

PHYSICS THEORY**2006**

Time: 3 Hours

Max.Marks.75

Note: Attempt **six** questions in all, selecting **three** questions from **Section A**, **two** questions from **Section B** and **one** question from **Section C**.

SECTION "A"

1. (a) Derive the equation $S = V_1t + \frac{1}{2}at^2$ (05)
(b) Define the following: (04)
(i) Random error (ii) Scalars (iii) Specific heat (iv) Speed
(c) A bullet of mass 0.1 Kg is fired with a velocity of 60m/s: calculate the momentum of bullet (03)
(d) In S.I system the unit of work is _____. (Fill in the blank.) (01)
2. (a) State Newton's laws of motion and give one example of each on the first law and third law (05)
(b) Define Equilibrium and describe three states of equilibrium. (04)
(c) What is the mass of an object whose weight is 294 N at the surface of earth? (03)
(d) The pin-hole camera was invented by _____ (01)
3. (a) State the Law of Universal, Gravitation and prove that $M_e = gR^2/G$ (05)
(b) Define the resultant of a vector and describe the addition of vectors by head to tail rule (04)
(c) Write down any three contributions of Muhammad-Bin-Musa Khuwarzmi. (03)
(d) Why should liquid used in a thermometer be a good conductor of heat?(01)
4. (a) State Pascal's principle and describe the construction and working of a hydraulic press with a diagram. (05)
(b) Define Energy, Kinetic Energy and derive $K.E = \frac{1}{2}mv^2$ (04)
(c) A ball is dropped down from a height of 176.4m. How much time will it take to reach the ground. (03)
(d) The speed in a given direction is called _____ (01)
5. (a) Explain the working of refrigerator with the help of a diagram. (05)
(b) Define a Wheel and Axle and determine its mechanical advantage. (04)
(c) Write the following as the powers of 10: (03)
(i) Deca (ii) Mega (iii) Giga (iv) Deel (v) Pico (vi) Micro
(d) The head energy involved in the change of state is called _____ heat. (01)

SECTION "B"

6. (a) Draw the ray diagram of the image formed by a plane mirror and write its characteristics. (04)
(b) Define the following: (04)
(i) Short sightedness (ii) Critical Angle

- (iii) Farad (iv) Magnetic field
- (c) What is the current through a conductor with a resistance of 19 ohms when the potential difference across it is 120V? (03)
- (d) The commercial unit of electricity energy is _____. (Fill in the blank) (01)
7. (a) Describe the construction of a compound microscope with the help of a ray diagram. (04)
- (b) Define Spectrum and describe the waves of which an electromagnetic spectrum consists? (04)
- (c) What is Galvanometer? How is it converted to an Ammeter and Voltmeter? (03)
- (d) The image formed by a _____ mirror is always virtual erect and smaller than the object itself (Fill in the blank) (01)
8. (a) Draw a neat and a labeled diagram of an Electric bell and write its working. (04)
- (b) State the following laws: (04)
- (i) Snell's Law (ii) Ohm's Law (iii) Coulomb's Law (iv) Joule's Law
- (c) The focal length of a concave mirror is 10cm. Where an object should be placed so as to get its real image magnified twice? (03)
- (d) The index of refraction of ruby is less than the index refraction of diamond. Why? (give scientific reason) (01)

SECTION "C"

9. (a) Write the characteristics of Transverse Waves and Longitudinal waves. (04)
- (b) Write down two points of differences between each of the following (04)
- (i) Musical sound and Noise (ii) p type and n type substances
- (c) How much energy is released due to conversion of 10^{-6} kg of mass into energy when the speed of light is 3×10^8 m/s? (03)
- (d) Why is radioactive substance placed in a lead box with the lid made of lead? (Give the scientific reason). (01)
10. (a) What is Radar? Write three uses of Radar? (04)
- (b) Write down four properties of Alpha Rays? (04)
- (c) 40 waves pass through a point on the surface of a pond in 2 seconds. Calculate the wavelength if the velocity of the wave is 3.5 m/s (03)
- (d) In _____ reaction two lighter nuclei are combined to form a heavy nucleus (Fill in the blank) (01)

(THE END)