



PHYSICS

BOOKS - JBD PUBLICATION

Mock test paper 2

Exercise

1. Distance is aquantity.

A. 1

B. 3

C. 3

D. 4

Answer:



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2. Ball-bearing converts sliding friction into rolling friction (yes/No)



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3. Mass cannot be converted into energy.(True/False)



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4. Light year is the unit of

A. time

B. distance

C. energy

D. power

Answer:



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5. What is the position vector of centre of mass of two particles of equal masses?



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6. Define thermal equilibrium.



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7. Is S.H.M. always linear?



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8. Define degree of freedom.



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9. What are order of magnitude? Give two examples.



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10. Define one second.

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11. Can an object be at rest as well as in motion at the same time ?

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12. Define force from Newton's first law of motion.



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13. State the principle of conservation of angular momentum.



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14. An elevator of total mass (elevator+ passenger) 3600 kg in moving up with a constant speed of 2 ms^{-1} . A frictional force of 1300 N opposes its motion. Determine the minimum power delivered by the motor to the elevator.



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15. Find the mass of earth (Given the radius of earth $R = 6.4 \times 10^6 \text{ m}$).





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16. Calculate the terminal velocity of air bubble of radius 10^{-5} m rising in water of viscosity 10^{-2} Nsm^{-2} . Density of water 10^3 kgm^{-3} and density of air is negligible as compared to water.



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17. A passenger arriving in a new town wishes to go from the station to a hotel located 10

km away on a straight road from the station. A dishonest cabman takes him along a circuitous path 23 km long and reaches the hotel in 28 min. What is:- the average speed of the taxi,



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18. Does the nature of a vector change when it is multiplied by a scalar?



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19. Two bodies of masses 10kg and 20 kg respectively kept on a smooth, horizontal surface are tied to the ends of a light string. A horizontal force $F = 600 \text{ N}$ is applied to (i) A (ii) B along the direction of string. What is the tension in the string in each case?



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



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21. A lighter body and a heavier body have same K.E. Which one has greater momentum?



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22. Mention some special features of Newton's law of gravitation.



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23. Write short note note on critical velocity.



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24. The molar specific heat of all gases is same.

Is it true?



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



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26. Which waves do not require medium for propagation?



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27. What are standing waves or stationary waves? Why are they so called?



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28. What is simple harmonic motion and prove a simple pendulum oscillates simple harmonically? Also find a relation for its frequency.



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29. What is a simple pendulum? Obtain expression for its angular acceleration. When its bob is displaced through an angle.



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30. What is meant by saying that atmospheric pressure is 75 cm of mercury?



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31. Define coefficient of viscosity. Give its unit.



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32. What is one bar?



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33. Define surface tension.



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34. Where does centre of mass of a triangular lamina lie?



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35. Prove the theorem of parallel axes.



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36. State Theorem of perpendicular axis.



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37. What is rotational analogue of mass?



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38. Show the moment of inertia of a solid about its diameter is $\frac{2}{5}MR^2$



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39. Shakes is a unit of time (yes/no)



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40. Average speed and instantaneous speed are always equal.(True/ False)



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41. Centripetal acceleration has no particular direction. (true/false)



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42. For an elastic collision the value of coefficient of restitution is:

A. -1

B. 0

C. +1

D. 0.5

Answer:



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43. What is the unit of radius gyration?



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44. Write the relation between heat work when heat measured calories and work in Joule?



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45. How many degree of freedom for H_2 ?



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46. In case of a moving source of sound approaching an observer.



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47. If $\vec{A} = 2\hat{i} + 3\hat{j}$ and $\vec{B} = 2\hat{i} + 1\hat{j}$, find the angle between \vec{A} and \vec{B} .



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48. Why is a clean hole made when a bullet is fired at a glass window pane, while it is broken into pieces by a stone thrown at it? Explain.



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49. Find the dimensions of gravitational potential energy.



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50. A man of mass 60 kg stands on a weighing machine in a lift which is moving downwards with a uniform acceleration 2 m s^{-2} . What would be the reading of machine?



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51. Define kinetic energy?



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52. State the principle of conservation of angular momentum.



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53. If a man weighs 250 N on the surface of earth, what will his weight half way down to the centre of earth which is supposed to be spherical of uniform mass density.



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54. Why it is easier to wash clothes in hot water soap solution?



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55. Define cross product of two vectors and state its properties.



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56. Two buildings are 45 m apart. With what velocity must a ball be thrown horizontally from a window 50 m above the ground in one building so that it enters a window 5.9m above the ground in the other building.



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57. Define angle of friction and angle of repose. Find the relationship between them.



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58. prove that in an elastic collision the relative velocity of approach before collision is equal to relative velocity of separation after collision.



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59. Derive Newton's law of gravitation from Kepler's law.



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60. What is Stokes' law? Derive the relation by method of dimensions.



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61. A body cools from $60^{\circ}C \rightarrow 40^{\circ}C$ in 7 minutes. What will be its temperature after next 7 minutes. The temperature of surrounding is $10^{\circ}C$.



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62. Define first law of themodynamics and explain its limitations.



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63. Write the postilates of kinetic theory of gases.



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64. Write one use of echo.





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65. What is simple harmonic motion and prove a simple pendulum oscillates simple harmonically? Also find a relation for its frequency.



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66. Write one use of beats.



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67. What do you mean by wave motion, state its characteristics.



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68. Define latent heat.



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69. State and prove Bernoulli's theorem for liquid having streamline flow.



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70. What is the unit of pressure ?



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71. Derive an expression for the rise of liquid in a capillary tube and show that the height of the liquid column supported is inversely proportional to the radius of the tube.



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72. Define centre of mass.



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73. Define the theorem of parallel axes and apply it to find the moment of inertia of a uniform rod about an axis passing through one of its ends and perpendicular to its length.



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74. Moment of inertia is :



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75. Define angular momentum and find its relation with moment of inertia.



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