Sample Test Paper-I

Course Name : Mechanical Engineering Group

Course Code : AE/FE/ME/MH/MI/PG/PT/PS

Semester   : Second

17202

Subject Title : Applied Science (Physics)

Marks   : 25   **Time:1 Hour**

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. Preferably, write the answers in sequential order.

Q.1) Answer any FOUR   **08 Marks**

    a. Define Uniform velocity and uniform retardation with SI units.

    b. State law of conservation of momentum

    c. Define projectile motion with suitable example.

    d. State any two properties of ultrasonic waves.

    e. State any two criteria to select NDT method.

    f. The second hand of a clock is 5 cm long. Calculate the linear speed of its tip.

Q.2) Answer any THREE   **09 Marks**

    a. A stone is dropped from a tower and strikes the ground after 3 second. Find velocity of the stone at the 3rd second and height of the tower.

    b. State law of inertia , Law of momentum with suitable example

    c. A water tank of capacity 1000 litre is to be filled in 5 minute by a pump. Water is required to be lifted through a height of 15m. If efficiency of the pump is 75%. Find power of pump.

    d. State advantages of NDT.

Q.3) Answer any TWO   **08 Marks**

    a. Explain production of ultrasonic waves by piezoelectric method.

    b. Explain principle and procedure of LPT.

    c. A bullet is fired with a velocity of 280 m/s in the direction making an angle of 40°with the horizontal calculate maximum height reached and range of flight.

Sample Test Paper-II

Course Name : Mechanical Engineering Group

Course Code : AE/FE/ME/MH/MI/PG/PT/PS

Semester   : Second

17202

Subject Title : Applied Science (Physics)

Marks   : 25   **Time:1 Hour**

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. Preferably, write the answers in sequential order.

Q.1) Answer any FOUR   **08 Marks**

    a. Define thermoemf.

    b. State Joule's law

    c. State Plank's hypothesis.

    d. State any two properties of photon.

    e. An X-ray tube works on 60 KV. Find the wavelength of X-ray emitted by it.

    f. Define stimulated emission.

Q.2) Answer any THREE   **09Marks**

    a. Distinguish between Seebeck effect and Peltier effect.

    b. The energy of photon is 5.3 eV. Calculate frequency and wavelength of photon.

    c. State any two engineering and medical applications of X-rays respectively.

    d. Describe method of production of X-rays using Coolidge's X-ray tube.

Q.3) Answer any TWO   **08Marks**

    a. State any four characteristics of photoelectric effect.

    b. Explain properties of LASER.

    c. State engineering applications of LASER.

Sample Question Paper

Course Name : Mechanical Engineering Group

Course Code : AE/FE/ME/MH/MI/PG/PT/PS

Semester   : Second

17202

Subject Title : Applied Science (Physics)

Marks   : 50   **Time:2 Hour**

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. Preferably, write the answers in sequential order.

Q.1 Attempt any NINE   **18 Marks**

a. State equations of angular motion. State meanings of symbols used in it.

b. State Newton's third law of motion with suitable examples.

c. A load is pulled 80m along the horizontal by a force of 800 N at 45° to the horizontal. Calculate work done.

d. Define centrifugal force.

e. Draw a circuit diagram for production of ultrasonic waves by piezoelectric method.

f. State Joule's effect.

g. What is thermoelectric series? Write Seebeck effect.

h. State any two properties of photon.

i. State necessary conditions to obtain photoelectric emission.

j. State any two scientific applications of X-rays.

k. Define X-rays.

l. Define optical pumping.

Q.2 Attempt any FOUR   **16 Marks**

a. Define kinetic energy. A vehicle of mass 80 kg is moving with 50 km/hr. Calculate kinetic energy.

b. Define angle of projection, trajectory, time of flight, range.

c. State properties of ultrasonic waves.

d. State any four advantages of NDT methods.

e. State principle, procedure and applications of ultrasonic testing.

f. A train crosses a tunnel in 20 second. At the entry of the tunnel its velocity is 80 km/hr and at exit of tunnel it is 40km/hr. Find the length of tunnel.

Q.3 Attempt any FOUR   **16 Marks**

    a. Distinguish between Seebeck effect and Peltire effect (4 points)

    b. Explain variation of thermoemf with temperature using characteristic curve. Hence define Neutral temperature and Inversion temperature.

    c. The photoelectric work function of metal is 6ev. Calculate threshold frequency and threshold wavelength.

    d. State any four properties of X-rays.

    e. Explain properties of LASER differentiating it from ordinary light.

    f. A ball of mass 150 gm has initial velocity 25 m/s. After hitting a bat, its velocity becomes 45m/s in opposite direction. If a ball remains in contact with a bat for 5ms, Find impulse and impulsive force.