

Mid-Term III Examinations- 2019

S.3 Physics one

Time:2 hours

Instructions

• **Answer all questions**

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1. When a car is suddenly brought to rest, a passenger jerks forward because of
 - A. Inertia
 - B. Momentum
 - C. Gravity
 - D. Friction
2. The width of a metre rule is accurately measured by
 - A. Metre rule
 - B. Vernier caliper
 - C. Tape measure
 - D. Micrometer screw gauge
3. A body moves with uniform acceleration if
 - A. The net force on the body is zero
 - B. Its momentum remains constant
 - C. It covers equal distances in equal times
 - D. The velocity changes by equal amount in equal times
4. A cork held under water rises to the surface when released because the up thrust on it is
 - A. Greater than the weight
 - B. Equal to the weight
 - C. Less than the weight
 - D. Equal to the weight of water displaced
1. When a pin-hole camera is moved closer to the object the image becomes;
 - (i) bigger in size
 - (ii) smaller in size
 - (iii) less brighter
 - (iv) blurred
 - A. (i) only
 - B. (i) and (iii) only
 - C. (i) and (iv) only
 - D. (i) (iii) and (iv) only
5. momentum is given by the product of
 - A. acceleration and mass
 - B. mass and velocity
 - C. displacement and velocity
 - D. mass and displacement
6. what is the velocity ration of the pulley system shown in the figure above?
 - A. 2
 - B. 1
 - C. 3
 - D. 4

7. light energy is reflected when,
- angle of incidence is greater than angle of reflection
 - angle of incidence is equal to angle of reflection
 - angle of incidence is equal to angle of refraction
 - the normal at the point of incidence makes the same angle as the incident ray
8. A hydraulic brake works on the principle of
- High density of a liquid
 - Transmission of pressure in a liquid
 - Distribution of force in a liquid
 - Existence of viscosity in a liquid
9. A force of 20N extends a spring by 10mm. find the extension, in mm caused by a mass of 0.5kg
- | | |
|--------|---------|
| A. 10 | C. 0.25 |
| B. 2.5 | D. 1.0 |
10. Surface tension in a liquid may be weakened by
- Increasing the density of the liquid
 - Adding soap solution
 - Lowering the temperature
 - Increasing the amount liquids
11. When does the eclipse of the moon occur?
- When a bright ring of sun light shows round the edge of the moon.
 - When the moon is between the sun and the earth
 - When the earth is between the sun and the moon
 - When the sun is totally eclipsed by the moon.
12. The principle of conservation of energy states that
- Energy is the ability to do work
 - Energy cannot be created or destroyed but it can be changed from one form to another
 - Energy is composed of kinetic and potential energy
 - Energy will always be converted from one form to another.
13. Gas leaking from a cylinder, at one corner of a room reaches another corner by way of
- | | |
|--------------------|----------------|
| A. Osmosis | C. Evaporation |
| B. Brownian motion | D. Diffusion |
| E. | |
14. When oil of volume $6 \times 10^{-3} \text{cm}^3$ is dropped on a clean water surface, it forms a circular patch of one molecule of diameter 2 cm. find the thickness of oil.
- | | |
|-------------------------------------|--------------------------------------|
| A. $5.24 \times 10^2 \text{ cm}$ | C. $4.77 \times 10^{-4} \text{ cm}$ |
| B. $1.91 \times 10^{-3} \text{ cm}$ | D. $14.32 \times 10^{-4} \text{ cm}$ |

15. The three basic quantities of measurements are
- Length, mass and time
 - Time, density and pressure
 - Mass, frequency and power
 - Area, current and volume
16. Two forces of 8N and 6N act a point at right angles to each other. Find the magnitude of the resultant force
- 14N
 - 2N
 - 10N
 - 48N
17. The diagram above shows a mercury barometer. What is the value of the atmospheric pressure?
- 79cm
 - 77cm
 - 76cm
 - 74cm
18. A uniform metre rule is pivoted at its centre as shown below
If the rule is in equilibrium, find the value of P
- 100N
 - 4N
 - 50N
 - 33.3N
19. The lengths of the mercury column of a thermometer at ice point and steam point are 2 cm and 22cm respectively. The reading of the thermometer when the mercury column is 9cm long is
- 31.8°C
 - 45.0°C
 - 40.9°C
 - 35.0°C
20. What is 100cm Hg in NM-2?
- $\frac{13600 \times 100 \times 10}{100}$
 - $\frac{13600 \times 100 \times 10}{10}$
 - $\frac{13600 \times 100}{100 \times 10}$
 - $\frac{13600 \times 10}{100 \times 100}$
21. Aluminum expands more than copper for the same temperature change. Which of the following is true when a copper- aluminium biometric strip is heated?
- it curves with copper on top
 - It curves with aluminium on top
 - It increases in length
- (i). only
 - (ii). and (iii) only
 - (iii) only
 - (ii) and (iii) only
22. The advantage of s force pump over a lift pump is
- The length of a force pump is less than that of a lift pump
 - A force pump does not use atmospheric pressure to raise water

- C. A force pump uses less energy to raise water than a lift pump
 D. A force pump raises water to a level higher than a lift pump
23. The fins of a car radiator are painted black because black bodies are poor
 A. Radiators of heat C. Transmitters of heat
 B. Reflectors of heat D. Absorbers of heat
24. A car accelerates from 4m/s to 20 m/s in 8 seconds. How far does it travel in this time?
 A. 160m C. 32m
 B. 96m D. 128m
 E.
25. The transfer of heat by the actual movements of molecules of matter takes place
 A. Only in gases C. Only in liquids
 B. In liquids and gases D. In solids and liquids
26. In a liquid, pressure is
 A. Decreased with density C. Transmitted in all directions
 B. Transmitted in a specific direction D. Decreased with depth
27. Brownian motion experiment shows that molecules of gases are
 A. Stationary C. In motion in one direction
 B. More closely packed than molecules in liquid D. In constant random motion
28. A ductile material is that which
 A. easily breaks under compression C. is not elastic
 B. is fragile D. can be moulded into any shape
29. A needle floats on the surface of water because of
 A. Capillary attraction C. Adhesion
 B. Viscosity D. Surface tension

SECTION B

- 30.(a). State the laws of reflection of light. (02 marks)

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(b). State the difference between regular reflection of light and diffuse reflection of light.

(02 marks)

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31.(a). (i). State the principle of moments . (01 mark)

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(ii). State the conditions for a body to be in equilibrium. (02 marks)

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(b). What is meant by centre of gravity? (01 mark)

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32.(a). State Newton's second law of motion. (01 mark)

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(b). A car mass 1000kg moving with a velocity of 20m/s collides head on with another car of mass of 500kg at rest and they stick together. Calculate their velocity after collision.

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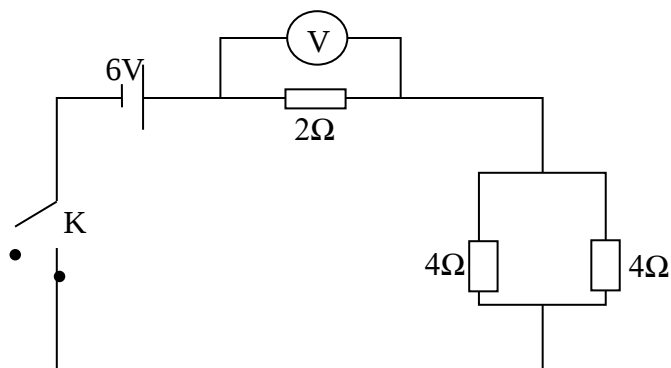
33. (a) Define a Volt. (1 mark)

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(b)



(i) What is the effective resistance in the circuit above? (2 marks)

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(ii) What will be the reading of the voltmeter when the switch K is closed? (2 marks)

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34. (a) State;

(i) Archimedes's Principle.

(1 mark)

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(ii) Law of floatation

(1 mark)

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(b) An object weighs 30N in air and the same object weighs 2N in water.

calculate the relative density of the object.

(3 marks)

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"For a man to achieve all that is demanded of him, he must regard as greater than he is"

END