17202

11819
2 Hours / 50 Marks

Seat No. | | | | | | | | |

Instructions : *(1)* ***All*** *questions are* ***compulsory****.*
(2) Illustrate your answers with neat sketches ***wherever*** *necessary.*
(3) Figures to the ***right*** *indicate* ***full*** *marks.*
(4) Assume suitable data, if ***necessary****.*
(5) Use of Non-programmable Electronic Pocket Calculator is ***permissible****.*
(6) 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 angular displacement. State its S.I. unit.

b) Define momentum. State its S.I. unit.

c) If a body of mass 200 kg changes its velocity from 40 km/hr to 10 km/hr. Calculate impulse acting on body.

d) Define angle of projection and range of projectile.

e) State properties of ultrasonic waves.

f) Define natural temperature and inversion temperature.

g) State Joules law. Give its mathematical equation.

h) State Plank's hypothesis.

i) An acceleration electron emits a quantum of radiation with frequency 8×10^{18} Hz. Calculate energy of electron.

(Given $h = 6.625 \times 10^{-34}$ J-s)

j) State principle of production of X-ray.

k) State any two medical applications of X-ray.

l) Give full form of LASER.

2. Attempt **any four** of following : **16**

a) i) Derive relation between angular velocity and linear velocity.

ii) Calculate the angular velocity with which earth spin about its own axis.

P.T.O.

Marks

b) Distinguish between centripital and centrifugal force.

c) Explain production of ultrasonic waves using piezo-electric method.

d) With neat labeled diagram and procedural steps, explain LPT method.

e) State advantages of NDT.

f) A body is allowed to fall from the terrace of building 200 m high. After what time will it reach the ground, what will be the velocity at that time ?

3. Attempt **any five** of following : **16**

a) Distinguish between Seebeck effect and Peltier effect.

b) Define thermo e.m.f. State the factors on which thermo e.m.f. depend.

c) The energy of photon is 5.28×10^{-19} J. Calculate frequency and wavelength (Given $h = 6.625 \times 10^{-34}$ J-s, $C = 3 \times 10^{8}$ m/s)

d) State any four properties of X-ray.

e) State 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 second. Find its acceleration, total distance covered in 10 second and distance covered in 6^{th} second.
