

17207

11920

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 of the following:

18

- a) Define :
- (i) Linear velocity
- (ii) Angular velocity
- b) State Newton's third law of motion with example.
- c) Define ultrasonic waves.
- d) Name any two NDT methods used in industries.
- e) State any two engineering application of X-rays.
- f) Define luminous intensity. State its SI unit.
- g) State Planck's hypothesis.
- h) State any two properties of X-rays.

P.T.O.

- i) Define kinetic energy. State its SI unit.
- j) State the principle of photometry.
- k) The energy of photon is 5.28×10^{-19} J. Calculate its frequency (Given $h=6.625 \times 10^{-34}$ JS)
- l) A bullet is fired with the velocity of 300m/s in the direction making an angle of 40° with the horizontal. Calculate maximum height reached.

2. Attempt any FOUR of the following:

16

- a) Define :
 - (i) Projectile motion
 - (ii) Circular motion
 - (iii) Angle of projection
 - (iv) Trajectory
- b) A man pulls a hand roller on a cricket pitch with a force of 150 N inclined at an angle of 45° to the horizontal. Find the work done in pulling the roller over a pitch of 20m long.
- c) Explain piezoelectric method for production of ultrasonic waves.
- d) A body moves along a circular path of radius 60 cm at 3 revolutions per second. Calculate the linear speed and acceleration of body.
- e) State the criteria for selection of NDT methods. State any four points.
- f) Explain LPT method with the help of principle and experimental procedure.

3. Attempt any FOUR of the following:**16**

- a) State four factors affecting acoustical planning of building. Explain how they are to be adjusted for good acoustics.
 - b) Explain principle, construction and working of Bunsen's photometer.
 - c) State any four characteristics of photoelectric effect.
 - d) Calculate the minimum applied voltage required to produce x-rays of 0.51 \AA wave length. ($h = 6.634 \times 10^{-34} \text{ JS}$, velocity of light $= 3 \times 10^8 \text{ m/s}$, $e = 1.6 \times 10^{-19} \text{ C}$).
 - e) An auditorium of volume 6600 m^3 has reverberation time 2.2 seconds. If the total absorbing surface area in the hall is 3000 m^2 , find the coefficient of absorption.
 - f)
 - (i) State any two equation of motion for a body falling freely due to gravity along with the symbol meaning.
 - (ii) A motor cycle 60cm wheel diameter has as angular velocity of 30 rad/sec. Calculate its linear velocity.
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