

NAME.....STREAM.....
SIGNATURE.....

MID TERM III EXAMINATIONS 2019

S.2 PHYSICS

TIME: 1 ½ HOURS

INSTRUCTIONS

- This most correct alternative to section A questions **MUST** be written in the grid drawn.
- Answer **ONLY** 3 questions in section B.
- Answers to section B **MUST** be clearly written and labeled.

ANSWER GRID FOR SECTION A

1.	6.	11.	16.
2.	7.	12.	17.
3.	8.	13.	18.
4.	9.	14.	19.
5.	10.	15.	20.

SECTION A

1. When a car is suddenly brought to rest, a passenger jerks forward because of;
A. Inertia B. friction C. gravity D. momentum
2. A rectangular block of tin is 0.5m long and 0.01m thick. Find the width of the block if its mass and density are 0.45kg and 9000kgm^{-3} respectively.
A. $\frac{0.45}{9000 \times 0.005}m$ B. $\frac{0.005}{0.45 \times 9000}m$ C. $\frac{0.005}{0.45 \times 9000}m$ D. $\frac{0.45 \times 0.005}{9000}m$
3. A cork held under water rises to the surface when released because the upthrust on it is;

- A. Less than the weight
C. greater than the weight
- B. equal to the weight
D. equal to the weight of water displaced.
4. The width of a metre rule is accurately measured by a;
- A. Micrometer screw gauge
C. metre rule
- B. tape measure
D. vernier caliper
5. A body moves with uniform acceleration if;
- A. the velocity changes by equal amount in equal times.
B. its momentum remains constant
C. it covers equal distances in equal times
D. the net force on the body is zero.
6. Which one of the following statements is true when a stone of mass 2kg and that of 1kg are released from the same point at the same time?
- A. The 2kg mass will hit the ground first
B. Both masses will hit the ground at the same time.
C. The 1kg mass will hit the ground first.
D. They fall with different speeds.
7. A solid **Q** sinks deeper in liquid **X** than in liquid **Y** because the;
- A. Up thrust on the solid is greater in liquid X than in Y.
B. Density of liquid X is greater than that of Y.
C. Density of liquid Y is greater than that of Y.
D. Surface tension of liquid X is less than that of Y.
8. A cyclist travelling at a constant acceleration of 2ms^{-2} passes through two points **A** and **B** in a straight line. If the speed at **A** is 10ms^{-1} and the points are 75m apart, find the speed at **B**.
- A. 15.8ms^{-1} B. 17.3ms^{-1} C. 400ms^{-1} D. 20ms^{-1}
9. A crane raises a mass of 500kg vertically upwards at a speed of 10ms^{-1} power developed.
- A. $5.0 \times 10^4\text{W}$ B. $5.0 \times 10^3\text{W}$ C. $5.0 \times 10^2\text{W}$ D. $5.0 \times 10^1\text{W}$
10. When a crystal of potassium permanganate is carefully placed at the bottom of a beaker containing water, it spreads uniformly in the water after some days due to;

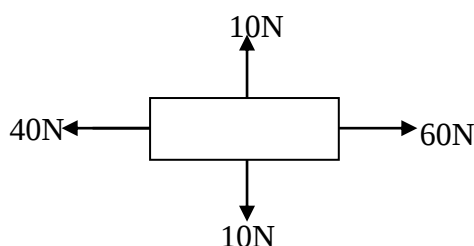
- A. capillarity
- C. surface tension

- B. diffusion
- D. Brownian motion

11. Soap is used to wash clothes because it;

- A. Increases capillarity in the clothes
- B. reduces capillarity in the clothes
- C. reduces surface tension allowing water to penetrate the dirty easily.
- D. increase surface tension allowing water to penetrate.

12.



Force of 60N, 10N, 40N and 10N act on a body as shown in the fig. above. In which direction does the body move?

- A. To the left
- B. Upwards
- C. Down wards
- D. To the right

13. A car of mass 1200kg moving with a constant velocity of 60ms^{-1} is retarded uniformly to rest in 12s. Calculate the retarding force.

- A. $(1200 \times 5)\text{N}$
- B. $(1200 \times 12)\text{N}$
- C. $(1200 \times 60)\text{N}$
- D. $(1200 \times 10)\text{N}$

14. In a liquid, pressure is;

- A. transmitted in a specific direction
- B. transmitted in all directions
- C. decreased with depth
- D. decreased with density

15. Brownian motion experiment shows that molecules of gases are;

- A. Stationary
- B. in motion in one direction only
- C. in constant random motion
- D. more closely packed than molecules in liquid

16. A box of dimension 0.2m by 0.5m by 0.3 is full of a gas of density 200kgm^{-3} . Then mass of the gas is;

- A. $3 \times 10^{-2}\text{kg}$ B. $2 \times 10^2\text{kg}$ C. $6.7 \times 10^3\text{kg}$ D. $0.6 \times 10\text{kg}$

17. The energy transformation involved in a bicycle dynamo is;

- A. Kinetic energy to electrical energy
B. Chemical to light energy
C. Potential energy to chemical energy
D. Electrical to chemical

18. A tin containing 5 litres of paint has a mass of 8.5kg. The mass has a mass of 8.5kg. The mass of the empty tin is 2.0kg. the density of the paint is;

- A. 1.3kgm^{-3} B. $1.3 \times 10^3\text{kgm}^{-3}$
C. $1.7 \times 10^3\text{kgm}^{-3}$ D. $2.1 \times 10^3\text{kgm}^{-3}$

19. Two forces of 3N and 4N act at a point at right angles to each other. The magnitude of their resultant is;

- A. 25N B. 7N C. 5N D. 1N

20. Length, mass and current are;

- A. length of measurements
B. derived quantities
C. measured in metres, new tons and amperes
D. fundamental quantities.

SECTION B

21. (a) State *Archimedes' Principle*. (1 mark)
- (b) Describe a simple experiment to verify the above principle. (4 marks)
- (c) A solid weighs 237.5g in air and 212.5g when completely immersed in a certain liquid. when completely immersed in water, it weighs 206.3g. Find;
- (i) the relative density of the liquid. (2 ½ marks)
- (ii) The relative density of the solid (2 ½ marks)
22. (a) What is meant by efficiency of a machine? (1 mark)
- (b) Draw a pulley system of velocity ratio 3. (2 marks)
- (c) State one reasons why the efficiency of a machine is always less than 100%. (1 mark)
- (d) A 50 kg mass is moved along an incline of length 5m and height 4m by applying an effort of 350N. Find;
- (i) the mechanical Advantage. (2 ½ marks)
- (ii) velocity ratio (2 ½ marks)
23. (a) Define the following;
- (i) Velocity (1 mark)
- (ii) Momentum (1 mark)
- (b) State the law of conservation of linear momentum. (1 mark)
- (c) A bullet of mass 20g is fired into a block of wood of mass 400g lying on a smooth horizontal surface. If the bullet and the wood move together with speed of 20ms^{-1} , calculate;
- (i) the speed with which the bullet hits the wood. (3 marks)
- (ii) the kinetic energy lost. (3 marks)

(d) State the energy changes involved above. (1 mark)

24. (a) Define the term pressure. (1 mark)

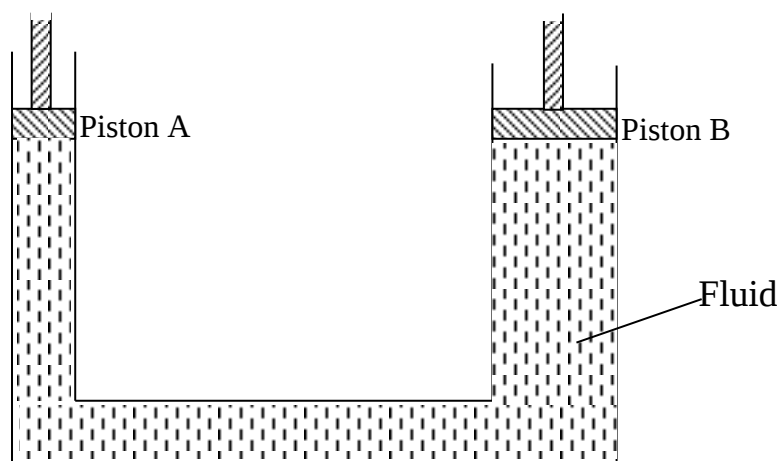
(b) (i) Describe how a simple mercury barometer can be set up to measure the atmospheric pressure. (3 marks)

(ii) the difference between the atmospheric pressure at the top and bottom of a mountain is $10,000\text{Nm}^{-2}$. If the density of air is 1.25kgm^{-3} .

Calculate the height of the mountain. (2 ½ marks)

(c) (i) State the principle of transmission of pressure in fluids. (1 mark)

(ii) In the figure below, Piston A has diameter of 14cm. while B has diameter of 280cm. if a force of 77N is exerted on Piston A, calculate the force exerted by Piston B. (Area of Piston = πr^2)



(2 ½ marks)

END