MODEL QUESTION PAPER
PART - III
PHYSICS, Paper - I
(English Version)

Time: 3 Hours   Max. Marks: 60

SECTION - A

Note: 1) Answer all the questions.   10 x 2 = 20 Marks

   2) Every correct answer carries 2 marks.

   3) All are very short answer type questions.

1.   Write the dimensional equation for coefficient of dynamic viscosity using its formula.

2.   If the coefficient of restitution equals to one explain the behaviour of motion of the colliding bodies having equal masses with reason.

3.   The position vectors of two bodies of masses 2 kg and 3 kg are given as 2i+ 3j+ 5k and 3i-5j+ 7k. Find the position vector of centre of mass of the system.

4.   What is Chandrasekhar limit and mention its value in terms of solar mass?

5.   What is surface tension of a liquid and mention effect of temperature on it?

6.   Write any two applications of Bernoullie's theorem.

7.   Why the glass beaker breaks when cold water sprinkled on it?

8.   What is triple point of water?

9.   State Newton's law of cooling.

   Which one cools faster, body 'A' at higher temperature or body 'B' at lower temperature kept in the same environment or surroundings.

10. State Stephen's law of radiation and express it in mathematical form.

SECTION - B

Note: 1) Answer any six questions.   6 x 4 = 24 Marks

   2) Every correct answer carries 4 marks.

   3) All are Short Answer type questions.

11. Define dot and cross products with one example each.

12. Show that the path of a projectile is parabola.

13. Calculate work done in dragging a body of mass 2 kg up an inclined plane of inclination 60^0 and coefficient of friction 0.2 and length 3m.

14. Derive an expression for escape velocity on a planet.

15. Show that the motion of a simple pendulum is simple harmonic.

16. Explain the behaviour of a wire under gradually increasing load with the help of necessary graph.

17. Write any four differences between isothermal and adiabatic processes.

18. Explain the concept of absolute scale of temperature.

SECTION - C

Note: 1) Answer any two questions.   2 x 8 = 16 Marks

   2) Every correct answer carries 8 marks.

   3) All are long answer type questions.

19. State the law of conservation of Energy and verify it in the case of freely falling object.

   Calculate the total energy of the body mass 5 kg which is freely falling from a height of 100m, at the highest point and at middle and at the lowest point.

20. Explain the concept of moment of inertia.
   Derive an expression for the moment of Inertia about an axis passing through the centre of a rectangular lamina and parallel to its breadth.

21. Explain the procedure to determine the coefficient of apparent expansion of a liquid using specific gravity bottle with relevant theory.