PHYSICS 2012

Time: 2 ½ Hours **Max. Marks: 68**

Instruction: This paper consisting of Short-Answer Questions (Section "B") and Detailed-Answer Questions (Section "C") will be given after 30 minutes and its total duration will be 2 ½ hours only.

SECTION "B" (SHORT-ANSWER QUESTIONS)

Note: Answer any 14 questions from this section. No answer should exceed 3 to 5 sentences: (42)

2. Define scalar and vector quantities with two examples of each.
3. Define Equilibrium. Write the names of three states of equilibrium. Give one example of each.
4. With the help of trigonometric ratios, find the magnitude of horizontal and vertical components of a vector.
5. A car is moving on a straight road at a speed of 5 m/s. It is accelerated at 3 m/s^2. Calculate its velocity after 4 seconds.
6. Write down three contributions of Al-Beruni in the field of science.
7. State Pascal's principle & write its three uses in daily life
8. Define the following Laws: (i) Boyle's Law
   (ii) Law of conversation of Momentum
   (iii) Newton's third Law of Motion
9. How much amount of heat is required to raise the temperature of 100 gm of water from 20°C to 80°C. (Specific heat of water is 4200 Joules)
10. What is Newton Corpuscular Theory of light. Write down two phenomena which support this Theory.
11. A force of 588 N acts on a box to move it at a distance of 4m in 40 Seconds. Calculate the power.
12. Define the following:
    (i) Alternating Current (A.C) (ii) Electric Field
    (iii) Electrostatic Induction
13. Write three uses of concave mirror.
14. Write three differences between α - rays and β - rays.
15. Derive the relation $w = I^2 Rt$

16. What is a Transistor? Describe two types of transistor with the help of diagrams.
17. Find the resistance of a bulb, if 0.6 A current is passing through the bulb and the potential difference across the bulb is 90 Volt.
18. Define the co-efficient of Linear Expansion and co-efficient of Volumetric Expansion. Write the relation between them.
19. The radius of curvature of a concave mirror is 20 cm. where should an object be placed so as to get its real image magnified twice?
20. Write down three characteristics of the image formed by a plane minor.
21. A force of 100 N acts at an angle of 60° with the horizontal. Find its horizontal and vertical components, where Cos60° = 0.5 and Sin 60° = 0.866
22. Write down any three characteristics of resistances connected in parallel.

SECTION 'C' (DETAILED – ANSWER QUESTION)

NOTE: Attempt any 2 questions from this section. (26)

23.(a) Define potential energy and kinetic energy and derive the equation $K.E = ½ mv^2$ (05)

(b) Define the capacity of a capacitor. Write down three factors upon which capacity of a capacitor depends. (04)

(c) Define the following: (04)
(i) Proton (ii) Echo (iii) Nuclear Reactor (iv) Doping

24.(a) Define Coulomb's Law. (05)

Derive the equation: $F = K\frac{q_1 q_2}{r^2}$

(b) Define Radio Isotopes. Write the uses of following Radio Isotopes (i) Co-60 (ii) I-131 (iii) P-32 (04)

(c) Define the loudness of sound. Write three factors on which the loudness of sound depends. (04)

25.(a) Derive equation $2aS = vf^2 - vi^2$ (05)

(b) Draw a neat labeled ray diagram of simple microscope. Write down the characteristics of the image formed by it and the formula of its magnifying power. (04)

(c) Define the following: (04)
(i) Simple Harmonic Motion (ii) Frequency
(iii) Time Period (iv) Pitch