

17202

21415

2 Hours / 50 Marks

Seat No.

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

Instructions : (1) All Questions are *compulsory*.

- (2) Attempt **all** questions including Question No. 1 which is compulsory.
- (3) Answer each next main Question on a new page.
- (4) Illustrate your answers with neat sketches wherever necessary.
- (5) Figures to the right indicate full marks.
- (6) Assume suitable data, if necessary.
- (7) Use of Non-Programmable Electronic Pocket Calculator is permissible.
- (8) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any NINE:

18

- (a) State the three equation of motion in kinetics.
- (b) State law of inertia according to Newton.
- (c) Calculate the work done when a 50 kg bag is lifted from the ground and kept on table with height 95 cm.
- (d) Define centripetal force with an example.
- (e) State piezo-electric effect.
- (f) State seebeck effect.
- (g) Give thermoelectric series for thermocouple.
- (h) What is photon or quanta of light ?
- (i) Define threshold wavelength and threshold frequency.
- (j) Give phenomenon of X-ray production.
- (k) Define population inversion in LASER production.
- (l) Write expression for minimum wavelength for X-ray.

P.T.O.

2. Attempt any FOUR :**16**

- (a) Define potential energy. A 50 gm stone is ejected from a trap with velocity of 40 m/s. Calculate kinetic energy.
- (b) Define :
 - (i) Range
 - (ii) Time of flight
 - (iii) Angle of projection and
 - (iv) Trajectory in projectile motion
- (c) Write properties of ultrasonic waves.
- (d) State the necessary criteria for selecting a NDT method in practice.
- (e) State principle of working for Pulse-Echo method for ultrasonic testing, using a neat labelled block diagram.
- (f) A train starts from station A. It attend an uniform velocity of 60 km/hr in 3 minutes. Then travels with this velocity for 15 minutes. Then it retards for 5 minutes and come to rest at station B. Calculate distance between station A and B.

3. Attempt any FOUR :**16**

- (a) Differentiate Joule's Law, Seebeck effect and Peltier effect.
 - (b) State thermocouple characteristics.
 - (c) Threshold wavelength for silver is 3600 \AA . Calculate the energy of photoelectrons emitted when it is exposed U.V. light of wavelength 2800 \AA .
 - (d) Draw neat labelled diagram for X-ray production tube.
 - (e) Write properties of LASER.
 - (f) Find impulse and impulsive force when a cricket ball 200 gm with 90 km/hr speed hit the bat and rebound with velocity 100 km/hr. Take 5 millisecond as interactive time.
-