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QUESTION

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1. Which of the following set of quantities consists of derived physical quantities only?
- A. Mass, area, temperature
 - B. Energy, amount of substance, length
 - C. Current, pressure, time
 - D. Area, volume, density
2. Which of the following terms is defined as the amount of matter contained in a body?
- A. Density
 - B. Mass
 - C. Charge
 - D. Weight

3. A box is sliding on a rough floor being acted by an external force F_e as shown in fig.1 below. On which of the following is the friction force F_f dependent?

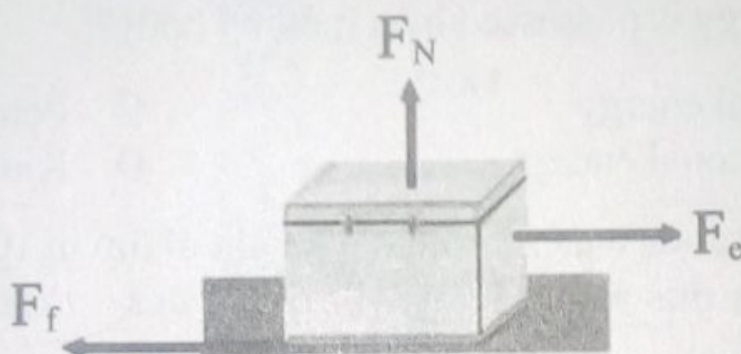


fig.1

- A. On the magnitude of the normal force F_N the floor exerts on the box.
- B. On the magnitude of the external force F_e
- C. On the contact area between the box and the floor.
- D. On the direction of the external force F_e is exerted

4. In which of the following is gravitational attraction force is observed dominantly?

- A. When two charges attract or repel each other.
- B. When two magnets attract or repel each other.
- C. When a ball is falling to the earth.
- D. When a nail is being pulled by a magnet.

5. What is the acceleration of the 2Kg box shown in fig.2 below?

- A. 4m/s^2 to the left
- B. 1m/s^2 to the right
- C. 4m/s^2 to the right
- D. 1m/s^2 to the left

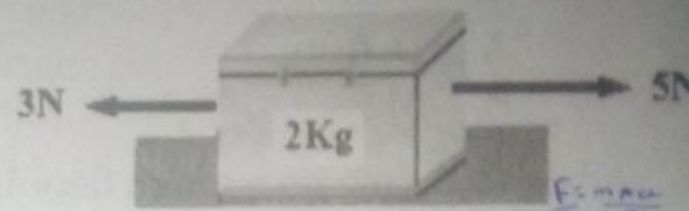


fig.2

$F_{\text{net}} = 5 - 3 = 2\text{N}$
 $a = \frac{F_{\text{net}}}{m} = \frac{2}{2} = 1\text{m/s}^2$

6. Which type of energy is possessed by a moving body?

- A. Electrical energy
- B. Gravitational energy
- C. Potential energy
- D. Kinetic energy

7. A pump lifts 500litres of water through a height of 5m in 10s. Calculate the power developed by this pump. Hint: 1litre of water = 1kilogram of water. (Take $g=10\text{m/s}^2$)

$\text{kg m}^2/\text{s}^2$

- A. 25000W
- B. 1000W
- C. 2500W
- D. 250W

8. Which of the statements given below is correct about velocity and acceleration?

- I. Both velocity and acceleration are vector quantities.
- II. Velocity is measured in m/s^2 while acceleration is measured in m/s .
- III. Velocity is the slope of displacement-time graph while acceleration is the slope of velocity-time graph.

- A. I and III
- B. I and II
- C. II only
- D. II and III

9. Consider the types of motion given below.

- I. Motion of the moon around the earth.
- II. Motion of a freely falling body.
- III. Motion of the wheels of a bicycle.

Which of the following describes the types of motions in I, II, and III?

- A. I-Curvilinear, II-rectilinear, and III-rotary
- B. I-Rectilinear, II-rotary, and III-curvilinear
- C. I-Rotary, II-rectilinear, and III-curvilinear
- D. I-Rectilinear, II-curvilinear, and III-rotary

10. What is the velocity ratio of the pulley system shown in fig.3?

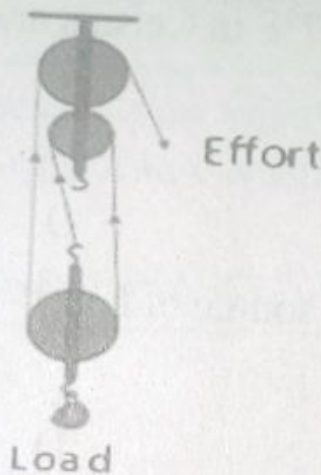


fig. 3

- A. It is 2 because the load moves up 2m when the effort is pulled down by 1m.
- B. It is 2 because the load moves up 1m when the effort is pulled down by 2m.
- C. It is 3 because the load moves up 1m when the effort is pulled down by 3m.
- D. It is 3 because the load moves up 3m when the effort is pulled down by 1m.

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11. The measure of the effectiveness of a force in turning an object about a given axis is called _____.
- A. Force
B. Torque
C. Load
D. Fulcrum
12. Which of the following defines the term temperature of a substance? Temperature is:
- A. the total kinetic energy of the particles of the substance.
B. the average kinetic energy of the fast moving particles of the substance.
C. the total kinetic energy of the fast moving particles of the substance.
D. the average kinetic energy of the particles of the substance.
13. How much is a temperature of 77°F in Celsius and Kelvin scales respectively?
- A. 25°C and 198K
B. 74.8°C and 298K
C. 25°C and 298K
D. 45°C and 350K
14. Which of the following is **not** a source of heat?
- A. The moon
B. The sun
C. Fuel
D. Charcoal
15. If the speed of sound in air, copper and water are v_1 , v_2 and v_3 respectively. Which of the following is the correct relation?
- A. $v_1 > v_2 > v_3$
B. $v_3 > v_2 > v_1$
C. $v_1 > v_3 > v_2$
D. $v_2 > v_3 > v_1$
16. The sound we hear after being reflected from hard surfaces such as a hill or the walls of an empty hall is called _____.
- A. diffraction
B. echo
C. mirage
D. frequency

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17. Which of the following is correct about the properties of magnets?
- A. A magnetic compass always points North because of the earth's magnetism.
 - B. North pole of a magnet produces more magnetic force than South Pole.
 - C. All magnets are natural.
 - D. Like poles of a magnet attract each other while unlike poles repel each other.

18. What is electrostatics? Electrostatics is a science which deals with:

- A. electric fields
- B. electromagnetism
- C. charges at rest
- D. electric circuits

19. Which of the following is correct about the uses of an electroscope?

- I. An electroscope uses to know whether a body is charged or not.
- II. An electroscope uses to know whether a body is charged positively or negatively.
- III. An electroscope uses to measure the current in a conductor.

- A. II only
- B. I, II and III
- C. I and III
- D. I and II

20. Which of the following is equal to 1 Joule?

- A. Kg m/s
- B. $\text{Kg m}^2/\text{s}^2$
- C. Kg m/s^2
- D. $\text{Kg m}^2/\text{s}$

21. When a metal spoon of 200g is submerged in water in a measuring cylinder, the reading increases from 100cm^3 to 150cm^3 . What is the density of this metal spoon?

- A. 0.8g/cm^3
- B. 2g/cm^3
- C. 4g/cm^3
- D. 1.33g/cm^3

22. Which of the following is correct about uniform motion and uniformly accelerated motion?

A. In uniform motion the acceleration is zero.
B. In uniform motion the acceleration is constant different from zero.
C. In uniformly accelerated motion acceleration is zero.
D. In uniformly accelerated motion the velocity is constant.

23. _____ is the way of writing a physical quantity in terms of the fundamental unit or units contained in it.

A. Scientific notation
B. Dimensional expression
C. prefix
D. standard notation

24. Which of the following represents the statement given by: "To every action there is always an equal and opposite reaction."?

A. Newton's fourth law
B. Newton's second law
C. Newton's first law
D. Newton's third law

25. Which of the following is correct about the velocity-time graph shown in fig.4 below?

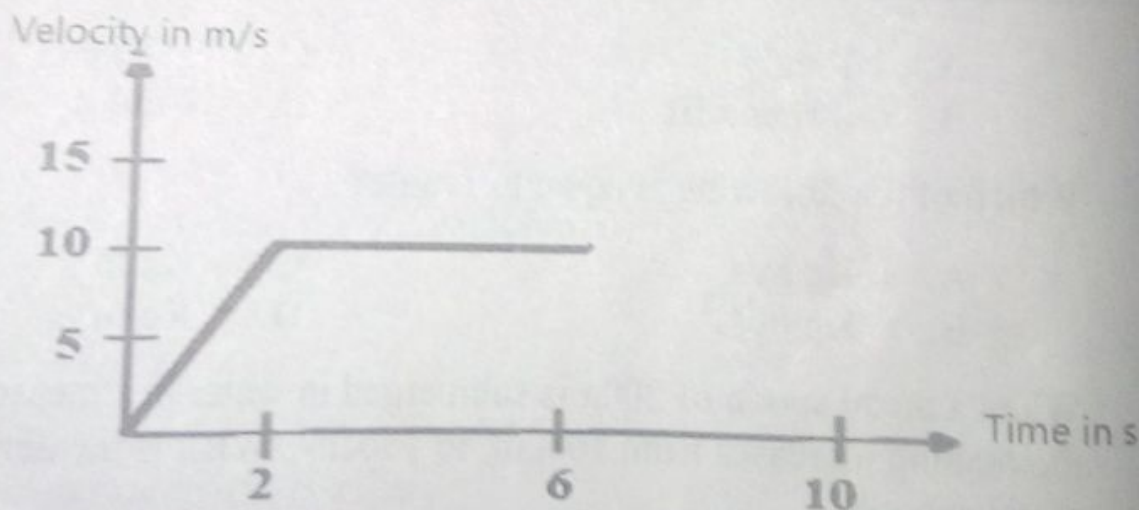


Fig.4

- A. The body starts its motion with $v_i = 5 \text{ m/s}$.
B. The total distance travelled in 6s is 50m.
C. From 0 to 2s the body moves with constant velocity.
D. The distance travelled in the first 2s is 5m.

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26. Which of the following instruments is **not** included as an example of application of atmospheric pressure?
- A. Siphon
B. Drinking straw
C. Lift pump
D. Hydraulic press
27. Which term is defined as a form of energy related to the total kinetic energy of atoms and molecules of a matter?
- A. Heat
B. Temperature
C. Sound
D. Light
28. What is the pressure from a force of 100N on an area of 0.25m^2 ?
- A. 4000Pa
B. 25Pa
C. 400Pa
D. 2.5Pa
29. Which of the following physical quantities has SI-unit of $\frac{\text{J}}{\text{Kg}^\circ\text{K}}$?
- A. Heat
B. Heat capacity
C. Temperature
D. Specific heat capacity
30. If in a hydraulic lift, one of the areas is three times larger than the other a force of 15N is applied to the smaller area, what force will be measured the larger area?
- A. 15N
B. 45N
C. 18N
D. 5N
31. Which term is defined as the opposition to the flow of charges through a conductor?
- A. Conductance
B. Voltage
C. Resistance
D. Current
32. What is the number of seconds in two days?
- A. 172,800
B. 86,400
C. 2880
D. 1440

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33. Which of the following represents the SI-unit for acceleration?
- A. m/s
B. m/s²
C. m²/s
D. m²/s²
34. If you hit a wall with your hand softly, it doesn't hurt. But if you hit the wall with your hand strongly, it hurts. Which of the following Newton's laws can explain most clearly this condition?
- A. Newton's first law of motion.
B. Newton's second law of motion.
C. Newton's third law of motion.
D. Newton's law of gravitation.
35. Which of the following is correct about the relation between work and energy?
- A. Work and energy have different SI-units.
B. A body at rest on the ground is capable of doing work because it possesses gravitational potential energy.
C. possessing little energy means large amount of work can be done.
D. A moving body is capable of doing work because it possesses kinetic energy.
36. Which of the following correctly describes the difference between evaporation and boiling?
- A. Evaporation occurs at all temperatures while boiling occurs at a fixed temperature.
B. Boiling occurs at all temperatures while Evaporation occurs at a fixed temperature.
C. Both evaporation and boiling occur at a fixed temperature.
D. Both evaporation and boiling occur at all temperatures.

37. Materials which do **not** allow the flow of current through them are called _____.

A. Insulators

B. Conductors

C. Resistors

D. Reflectors

38. In **fig.5** below, $X=6\text{cm}$ and $Y=2\text{cm}$. If the volume of the rectangular prism is 48cm^3 , what is the size of Z ?

A. 6cm

B. 4cm

C. 3cm

D. 8cm

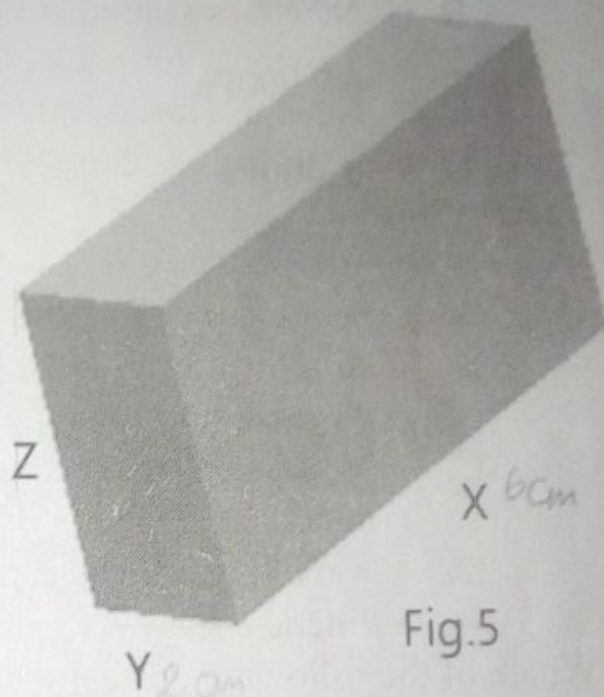


Fig.5

39. Motion with constant velocity is called _____ motion.

A. Circular

B. Non-uniform

C. Uniform

D. Accelerated

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40. Oil of density 800kg/m^3 is poured into a container up to a height 80cm as shown in fig.6 below. What is the gauge pressure exerted on the bottom of the container by the oil? Take $g=10\text{m/s}^2$

- A. 64Pa
- B. 100Pa
- C. $64,000\text{Pa}$
- D. $6,400\text{Pa}$

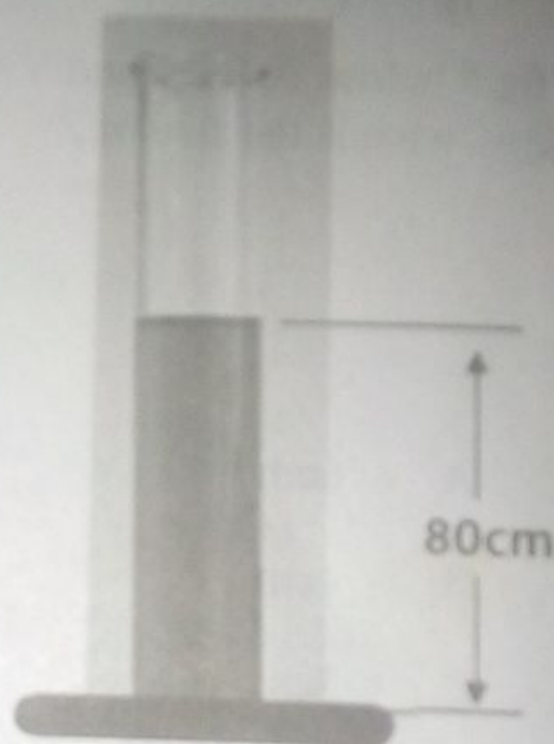


Fig.6