17918

16117

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 SEVEN of the following: **14**

a) Define:

(i) Velocity

(ii) Acceleration.

b) A motor cycle with 60 cm wheel diameter has an angular velocity 30 rad/sec. Calculate linear velocity.

c) Define projectile.

d) State two properties of ultrasonic waves.

e) State advantages of Non-Destructive tests.

f) What is meant by piezo-electric effect?

Marks

g) Define:

(i) Eco

(ii) Reverberation

h) Define Lumen.

i) State inverse square law of illumination.

j) A luminous flux of a 40 watt bulb is 240 lumen. Calculate the luminous efficiency of the bulb.

2. Attempt any FOUR of the following: **12**

a) State work-energy principle with its mathematical equation.

b) State Newton's laws of motion.

c) Distinguish between. Destructive testing and Non Destructive testing.

d) State the conditions for good acoustics.

e) Draw a neat labelled diagram of coolidge X ray tube and explain production of X ray using by it.

f) State Einstein's photoelectric equation. Explain its significance.

3. Attempt any FOUR of the following: **12**

a) State three equations of motion against gravity. Give meaning of each symbol.

b) Explain LPT method with the principle, procedure and application.

c) Explain Bunsen's photometer with principle, working and construction.

d) A hall of volume 5000 m^3 has reverberation time of 2 seconds If the absorbing surface in the hall amounts 3320 m^2. Determine coefficient of absorption.

e) Find maximum wavelength and maximum frequency of X ray produced by an X ray tube working of 50 kV.

(Given h – 6.62 $\times 10^{-34}$ J – S, velocity of light = 3×10^8 m/s

e = 1.6×10^{-19} coulomb).

f) State applications of photoelectric cell.

Marks

4. Attempt any FOUR of the following: 12

a) A bullet of mass 0.45 kg leaves the barrel of the given with a muzzle velocity of 700 m/s. If the length of the barrel is 80 cm, find its impulse and impulsive force.

b) Define:

(i) Power

(ii) Kinetic energy

(iii) Potential energy

c) Distinguish between Centripetal force and Centrifugal force.

d) The photoelectric work function of certain metal is 3×10^{-19} joules. Calculate the threshold frequency. $h = 6.625 \times 10^{-34}$ J-S.

e) State applications of Light Dependent Resistor. (LDR)

f) Distinguish between Echo and Reverberation.