

17207

11819

2 Hours / 50 Marks

Seat No.

--	--	--	--	--	--	--	--	--

- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any NINE of the following :

18

- (a) A flywheel is rotating at 90 rpm. Calculate its angular velocity in radian per second and degree per second.
- (b) State Equation of kinetic energy. What is kinetic energy of body
 - (i) at rest
 - (ii) when its velocity is doubled ?
- (c) State the range for infrasonic wave and ultrasonic wave.
- (d) State principle of ultrasonic testing.
- (e) State the range of wavelength of X-rays. Write the formula for minimum wavelength of X-rays.
- (f) Define luminous flux, lumen.
- (g) Define photon. Write any two properties of photon.

[1 of 4]

P.T.O.

- (h) Write any two scientific applications of X-rays.
- (i) What is recoil of gun ? Write the equation of recoil velocity of gun.
- (j) State principle of photometry.
- (k) An accelerated electron emits a quantum of radiation with frequency 8×10^8 cycles per second. Calculate the energy of electron. $h = 6.623 \times 10^{-34}$ Js.
- (l) 100 litres of water is pumped to a height of 30 m. Calculate the work done by the pump.

2. Attempt any FOUR of the following :

16

- (a) Distinguish between centripetal force and centrifugal force.
- (b) A water tank of capacity 18,000 lit is to be filled in 20 minutes by a pump. This water is to be lifted through a height 12 m. If efficiency of pump is 70%. Find the power of pump.
- (c) Explain production of ultrasonic wave by piezoelectric method.
- (d) A scooter start with initial velocity of 12 m/s and accelerate at 0.9 m/s^2 . Calculate.
 - (i) The speed of scooter after 200 m of travel.
 - (ii) Distance travelled by it during 19th second.
- (e) What is ultrasonic testing ? State two advantages & two industrial applications of ultrasonic testing.
- (f) What is necessity of testing methods used in industries ? State the four factors on which NDT methods can be selected.

3. Attempt any FOUR of the following :

16

- (a) Why is acoustical planning of an auditorium necessary ? Which factors affect the acoustical planning of auditorium ?

- (b) State & explain the factors affecting indoor lighting scheme.
 - (c) State four characteristics of photoelectric effect.
 - (d) Find minimum wavelength and maximum frequency of X-ray produced by an X-ray tube working on 50 kV.
 - (e) Define reverberation of sound. Write Sabine's formula for reverberation time. State the factors on which reverberation time depends.
 - (f) A wheel of diameter 3 m increases its speed uniformly from 150 rpm to 300 rpm. in 30 second. Calculate
 - (i) Angular acceleration
 - (ii) Linear acceleration
-

