NAME……STREAM……

535/1
Physics
Paper 1
2019

NSANGI SECONDARY SCHOOL

S.3 END TERM THREE 2019 EXAMINATION

PHYSICS PAPER ONE

TIME: $1\frac{1}{2}$ HOURS

Instructions:

- Attempt **all** questions in sections **A** and **B.**
- Write answers to section **A** in the grid provided.
- Write answers to section **B** in the spaces provided for each question.
- ***You may find the following constants useful:***
- *Acceleration due to gravity g* = *10 m s^{-2}*
- *Specific heat capacity of water* = *4200 J kg^{-1} K^{-1}*
- *Density of pure water* = *1000 kg m^{-3}*

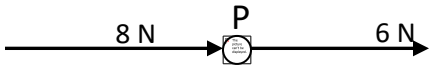
1.	6.	11.	16.
2.	7.	12.	17.
3.	8.	13.	18.
4.	9.	14.	19.
5.	10.	15.	20.

SECTION A

1. A spring is stretched by hanging a piece of metal from it. What is the name given to the force that stretches the spring?

   A. Friction B Mass C Pressure D weight

2. Which of the following is false with respect to convex mirrors?
   A. Images are virtual for all real object positions
   B. Images are diminished for all real object positions
   C. The image is always between the optical Centre and focal point
   D. They are used as rear-view mirrors in vehicles

3. Fig. 1 

Two forces of 6 N and 8 N act on object P as shown in the figure 1 above. The resultant force on the object is

   A. 1.33 N B. 2 N C. 10 N D. 14 N

4. A body starting from rest is uniformly accelerated to a velocity of 40 ms^{-1} in 5 seconds. Calculate the distance travelled in this time interval.

   A. 8 m B. 14 m C. 100 m D. 200 m

5. An S1 student made a record 1.34 cm in a lesson on measurements. If taken correctly, which instrument did the student use to take the measurement?

   A. Metre tape B. micrometer screw gauge

   C. Vernier calipers D. tape measure

6. Which of the following statements are conditions for a body to stay in mechanical equilibrium?

   (i). The sum of forces in one direction is equal to the forces in the opposite direction.
   (ii). The clockwise forces are equal to anticlockwise forces.
   (iii). The sum of moments about a chosen point is zero.
   (iv) The body rotates in one direction.

   A. (i) and (iv) only B. (ii) and (iii) only

   C (i), (ii) and (iii) only D. (i) and (iii) only

7. Figure 2 shows a uniform meter rule pivoted at its center. A mass of 200 g is hanging at the 5 cm-mark and the meter rule balances horizontally when a mass, m_1 is hang at the 70 cm-mark.

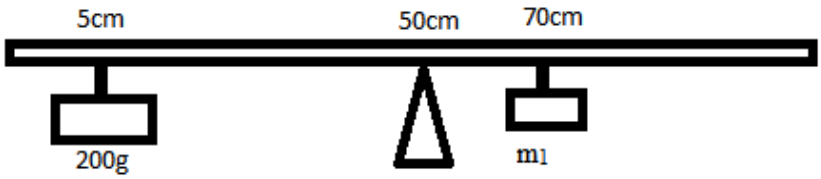


Fig. 2

Calculate the value of m_1

A. 14.3 g B. 45.0 g C. 143 g D. 450 g

8. The notch effect can be increased by
   A Making the notch to be under tension
   B. Making the notch to be under compression
   C. Making the notch smooth
   D. Putting a support under the notch

9. The sharpness of an image formed in a pin hole camera can be increased by
A Widening the pin hole B. Narrowing the pin hole
C. Moving the object closer to the pin hole D. Making the pin hole camera shorter

10. A Pascal is
   A a unit for measuring pressure
   B a pressure exerted normally on a body of area $1m^2$ by a force of 1N
   C a force exerted on a body of area $1m^2$ by a pressure of $1Nm^{-2}$
   D a pressure at sea level

11. A stone is thrown vertically upwards from the ground level with a velocity of $40ms^{-1}$. The total time taken by the ball to return to the ground is
   A. 80seconds B. 4 seconds C. 8 seconds D. 400 seconds

12. White light is separated into component colors by a prism due to;

A. Refraction B. reflection C. diffraction D. interference

13. Which one of the following sets includes only vector quantities;

A. Mass, velocity, speed. B. Energy, electric field, momentum.

C. Weight, displacement, acceleration. D. Specific heat capacity, power, time.

14. The refractive index of glass is 1.5. the angle of refraction in glass for a ray of light incident at 30^0 is;

A. 19.5^0 B. 42.0^0 C. 45.00 D. 48.0^0

15. Which of the following light combinations will give white light?

A. Cyan + blue and magenta + red B. Cyan + red and magenta + green

C. Yellow + red and magenta + blue D. Cyan + green and yellow + blue

16. When a stone is projected up it has

A. Zero potential energy when it is moving

B. Maximum kinetic energy when at the highest position

C. Maximum potential energy when at rest on the ground.

D. Maximum potential energy at the highest point of its flight.

17. A little crystal of copper sulphate was carefully put at the bottom of a beaker containing water in a few days, all the water had a uniform bluish colour. The process by which this occurs is;

A. Convection B. Osmosis C. Diffusion D. Dispersion

18. In a hydraulic press, the area of the piston on which the effort is applied is made Smaller in order to:

A: facilitate the movement of the piston downwards

B: transmit a force as large as possible to the load

C: transmit pressure equally throughout the liquid

D: obtain a pressure as large as possible.

19. A rectangular block of mass 48kg measures 4m x 3m x 2m. What is the least pressure it can exert on a given horizontal surface?

A: 20Pa B: 40Pa C: 60Pa D; 80Pa

20. A car travelling at $20ms^{-1}$ is brought to rest in 10 seconds. Find the distance it travels in that time.

A: 100m B: 200m C: 300m D: 400m

SECTION B

21. (a) Define the term *Momentum*. (01 mark)

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(b) A bullet of mass 100g is fired with a velocity of 700 ms^{-1} from a gun of a mass 5kg. Calculate;

(i) The recoil velocity. (02 marks)

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(ii) Change in kinetic energy of the gun. (02 marks)

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22. (a) What is meant by refractive index of a medium? (01 mark)

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(b) (i) Draw a ray diagram for a ray of light traveling from glass to air at angle of incidence of 35^{o}. (02 marks)

(ii) Find the angle of refraction, (n_g=1.55). (02 marks)

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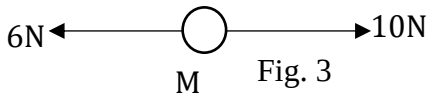

Fig. 3

Two forces of 6N and 10N act at the same time on a body M of mass 500g as shown in figure 3 above. Find the

(i) resultant force on M. (02 marks)

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(ii) acceleration of M. (03 marks)

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24. (a)(i) State the principle of **conservation of linear momentum**. (01 mark)

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(ii) What is **inertia**? (01mark)

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(b) A trolley of mass 0.1 kg moves horizontally with a velocity of 3 ms^{-1}. A body of mass 0.5 kg is dropped vertically at a speed of 2 ms^{-1} on to the trolley where it strikes the trolley. Calculate the final velocity of the trolley after the body is dropped. (3 marks)

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25. (a) Define the following terms

(i) Mechanical advantage. (01 mark)

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(ii) Mechanical advantage. (01 marks)

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(b) (i). Give one reason why the efficiency of the machine is always less than 100% (01 mark)

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(ii). Give two ways in which the efficiency of the machine can be increased. (02 marks)

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26. (a)(i). Define the term pressure and state its SI units. (02 marks)

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(ii). Name any two factors on the pressure in liquids depend . (01 mark)

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(b). A diver dives to a depth of 20 m below the surface of water of density 1×10^3 kgm^{-3}. Calculate the increase in pressure. (02 marks)

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"Merry Christmas and a prosperous 2020"