

# 17202

13141

2 Hours / 50 Marks

Seat No.

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- 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 :**

**18**

- (a) State three equations of motion with usual meaning of symbol used.
- (b) If a body of mass 25 kg changes velocity of 20 m/s to 25 m/s, calculate the impulse acting on the body.
- (c) State Newton's third law of motion. Give one example.
- (d) Define (i) centripetal force (ii) centrifugal force
- (e) State any two properties of Ultrasonic Waves.
- (f) State seeback effect
- (g) Define – Neutral temperature and Inversion temperature.
- (h) State Planck's Hypothesis.
- (i) State any two applications of photoelectric cell.
- (j) State any two properties of X-rays.
- (k) State the principle of production of X-rays.
- (l) Give the full form of LASER.

**P.T.O.**

**2. Attempt any FOUR :****16**

- (a) A bullet of mass 80 gm is fired with a velocity of 300 m/s from a gun of mass 8 kg. Find the velocity with which the gun will recoil.
- (b) Define :
  - (i) Trajectory
  - (ii) Angle of projection
  - (iii) Maximum height of projectile
  - (iv) Time of flight
- (c) With neat labelled diagram, explain Piezo-electric method to produce ultrasonic waves.
- (d) State four advantages of NDT method.
- (e) With neat diagrams and procedural steps, explain LPT method.
- (f) A motor cycle with 20 cm wheel diameter has an angular velocity of 40 rad/sec. Calculate its Linear Velocity.

**3. Attempt any FOUR :****16**

- (a) Define Thermo-emf. State the factors on which it depends.
  - (b) State (i) Peltier effect (ii) Joules effect
  - (c) The Photo-electric work function of certain metal is  $5 \times 10^{-19}$  Joules. Calculate its threshold frequency and threshold wavelength. Plancks constant is  $6.625 \times 10^{-34}$  J.S.
  - (d) With neat labelled diagram, describe production of X-rays by using Modern Coolidge Tube.
  - (e) State the four properties of LASER.
  - (f) A body starting from rest is moving with uniform acceleration. If it gains a velocity of 72 km/hr in 10 seconds, find its acceleration and the distance travelled in 6 seconds.
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