

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 obey 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°C. Find this temperature on the Fahrenheit and kelvin scale.
- xi. Why burns caused by steam at 100°C on the skin are often more severe than burns caused by water at 100°C?

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)  $S = vit + \frac{1}{2} at^2$
  - ii)  $2as = vf^2 - vi^2$
- (b) A car of mass 1000kg is running on a circular motorway interchange near swabi with a velocity of 80ms<sup>-1</sup>, 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<sup>-2</sup>. 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°C to 65°C. (Specific heat capacity of water is 4190JK<sup>-1</sup> K<sup>-1</sup>). 3