Our country, our future

S3 PHYSICS

Exam 1

DURATION: 2 HOUR

Instructions to Candidates

Answer all questions in section A and section B.

Fill answers for section B in the spaces provided on the question paper.

Where applicable use:

Acceleration due to gravity	g	=	$10ms^{-2}$.
Density of water		=	$1000kgm^{-3}$.
Speed of light in vacuum	c	=	$3 \times 10^{8}ms^{-1}$.
Speed of sound in air	v	=	$320ms^{-1}$.

Section A

1. The advantage of alcohol over mercury in a thermometer is.

   A. It is a better conductor. B. It does not wet glass.

   C. It is opaque. D. It has a lower freezing point.

2. The temperature at which molecules of a gas stop moving is called.

   A. Thermodynamic temperature. B. Celsius temperature.

   C. Freezing point. D. Absolute zero temperature.

3. Which of the following is correct about a shiny surface?

   (i) They are good radiators of heat (ii) They are poor radiators of heat

   (iii) They are good absorbers of heat (iv) They are poor absorbers of heat

   A. (i) and (iii). B. (i) and (iv) C. (ii) D. (ii) and (iv)

4. When a needle is carefully placed on water it floats. Which of the following will make the

needle sink.

(i) Addition of detergent. (ii) Heating the water. (iii) Cooling the water.

A. (i) only. B. (i) and (ii) C. (i) and (iii) D. (iii) only

5. The following are vector quantities except

A. displacement B. momentum

C. volume D. weight

6. **Fig 1**

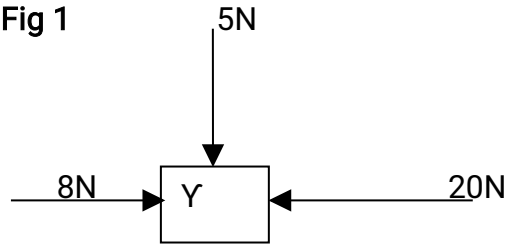


Figure 1 shows three forces 8N, 5N, and 20N acting on a particle Y. Find the magnitude of the resultant.

A. 13N B. 25N

C. 28N D. 33N

7. When a body of mass 1kg is given an acceleration of $1ms^{-2}$ the force acting on it is called

A. gravity B. weight

C. friction D. newton

8. An inclined plank of wood 4.5m long is used to raise a load through a vertical height of 90cm. Find the velocity ratio of the system

A. 20 B. 5

C. 2.0 D. 0.5

9. Which of the following is the correct order of the process involved in making bricks?

A. Moulding → mixing clay soil and water → firing → drying →

B. mixing clay soil and water → firing → drying, moulding

C. mixing clay soil and water → moulding → drying → firing →

D. moulding → drying → mixing clay soil and water → firing →

Sound waves are

(i) Longitudinal waves

(ii) Produced by vibrations

(iii) able to travel through empty space

A. (i) and (ii) only.

B. (i) and (iii) only

C. (ii) and (iii) only

D. (i) (ii) and (iii)

10. Surface tension is a demonstration of:

A. Adhesive forces. B. Cohesive forces.

C. Collision among molecules. D. Random motion of molecules.

11. $10cm^3$ of A liquid of density 0.7 gcm^{-3} is mixed with $15cm^3$ of liquid of density $1.3gcm^{-3}$. Assuming no change in the total volume, density of the mixture is.

A. $0.80gcm^{-3}$ B. 0.94 gcm^{-3} C. 1.00 gcm^{-3} D. 1.06 gcm^{-3}

12. Which of the following sets includes only vector quantities?

A. weight, acceleration, momentum. B. energy, potential, momentum.

C. mass, velocity, force. D. heat capacity, power, time.

13. Brownian motion shows that:

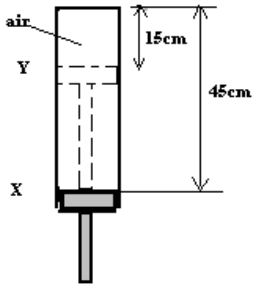
(i) Matter is made of particles

(ii) Particles in matter are constantly moving

(iii) There are forces among particles.

A. (i) and (ii) B. (i) and (iii) C. (ii) and (iii) D. (i), (ii) and (iii)

14. In the diagram below the piston is moved from point X to point Y at a constant temperature.



The pressure of the air inside the cylinder will be

A. Tripled B. Doubled. C. Reduced by a half. D. Unchanged.

15. When a stone is projected vertically up, it has,

(i) zero potential energy when it is moving

(ii) zero kinetic energy when at the highest position

(iii) maximum potential energy when it is at rest on the ground.

(iv) maximum potential energy at the highest point of its flight.

A. (i) and (ii) B. (i) and (iii) C. (ii) and (iii) D. (ii) and (iv)

16. Which of the following can occur when a ray of red light travels from water to glass?
(i) Change in direction, (ii) decrease in velocity (iii) total internal reflection
A. (i) and (ii) B. (i), (ii) and (iii) C. (ii) and (iii) D. (ii) only

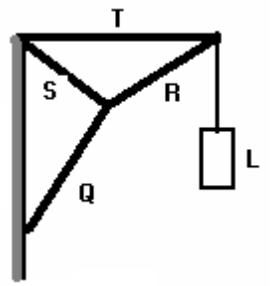
17. Waves of frequency f and wave length λ are produced in a string. How will the frequency and wave length change when the tension in the string is increased?

	f.	λ
A	Increase	Constant
B	Constant	Increase
C	Increase	Increase
D	Constant	Constant

18. Lunar eclipse is when the
A. Sun is between the moon and the earth. B. Moon is between the earth and the sun.
C. Earth is between the moon and the sun. D. Moon is out of line with the earth and sun.

19. An object is placed 6cm from a spherical mirror. The image is formed 10cm behind the mirror. Which of the following is true about the mirror and the image?
(i) Concave (ii) Convex (iii) Real image (iv) Virtual image
A. (i), (iii) B. (i), (iv) C. (ii), (iii) D. (ii) and (iv)

20. The structure below shows wooden beams supporting a load L. Identify the ties.



A. T only B. S only C. T and S D. Q and R

Section B

22. (a) What is magnetic induction? (1mark)
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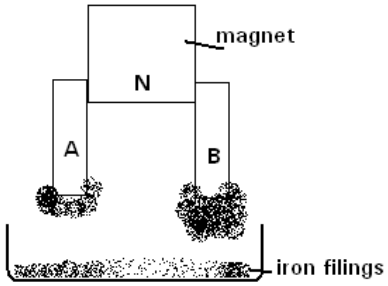
(b) The diagram here shows pieces of metal A and B attached on the pole of a magnet and placed near a dish containing iron filings.



(i) Explain what is observed in each case when the magnet is detached. (2mark)

A……

B……

(ii) State magnetic properties of A (1marks)

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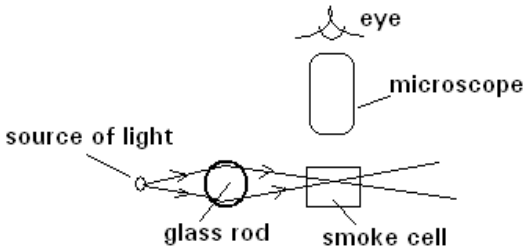
23. (a) The diagram below shows an arrangement used to observe Brownian motion.



(i) What is the function of the glass rod? (1mark)

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(ii) State what is observed.

(1mark)

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(iii) Explain the observation above. (2mark)

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24. (a) Define diffraction of waves. (1mark)

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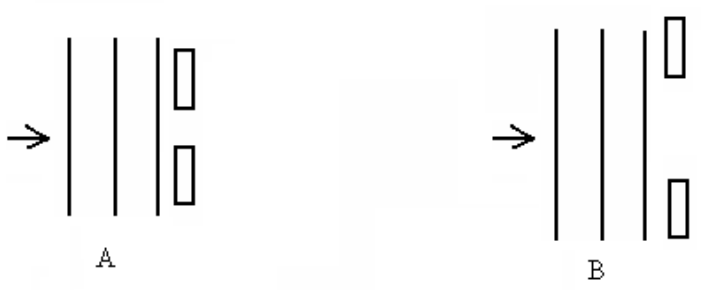
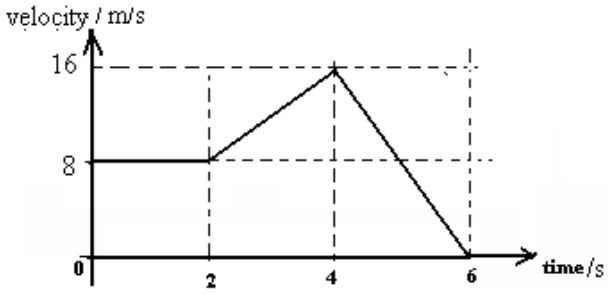
(b) The diagrams below show water waves incident on a narrow gap, A and a wide gap, B.



In both cases sketch the shape of waves passing through the gaps.

(2marks)

25. The graph shows the motion of a body between two places.



(a) Describe motion of the body. (3marks)

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(b) Find distance traveled by the body in the last 2 seconds. (2marks)

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26. (a) What is a neutral point as applied to magnetism? (1mark)

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(b) Describe with the aid of a diagram how a steel bar can be magnetized by electrical method

(4marks)

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END