

SOUTHERN PROVINCE

GISAGARA DISTRICT

GS STPHILIPPE NERI GISAGARA

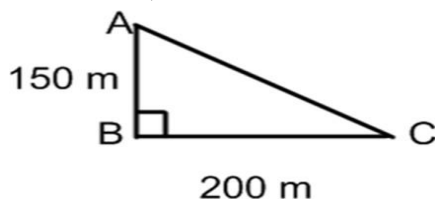
CLASS : S₁ ALL

**HOLIDAY PACKAGE OF SECOND
TERM**

SECTION A: ANSWER ALL QUESTIONS

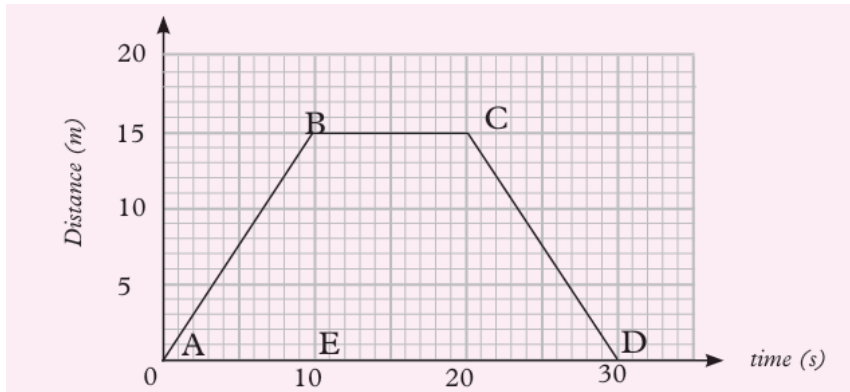
/55Marks

1. The three fundamental physical quantities are : **/1mark**
 - A. density, mass and time
 - B. length, time and mass
 - C. length, time and weight
 - D. volume, temperature and weight
2. Name the instruments you would use to measure each of the following : **/2marks**
 - (a) The length of a football field.
 - (b) The height of a 20 litre jerrican.
3. Consider the figure below (AB = 150 m, BC = 200 m)



- i. The total distance from point A to point C **/2marks** is.
 - a) 50 m
 - b) 350 m
 - c) 500 m
 - d) 250 m
- ii. Total displacement from point A to point C is: **/2mark**
 - a. 50m
 - b. 350m
 - c. 500 m
 - d. 250 m

4. The Figure below shows a distance-time graph for a motorist. Study it and answer the questions that follow.



- a) The motion of the motorist in regions AB is: **/1mark**
- i) Body at rest.
 - ii) Uniform Deceleration.
 - iii) Uniform acceleration

- iv) Uniform Linear Motion.
- b) The motion of the motorist in regions BC is: **/1mark**
- Body at rest.
 - Uniform Deceleration.
 - Uniform acceleration
 - Uniform Linear Motion.
- 5.
- a) Which one does not explain the concept of force? **/1mark**
- Direction
 - Magnitude
 - Both push and pull
 - Kilogram
- b) The resultant of the following sets of forces: **/3marks**
- A force of 35 N backwards and a force of 35 N forward.
a) 0N b) 70 N c) 35 N d) 45 N
 - A force of 120 N upwards and a weight of 150 N.
a) 30 N b) 270 N c) 100 N d) 200N
 - A force of 29 N upward, a force of 34 N upward, and a force of 50 N downwards.
a) 13 N b) 63N c) 113 N d) 5 N
6. A truck of mass 2.5 tones accelerates at 7.5 m/s^2 . Calculate the force generated by the truck's engine to attain this acceleration. If the road is so smooth. **/2.5 marks**
-
-
7. Draw a free-body diagram on which a rightward force is applied to a book of 2 kg of mass in order to move it across a desk with a rightward acceleration. Consider frictional forces. Neglect air resistance, show all other forces exerted on it. **/4marks**
-
-
-
-
8. a) Differentiate the Centre of mass and Centre of gravity. **/2marks**
-
-
- b) Answer by True or False **/5marks**
- The Centre of gravity of a body is the point through which the entire weight of the body appears to act.
 - The Centre of gravity of an irregular shaped object can be determined using the method of suspension.
 - Lowering the Centre of gravity increases the stability of an object.

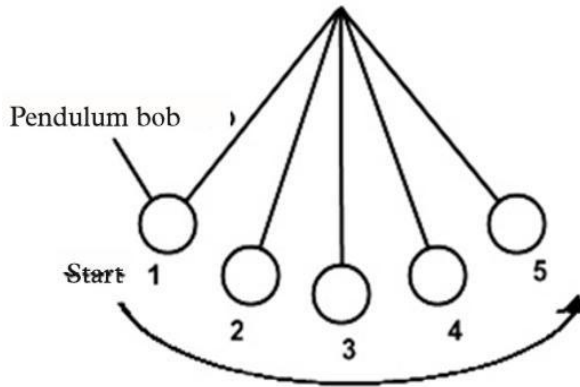
- iv. A tall object is always more stable than a short object of the same base area.
- v. The Centre of gravity must always lie inside the material of a body.

9.

a) State the law of conservation of energy. /2marks

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b. A pendulum bob swings as shown in the diagram

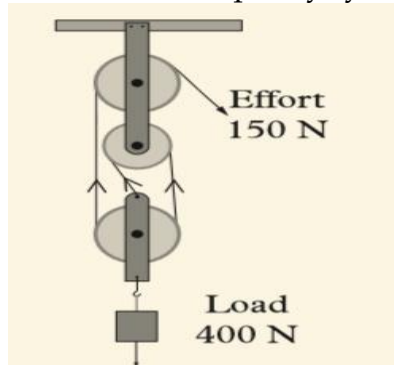


At which position (s) is:

- (i) The kinetic energy of the pendulum bob least.
- (ii) The potential energy of the pendulum bob most.
- (iii) The kinetic energy of the pendulum bob the most.....
- (iv) The potential energy of the pendulum bob the least.

(/4marks)

10. The Figure below shows a pulley system.



a. What is the velocity ratio of the system? /1mark

.....

b. Calculate the Mechanical Advantages /1mark

.....

c. Calculate the efficiency of the system. /2marks

.....

11. Discuss the importance of simple machines in our daily life. Support your argument with examples. /4marks

12.

- a) Copy and complete the table below by writing Yes where is correct. /3.5 marks

Physical property	Solids	Liquids	Gases
Can flow			
Definite Volume			
Can expand to fill available space			
Definite shape			
Can be compressed easily			

- b) Name these changes of state:

/2 marks

- From liquid to a solid
- From gas to solid
- From solid to liquid
- From a liquid to a gas.....

13. I) differentiate between heat and temperature.

/2marks

- II) Convert each of the following into degrees Celsius. /3marks

- (a) 314 K =..... (b) -6 K=..... (c) 273 K=.....

- III) What are the advantages of alcohol thermometer over mercury thermometer? /2marks

14. Explain why it is easier to compress a gas than a liquid or a solid? /2marks

SECTION B: DO ALL QUESTIONS /50 Marks

15. a) Define the term power and give its SI unit. /2marks

b) A fork-lift truck raises a 400 kg box through a height of 2.3 m. The case is then moved horizontally by the truck at 3.0 m/s onto the loading platform of a lorry.

- What minimum upward force should the truck exert on the box? /2marks
- How much P.E. is gained by the box? /2marks
- Calculate the K.E of the box while being moved horizontally. /2marks
- What happens to the K.E once the truck stops? /2marks

16. a) Explain the term inertia.

/2marks

b) State three practical applications of inertia law. /3marks

c) Determine the force of gravitational attraction between a student of mass 60 kg and the earth if the student is standing on the earth surface a distance of 6.4×10^6 m from the Centre of the earth. (Mass of the earth = 5.98×10^{24} kg, $G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$) /5marks

17. a) Differences between mass and weight /4marks

No	Mass	Weight
1		
2		
3		
4		

b) A van of mass 2500 kg is authorized to carry 14 passengers. If the average mass per passenger is 50 kg, calculate the:

(i) Weight of the van. /2marks

(ii) Weight of all passengers. /2marks

(c) total weight of the van and the passengers /2marks

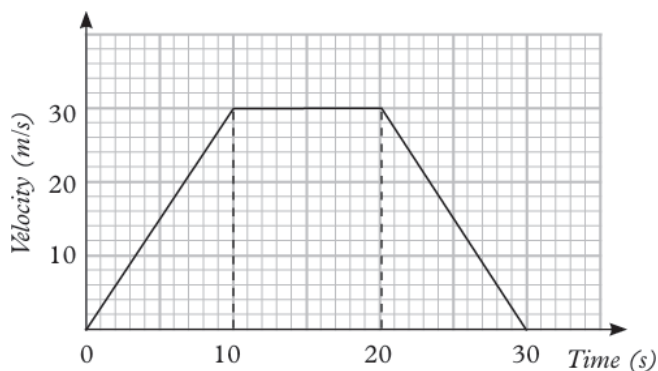
18.

I) A car accelerates from rest to a velocity of 20 m/s in 5 s. Thereafter, it decelerates to a rest in 8 s. Calculate the acceleration of the car

(a) in the first 5 s, (2marks)

(b) in the next 8 s. (2marks)

II) Figure below shows the velocity-time graph of a car.



Use the graph to find

(a) acceleration of the car. **(2marks)**

.....

(b) deceleration of the car. **(2marks)**

.....

(c) total displacement of the car. **(2marks)**

.....

19. a) State three (3) states of equilibrium. **(3marks)**

b) With aid of a diagram, describe how you can determine the Centre of gravity of an irregular plane sheet of metal. **(5marks)**

SECTION C: 15Marks

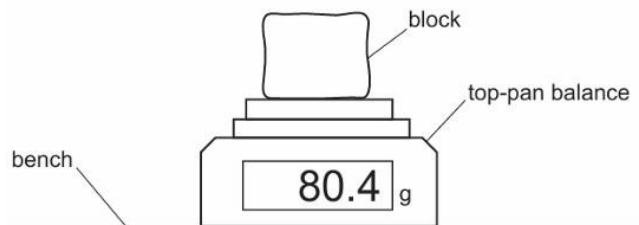
20. A student need to determine the density of irregular modelling clay.

a. What are measuring instruments that can be used to measure: **/2marks**

i. Mass of the modelling clay.

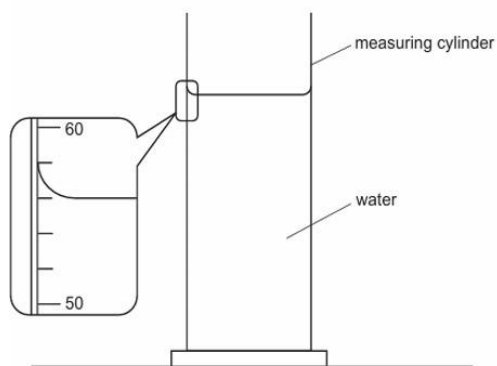
ii. Volume of modelling clay

b. He Record the mass of the block shown on the top-pan balance in figure below. Include the unit for mass.

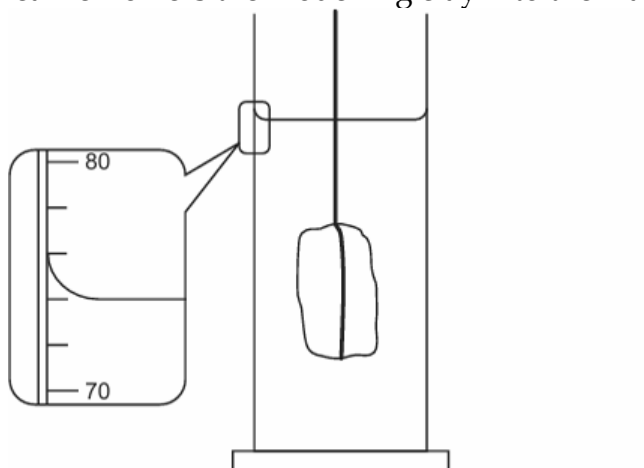


Record the mass of the Modelling clay $m_A = \dots\dots\dots$ **/1mark**

c. The learner pours water into a measuring cylinder and Record the volume V_1 of the water in the measuring cylinder as shown in figure below.



- Record the volume of water in measuring cylinder..... $V_1 =$ **1mark**
- d. The learner lowers the modelling clay into the water as shown in figure below



- Record the new volume. $V_2 = \dots\dots\dots$ /**1mark**
- e.
- i. What is the volume of the modelling clay? /**3marks**
.....
.....
 - ii. Determine the density of modelling clay. /**4marks**
.....
.....
.....
- f. Is there any other method that can be used to determine volume of irregular object?