



PHYSICS

BOOKS - MBD

MODEL PAPER 2

Exercise

1. Name the device used for measuring the mass of atoms and molecules.



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2. What do you mean by one dimensional motion?



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3. Why is zero vector needed?



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4. Why are tyres made circular?



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5. Two protons are brought together. How will potential energy of the system alter?



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6. An electron is moving towards a proton. Is the work done positive or negative?



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7. Why do all helicopters have two properllers?



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8. Give one example each of central force and non-central force.



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9. What is fluid friction?



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10. What is SI unit of coefficient of viscosity?



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11. Can a system be heated and its temperature remain constant?



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12. When a gas is suddenly compressed, temperature rises. Why?



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13. Why two holes are made to empty an oil tin?



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14. Coefficient of friction depends on

A. nature of two surfaces in contact

B. motion whether sliding or rolling

C. size of the surfaces

D. both (a) and (b)

Answer:



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15. Sand is thrown on tracks covered with snow to

- A. increase friction
- B. decrease friction
- C. make friction zero
- D. make friction infinite

Answer:



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16. We slip easily on a rainy day because coefficient of friction

A. increase

B. decrease

C. become zero

D. becomes infinite

Answer:



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17. Lubricant is used in machine to

A. increase friction

B. decrease friction

C. make friction zero

D. make friction infinite

Answer:



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18. Angle of friction (θ) and angle of repose (α) are related as

A. $\theta < \alpha$

B. $\theta > \alpha$

C. $\theta = \alpha$

D. $\theta = \alpha = 0$

Answer:



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19. Two water droplets merge with each other to form large droplet. In this process

A. energy is liberated

B. energy is neither librated nor absorbed

C. energy is absorbed

D. same mass is converted into energy

Answer:



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20. Surface tension depends on

A. nature of liquid

B. temperature of liquid

C. presence of impurities

D. all of the above

Answer:



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21. When there are no external forces ,the shape of a liquid drop is determined by

A. surface tension of liquid

B. density of liquid

C. viscosity of air

D. temperature of air

Answer:



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22. The surface of the water in contact with the glass wall is

A. plane

B. concave

C. convex

D. both (a) and (b)

Answer:



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23. If common salt is dissolved in water, then the surface tension of saltwater

A. decreased

B. increased

C. not changed

D. first increased then decreased

Answer:



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24. Define and explain dimensional formula and dimensional equation.



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25. What do you mean by positive and negative acceleration?



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26. The horizontal range of a projectile fired at an angle of 15° is 50 m. If it is fired at an angle of 45° , what will be its range?



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27. A heavier and lighter body have the same momentum. Show that lighter body possesses more velocity.



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28. Explain why:- it is easier to pull a lawn mower than to push it.



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29. An electron and a proton have equal momentum. Which has more kinetic energy and what is the ratio between the kinetic energy of electron and proton?



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30. Show that for an isolated system, centre of mass moves with a uniform velocity along a straight path.



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31. Mass of a body is 20 kg at the surface of earth. AT what depth does its mass reduce to 5 kg?



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32. Why do we prefer steel to manufacture a spring?



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33. Calculate the external work done when an ideal gas is expanded adiabatically.



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34. How will you justify that first law of thermodynamics is the law of conservation of energy?



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35. At what temperature will the speed of sound in air become double of its value of $0^{\circ}C$?



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36. Derive an expression for the angle of bending of a cyclist on a curved track.



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37. State law of conservation of energy with examples. Explain the transformation of energy in a simple pendulum.



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38. Discuss the elastic collision in one dimension and calculate the velocities of bodies after the collision.



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39. What is geostationary satellite? Calculate height of geostationary satellite.



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40. Define gravitational potential energy. Find the expression for gravitational potential energy at any point.



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41. Define coefficient of velocity of sound and show that it is $0.61ms^{-1}c^{-1}$.



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42. A tunnel is dug through the centre of the earth. Show that a body of mass m when dropped from rest from one end of the tunnel will execute simple harmonic motion.



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43. Derive the expression for acceleration and tension in a string in a connected motion.



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44. State and explain the law of conservation of linear momentum. Explain recoil of a gun and explosion of a bomb.



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45. Define angle of contact and capillary Give example of capillarity.



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46. What is the difference between viscosity and friction? Derive the expression for the terminal velocity of a sphere falling through a viscous fluid.



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47. Derive expressoin for kinetic energy, potential energy and total energy of a body executing simple harmonic motion. In what positions the energy is wholly kinetic energy or wholly potential energy?



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48. Derive Newton's formula for velocity of sound in air. Point out the error and hence discuss Laplace's correction to find out the velocity of sound.



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