SOUTHERN PROVINCE

NYANZA DISTRICT

SENIOR ONE

SECOND TERM

INSTRUCTIONS

This paper has two sections A and B

Answer all questions from section A and three questions from section B of your choice.

PHYSICS COMPREHENSIVE ASSESSMENT (100marks)

SECTION A (70marks)

Q1. Answer by true (T) or false (F) for the following statements **(5marks)**

i) The volume of liquid is measured by using a beam balance.

ii) A rectangular shaped garden of measures 20 m by 40 m, its area is 1000 m^2

iii) Area is an example of fundamental physical quantity.

iv)The S I unit of mass is Kg.

v) Learners should follow the instructions of teacher during laboratory work.

Q2. Choose the letter that corresponds to the correct answer **(5marks)**

i. Magnetic force is:

a) contact force b) non-contact force c) friction force d) power

ii. …….Is an example of natural science:

a) Mathematics b) History c) Physics d) Biology

iii. The followings are fundamental physical quantities except:

a) Time b) Mass c) Acceleration d) length

iv. The volume of liquid is measured by using:

a) Beam balance b) Measuring cylinder c) Densimeter

v. A rectangular shaped garden measures 20m by 40m its area is:

a) 800dm^2 b) 800m c) 800cm^2 d) 800m^2

Q3.a) Which instrument would you use to measure accurately very small length as diameter of thin wire? **(1mark)**

b) What does a measuring cylinder as an instrument of measurement is used for? **(2marks)**

Q4. a) Explain why speed is a scalar quantity while velocity is a vector quantity. **(2marks)**

b) Give one other example of a vector quantity. **(1mark)**

Q5.a) A liquid has no definite shape. Why? **(1mark)**

b) Explain why the volume of air changes without changing its mass. **(2marks)**

Q6.a) A force of 100N is used to push a wheel barrow 300m away. Calculate the work done by the force. **(4marks)**

b) An electric motor is used to raise a load of 80N in a vertical height of 2.5m in 4s. Calculate the power of the motor. **(4marks)**

Q7.a) Define the term inertia. **(2marks)**

b) Identify Newton's law of motion associated with the following statements**:**

(i) A boat moves forward as water is pushed backward**. (1mark)**

(ii) Passengers in moving car tend to continue moving forward as the car stops accidently. **(1mark)**

Q8. (a) What is force? **(2marks)**

(b) Name any 2 types of forces. **(2marks)**

Q9. Draw a cone:

(a)In a stable equilibrium,

(b)In unstable equilibrium

(b)In a neutral equilibrium. **(6marks)**

Q10.a) List energy changes which occur when a torch containing cells is switched on. **(2marks)**

c) Which are other sources of electricity rather than hydroelectric power in Rwanda? **(3marks)**

Q11. a) Study the graph below and identify the type of motion illustrated. **(1mark)**

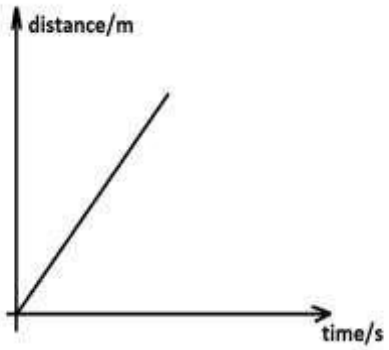


Fig.1

(b)A car changes its speed from 20m/s to 30m/s in the 5 seconds.
What is its acceleration? **(4marks**)

Q12.Matcheachof the following physical quantity with its meaning (**5marks)**

Physical quantity	Meaning
1.Power	a) The capacity for doing work
2.Energy	b) Any interaction that can change the motion of an object
3.Work	c) The rate at which work is done
4.Potentialenergy	d) Energy transfer that occurs when an object is moved over a distance by a force applied in the direction of the displacement
5.Force	e) Energy possessed by an object because of its position

Q13. a) The accompanying diagram represents a screw gauge. The circular scale is divided into50 divisions and the linear scale is divided into millimeters. If the screw advances by 1 mm when the circular scale makes 2 complete revolutions, find the least count of the instrument and the reading of the instrument in figure below.**(2 marks)**

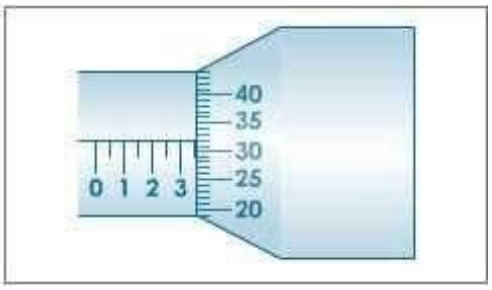


Fig.2

b. Write down the reading on this vernier caliper. **(2marks)**

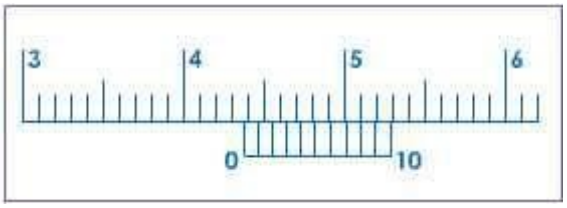


Fig.3

Q14. Copy and complete the table below by writing YES or NO in the empty space. **(6marks)**

Physical property	**Solids**	**Liquids**	**Gases**
Can flow			
Definite volume			
Definite shape			
Can be compressed easily			

Q15. a) What is a transducer?(2marks)

b) Name the transducers which convert the following forms of energy:

(i) electrical energy into sound energy(1mark)

(ii) electrical energy into heat energy(1mark)

(iii) solar energy into electrical energy (1mark)

SECTION B

Q16. a) What meant by the term physical quantity (2Marks)

b) Complete the following table (4 Marks)

Physical quantity	***SI unit***	***Instrument used***
.....	Kg/m3	Densimeter
Volume	.....	.....
.....	.....	Stop watch
Temperature	Kelvin	.....
Length	.....	.....

c) From the following list of physical quantity," Mass, Area, volume, Time, Temperature, Force, Intensity of current and acceleration, identify the : (3Marks)

i) fundamental physical quantity

ii) Derived physical quantity

Q17. a) What are the characteristics of force as vector quantity?

(2 marks)

b) Copy and complete the following table using the terms **contact**

forces or non-contact forces

Forces	Types of forces
Friction force	
Magnetic force	
Tension force	
Gravitational force	

(4 marks)

c) Two people are pushing a disabled car. One exerts a force of 200 N east, the other exerts a force of 150 N west.

(i)What is the net force exerted on the car? **(2 marks)**

(ii)Determine the direction of the net force **(2mark)**

Q18.a) Define a simple machine. **(2marks)**

b) The diagram below shows a lever system. Calculate the minimum effort to move the mass of 100kg.**(3mark)**

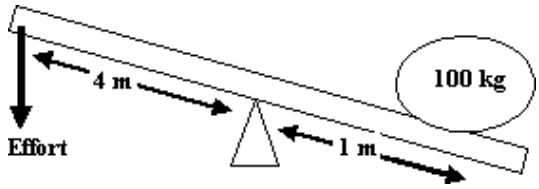


Fig.4

c. (i) In the pulley system below, an effort of 60N lifts a load of 90N through a vertical distance of 4 cm. Calculate the efficiency of the system if the effort moves 8cm**.(3marks)**

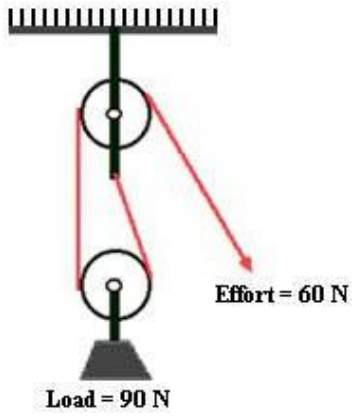


Fig.5

ii) Give two reasons why the efficiency in the pulley system is less than 100%. **(2marks)**

Q19.a) Describe an experiment to find the center of mass of an irregular lamina like the diagram below.**(3 marks)**



Fig.6

b) Copy and label with a dot the center of gravity of each of the following objects (Fig.7).Use the diagram to show how this centre of mass is obtained.**(4marks)**

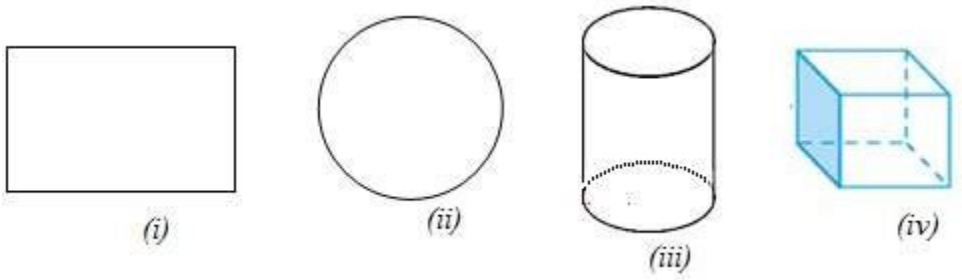


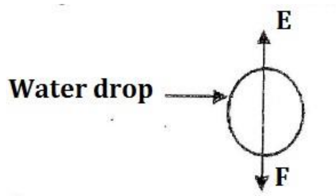
Fig. 7

(i)Rectangular lamina, (ii)Circular object,(iii)Cylindrical object, (iv)Rectangular parallepiped object

c) Use the terms unstable equilibrium, stable equilibrium, and neutral equilibrium to complete the following statements. Respect the order of the question when answering it and don't copy the entire statement

i) Occur when a simple object is placed in such a position that any slight Disturbance would not change the level of its center of gravity. **(1 mark)**
ii) Occur when a simple object is placed in such a position that any slight Disturbance effort would raise its center of gravity. **(1 mark)**
iii) Occur when a simple object is placed in such a position that any slight Disturbance effort would lower of its center of gravity. **(1 mark)**

Q20. The figure below shows forces E and F acting on a falling drop of water to the ground.



a)Name force

i) E **(1.5marks)**

ii) F **(1.5marks)**

b) State what causes force E **(1mark)**

c) What would happen to the drop of water if forces E and F are equal.**(2marks)**

d) Explain how the weight of an object varies with the altitude. **(2marks)**

e) An object has mass and weight. Which of the two quantities:

(i) remains constant every where? **(1mark)**

(ii) changes with position? (**1mark)**

HAPPY EASTER DAY !!