

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. Define the following branches of Physics?
  - A. Heat & Thermodynamics
  - B. Cosmology & Astrophysics
  - C. Bio Physics & Medical Physics
  - D. Electricity & Magnetism
- ii. Define scalar quantities. Give two examples along with symbols?
- iii. If a force 80N acts on a body its momentum changes to 40kg m/s. What is time for which the force acts on the body?
- iv. What is centripetal acceleration? Write its mathematical form.
- v. State graphical method used to find resultant of forces, when forces are neither parallel nor anti parallel?.
- vi. Define equilibrium? Briefly explain dynamic equilibrium.
- vii. Define Solar energy. Describe the process by which solar energy converts into electricity.
- viii. Calculate the power of a pump which can lift 200kg of water through a height of 6m in 10s.
- ix. Explain Young's Modulus.
- x. Define evaporation. How presence of water vapours in air effects the rate of evaporation?
- xi. Explain the term "sea breeze" and "land breeze" in connection with convection of heat.

SECTION "C"

Marks: 21

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

- III. (a) Use velocity-time graph to prove that. 4  

$$S = vit + \frac{1}{2} at^2$$
- (b) A ball is dropped from a height of the building reaches to ground in 8.2s Find height of the building, and velocity of the ball, when it reaches the ground. 3
- IV. (a) Derive equation to measure the velocity of any planet moving in circular path. 4
- (b) The mass of sun is  $1.99 \times 10^{30}$  kg and the radius of the Earth's orbit around the sun is  $1.5 \times 10^{11}$  m. Calculate the orbital speed of the earth. 3
- V. (a) What is Archimedes Principle, Write its mathematical form. 4
- (b) The deepest point in the ocean is 11km below sea level, deeper than Mount Everest is tall, what is the pressure in atmospheres at this depth? 3
- VI. (a) Explain linear thermal expansion of solids. On which factors does it depend. 4
- (b) A railway line made of iron is 1200km long and is laid at 25°C. By how much will it expand in summer when temperature rises to 40°C. 3