17207

13141

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 : **18**

(a) Define uniform acceleration and state its SI unit.

(b) While swimming, what force makes a swimmer to move forward ?

(c) State any four properties of ultrasonic waves.

(d) State two points of difference between destructive testing and NDT.

(e) State any four properties of X-rays.

(f) Define intensity of illumination and 1 lux.

(g) Define threshold frequency and threshold wavelength.

(h) State any two engineering applications of X-rays.

(i) State work energy principle.

(j) State any two factors affecting indoor lighting.

(k) Calculate the energy of photon, if frequency of radiation is 8×10^{18} Hz. (Given $\rightarrow h = 6.63 \times 10^{-34}$ Js).

(l) A ball is thrown with a velocity of 50 m/s making an angle of 40° with the horizontal. Calculate the range covered by a ball.

P.T.O.

2. Attempt any four : **16**

(a) Differentiate (four points) between centripetal force and centrifugal force.

(b) A steam boat moves at a speed of 40 km/hr. It requires a force of 120 kN to overcome the water resistance. Find the power developed.

(c) Explain production of Ultrasonics by piezoelectric method.

(d) A wheel 60 cm in diameter turns at 120 rpm :

(i) What is the angular velocity in rad/sec ?

(ii) What is the linear velocity of a point on the rim of the wheel ?

(e) State principle of Ultrasonic Testing (U.T.) and explain Pulse Echo Method with the help of diagram.

(f) State criteria (four points) for selection of Non-Destructive Testing (NDT) Method.

3. Attempt any FOUR : **16**

(a) State four factor affecting acoustical planning of building and state how they are adjusted for good acoustics.

(b) Explain Bunsen's photometer with the help of neat ray diagram.

(c) State and explain Planck's hypothesis.

(d) The energy of X-ray spectrum is 3.3 eV. Find its frequency (given $h = 6.6 \times 10^{-34}$ Js & $1 \text{ eV} = 1.6 \times 10^{-19}$ J)

(e) The volume of a hall is 9000 m^3 and reverberation time is 1.8 sec. If the absorption surface of the hall has area 5000 m^2, determine the coefficient of absorption.

(f) A body starting from rest is moving with uniform acceleration. If it gains a velocity of 72 km/hr in 8 second, find its acceleration and distance covered in 5^{th} second.

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