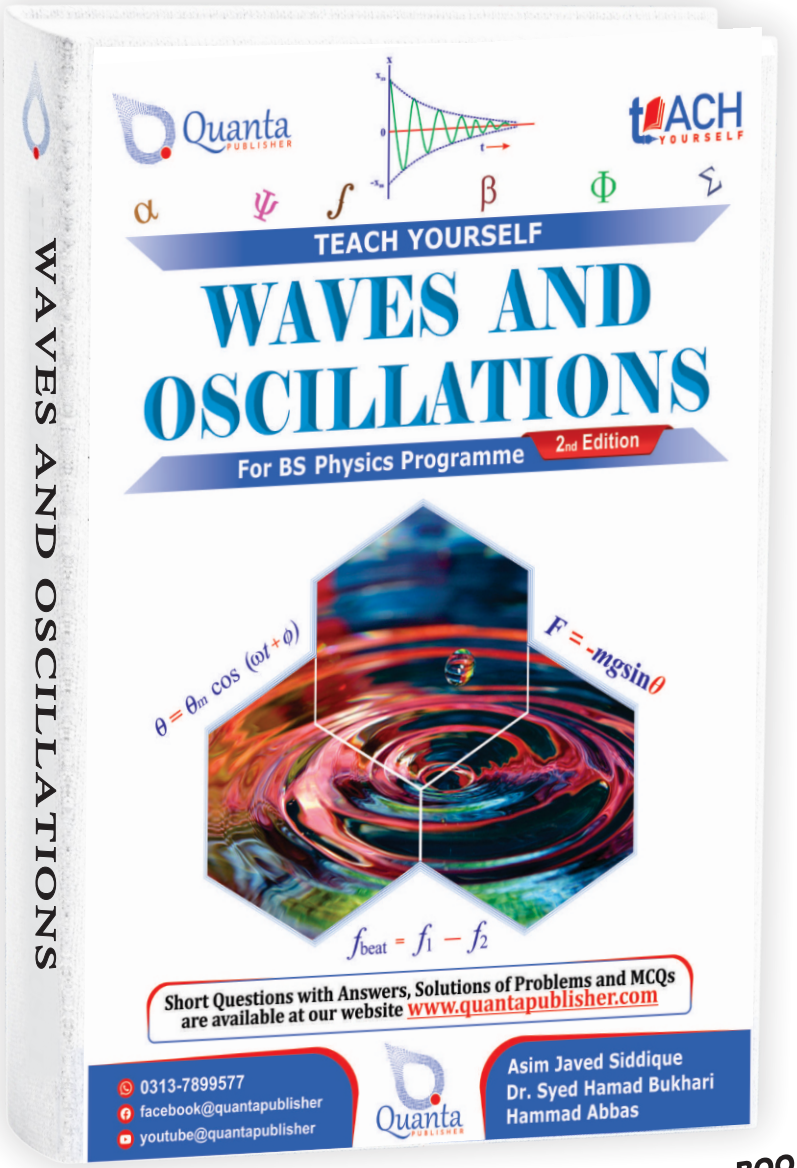

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GC. UNIVERSITY , FAISALABAD

Course Title: Waves & Oscillations
Course Code: Phys-303
3-credit hours

Maximum Marks: 24
Time: 2.10 hours

BS PHYSICS(SEMESTER–I)

SUBJECTIVE

Note: Attempt all questions. Each question carries equal marks

Q. 1(a) What are stationary waves.
Derive conditions of nodes
Derive conditions anti nodes [6 + 2]

(b) The displacement of sinusoidal wave is $y(x,t) = y_m \text{ Sin } (kx - \omega t)$.
Calculate acceleration.

Q.2(a) What is torsional oscillator ?
Derive its equation of motion
Find its time period. [6 + 2]

(b) Calculate speed of a transverse wave in a cord of length 2.15 m
Mass of card is 62.5 g and tension is 487 N.

Q.3 Explain analytical treatment of intensity in Young double slit experiment by using trigonometric method and phasor method and describe condition of maximum and minimum intensity. [8]

UNIVERSITY OF THE PUNJAB

Second Semester - 2018

Examination: B.S. 4 Years Programme

Roll No. .....

PAPER: Physics-II (Waves & Oscillation) **TIME ALLOWED: 15 Mints.**

Course Code: PHY-113 / PHY-12307 Part – I (Compulsory) **MAX. MARKS: 10**

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Each MCQ carries 1 Mark. This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Attempt the all Multiple Choice Questions: **(10x1=10)**

i. Distance covered by a body during one vibration of an oscillating body in terms of A is:

(a) A (b) 2A (c) 3A (d) 4A

ii. In SHM, the restoring force is directly proportional to:

(a) Velocity (b) Acceleration (c) Displacement (d) Time Period

iii. The least distance between node and consecutive anti-node is

(a) λ (b) 2λ (c) $\lambda/2$ (d) $\lambda/4$

iv. According to 1st law of thermodynamics the following quantity remain conserved:

(a) Energy (b) Force (c) Momentum (d) Power

v. The Equation $\Delta U = Q - W$ is statement of law of thermodynamics:

(a) 1st (b) Zero (c) 2nd (d) None of these

vi. Which of the following does not have the same units:

(a) Work (b) Heat (c) Kinetic Energy (d) Power

vii. The temperature scale approved in S-I Units is:

(a) Celsius Scale (b) Kelvin Scale (c) Fahrenheit Scale (d) None of these

viii. The process for which entropy remains constant is:

(a) Reversible Process (b) An irreversible Process (c) 2nd law of thermodynamics (d) None of these

ix. In which cases Doppler's Effect is used:

(a) Radar (b) Sonar (c) To find speed of Star (d) All of these

x. Time period (T) Wave length (λ) and velocity of wave are related:

(a) $\lambda = T/V$ (b) $\lambda = V/T$ (c) $\lambda = TV$ (d) None of these

UNIVERSITY OF THE PUNJAB

Second Semester - 2018

Examination: B.S. 4 Years Programme

Roll No. .....

PAPER: Physics-II (Waves & Oscillation) **TIME ALLOWED: 2 Hrs. & 45 Mints.**

Course Code: PHY-113 / PHY-12307 Part – II **MAX. MARKS: 50**

Attempt this Paper on Separate Answer Sheet provided.

Q.2. Write short answers of the following. **(2 x 10) = 20**

i. What is the frequency of second's pendulum.

ii. Define node and antinode in wave motion.

iii. What is an ideal gas? Write its two properties.

iv. State 1st law of thermodynamics. Write its mathematical form.

v. Convert 100°C in to Kelvin (K) Scale.

vi. What is irreversible process give its an example.

vii. Define Zeroth Law of thermodynamics.

viii. What is principle of superposition.

ix. Define Damped Harmonic motion.

x. Why sound of woman is more shrill as compared to man?

Q.3. (a) What are beats, how these are produced and give their graphical representation. What are their applications?

(b) Prove that Beat frequency is equal to the difference between the frequencies of the combining waves.

(7+3)

Q.4. (a) Define and explain entropy, how entropy and 2nd law of thermodynamics are related to each other?

(b) A small block of ice melts reversibly to water such that its temperature remains 0°C throughout the process. If mass of ice is 235 gm. Find the change in entropy of ice (Heat of fusion is 333 KJ/kg)?

(7+3)

Q.5. (a) Define Simple Harmonic Motion (SHM). Explain relations between Simple Harmonic Motion and Uniform Circular Motion.

(b) State and explain principle of Superposition.

(7+3)