Note: Time allowed for section B and C is 2 hours and 40 minutes.

SECTION "B"   Marks: 32

II.   Attempt any EIGHT Parts out of the following. Each Part carries equal marks.

i.   Find the number of seconds in a year and write the answer in standard form.

ii.   A ball is thrown upward with an initial speed of 5m/s. What will be its speed when it returns to starting point.

iii.   State Newton's First and second laws of motion.

iv.   Define rolling friction. Write methods of reducing friction.

v.   Can a small force ever exert a greater torque than a larger force? Explain.

vi.   Does Newton's law of Gravitation obay Newton's third law of motion? If Yes, then how?

vii.   Why for same height larger and smaller satellite must have same orbital speed?

viii.   A 60g bullet is fired from a gun with 3150J of kinetic energy. Find its velocity.

ix.   Explain how and why camels have adapted to allow them to walk more easily in desert conditions.

x.   The temperature of a normal human body is 37^0c. Find this temperature on the Fahrenheit and kelvin scale.

xi.   Why burns caused by steam at 100^0c on the skin are often more severe than burns caused by water at 100^0c ?

SECTION "C"   Marks: 21

Note: Attempt any THREE questions of the following. Each question carries equal Marks.

III.   (a) Derive the following equations of motion graphically.   4
       i) $S = v_i t + \frac{1}{2} at^2$ ii) $2as = v_f^2 - v_i^2$
       (b) A car of mass 1000kg is running on a circular motorway interchange near swabi with a velocity of 80ms^{-1}, the radius of the circular motor way interchange is 800m. How much centripetal force is required.   3

IV.   (a) State and explain the conditions for complete equilibrium.   4
       (b) At which altitude above earth's surface would the gravitational acceleration be 4.9ms^{-2}.   3

V.   (a) Prove that Kinetic energy of a body of mass m moving with velocity V is K.E= $\frac{1}{2} mv^2$.   4
       (b) An elevator weighing 5000N is raised to height of 15m in 10s, how much power is developed?   3

VI.   (a) How hydraulic lift works on the Pascal's principal? Explain.   4
       (b) How much heat is required to increase the temperature of 0.5kg of water from 10^0 to 65^0c. (Specific heat capacity of water is 4190JKg^{-1} K^{-1}).   3