

This question paper contains 2 printed page|

**X—65—2019**

**FACULTY OF SCIENCE**

**B.Sc. (Second Year) (Third Semester) (Regular) EXAMINATION**

**OCTOBER/NOVEMBER, 2019**

**(CBCS Pattern)**

**PHYSICS**

**Paper VI**

**(Waves, Oscillations and Acoustics)**

**(Friday, 29-11-2019)**

**Time : 2.00 p.m. to 4.00 p.m.**

*Time—2 Hours*

*Maximum Marks—40*

*N.B. :— (i) Attempt All questions.*

*(ii) Illustrate your answers with suitably labelled diagrams, wherever necessary.*

1. Explain analytical treatment of stationary waves formed in an open end organ pipe or string free at the other end. 15

*Or*

(a) What are progressive waves ? State the equation of simple harmonic progressive wave travelling along positive direction of x-axis. Using this equation, derive the differential equation of wave motion. 8

(b) The equation of simple harmonic progressive wave is given as

$$y = 5 \sin \frac{2\pi}{60} (34000t - x)$$

with lengths expressed in centimetre and time in second. Calculate

7

(i) amplitude (ii) wavelength (iii) frequency (iv) wave velocity

2. What is damped vibrations ? Derive differential equation for damped harmonic motion and obtain its general solution. 15

P.T.O.

Or

- (a) Explain piezo-electric oscillator for the production of ultrasonic waves. 8
- (b) Explain the detection of ultrasonic using acoustic grating. 7
3. Attempt any *two* of following : 10
- (a) State conditions for good acoustical designs of auditorium
- (b) Investigate the pressure and density changes at displacement node and antinodes.
- (c) Explain oscillatory motion of a particle from energy consideration
- (d) Obtain relation between particle velocity and wave velocity.