Time allowed: 2.45 hours

Total Marks: 53

Note: Answer all parts from Section 'B' and all questions from Section-C on the E-sheet.
Write your answers on the allotted / given spaces.

SECTION – B (Marks 33)

Q.2: Attempt all parts from the following. All parts carry equal marks. (11×3=33)

i. Identify base and derived quantities from the following:

Volume	Electric Potential	Amount of a Substance
Work	Electric Current	Temperature

OR

What do you mean by zero error? How can we calculate errors in case of screw gauge?

ii. A car is moving with velocity 'v'. On applying brakes, it comes to rest. Write down three changed equations of motion for the car.

OR

Sketch and tell what do you infer from the graph if an object is moving with uniform acceleration?

iii. Compare circular and rotatory motions with the help of daily life examples. Are these terms different / same from each other? How?

OR

What happens to speed, velocity and acceleration when an object moves in a circle with uniform speed?

iv. A bullet of 5 gm is fired from a pistol of 1.5 kg. If the recoil velocity of pistol is 1.5 m/s, find the velocity of bullet?

OR

On a mountain peak, the weight of a boy is 360N. If his mass on the surface of the earth is 40kg then calculate the value of 'g' on the mountain peak.

v. Why it is unsafe to drive a vehicle with worn-out tyres?

OR

Is rolling friction less than sliding friction? In which case do you need smaller force to move the object and why?

vi. What is the difference between states of equilibrium in case of pencil in vertical and horizontal positions? Why it is so?

OR

What will be the net torque in the situation if two children are sitting on the see-saw such that they cannot swing?

vii. Communication satellites appear to be stationary with respect to earth. Why?

OR

What do you mean by gravitational field strength? Does it vary from place to place? Write its value near the surface of earth.

viii. At what altitude the value of g would become one ninth of its value on the surface of earth?

OR

Calculate number of hectograms in one ton of steel? (1ton=1000kg)

ix. Why a small needle sinks in water and huge ships travels easily in water without sinking?
                              OR
Draw a block diagram to briefly explain how fossil fuels are used to produce electrical energy?

x. To what height can a 400W engine lift a 100kg mass in 3s?
                              OR
Calculate the kinetic energy of a car of mass 500kg moving with a velocity of 36km/h. Find the kinetic energy if the velocity of car doubles?

xi. In contrast to a wide bolt, a nail can easily penetrate a hard surface. Justify the statement?
                              OR
Why is the cutting edge of the knife made very thin?

Section – C (Marks: 20)

Note: Attempt all questions. Marks of each question are given within brackets.
                                              (4×5=20)

Q.3: Using diagram explain how measuring cylinder can be used to find the volume of liquids and solids.   **(1+4)**
                              OR
Using diagram explain the construction and working of solar house heating system.   **(2+3)**

Q.4: Two weights 200N and 250N are sitting at the ends of 10m long rod. The rod is pivoted at its centre. Where the third weight would be placed so that the rod is in equilibrium in the horizontal position? The third weight is of 100N (Ignore the weight of rod).   **OR**   **(5)**
An artificial satellite revolves around the earth in an orbit of radius 7400km. Calculate the value of "g" and orbital speed at this height.   **(5)**

Q.5: State and explain law of conservation of momentum with the help of an example.
                              OR   **(1+2+2)**
State Pascal's law. Explain hydraulic braking system in vehicles with the help of diagram.   **(1+2+2)**

Q.6: A body of mass 10kg at rest is subjected to a force of 16N. Find the kinetic energy at the end of 10s.   **(5)**
                              OR
a. Draw speed-time graphs for object moving with constant and uniformly changing speed.   **(2+2+1)**
b. How can the slopes of these graphs be determined?
c. What information do these two graphs provide?

Formulae:

Momentum= mv   w=m g $g_h = G M_e/(R + h)^2$ $P.E = mgh$

$P = W/t$ $F=ma$ $T=W \times d$ $K.E = \frac{1}{2} m v^2$ $v_o = \sqrt{g_h(R+h)}$

Subject: **Physics**