

Part - II

Note: i) Answer any 6 of the following Questions. ii) Question No. 24 is compulsory.

16. Why is the cylinder used in defining kilogram made up of platinum - iridium alloy?
17. Define a radian.
18. An iron ball and a feather are both falling from a height of 10m. What are the time taken by both to reach the ground?
19. State Newton's second law of motion.
20. Write down the various types of potential energy.
21. Define power.
22. State law of conservation of angular momentum.
23. Why is the energy of a satellite negative?
24. A cyclist while negotiating a circular path with speed 20ms^{-1} is found to bend an angle by 30° with vertical. What is the radius of the circular path? (Given $g = 10\text{ms}^{-2}$)

Part - III

6 x 3 = 18

Note: i) Answer any 6 of the following questions. Question No. 30 is compulsory.

25. Write the rules for determining significant figures.
26. Discuss the properties of vector product.
27. Consider a circular road of radius 20 m banked at an angle of 15 degree. With what speed a car has to move on the turn so that it will have a safe turn?
28. State Lami's theorem.
29. What are conservative forces? Give any two examples.
30. Calculate the energy consumed in electrical units when a 75 watt fan is used for 8 hours daily for one month.
31. Deduce the relation between torque and angular momentum.
32. State Kepler's laws of planetary motion.
33. Define gravitational potential.

Part - IV

5 x 5 = 25

Answer all the questions.

34. Explain the propagation of errors in addition and multiplication. (OR)
The value of universal gravitational constant (G) in SI unit is $6.6 \times 10^{-11} \text{Nm}^2\text{Kg}^{-2}$. Convert its value in CGS system.
35. Derive the kinematic equations of motion for constant acceleration. (OR)
Derive the equations of motion for a particle (a) falling vertically (b) projected vertically
36. Explain the motion of blocks connected by a string in horizontal motion. (OR)
Prove the law of conservation of linear momentum.
37. State and explain work-energy principle. Mention three examples for it. (OR)
Derive an expression for escape speed.
38. State and prove parallel axis theorem. (OR)
Derive the expression for moment of inertia of a rod about an axis passing through its centre and perpendicular to the rod.
