R&PUBL IC OF SOMALILAND

FORM FOUR EXAMS, 2021

PHYSICS

2021

NATIONAL EXAMINATION BOARD

SomExams

OK

Total Score

Name: .....

School: .....

Roll No: .....

Republic of Somaliland

Somaliland National Examination and Certification Board

Form Four

Physics Examination

2020/2021

TIME: 2 HOURS

Plus 10 minutes for reading through the paper

INSTRUCTIONS TO CANDIDATES:

This paper consists of **11** printed pages with the cover page.
Count them now. Inform the invigilator if there are any missing or extra pages.

There are two parts:

PART ONE:	**Multiple Choice Question**	**(40 marks)**
PART TWO:	**Structured Questions**	**(60 marks)**
	TOTAL	**(100 marks)**

Answer ALL questions

No extra papers is allowed

Use this page for rough work. It will NOT be marked.

PART ONE Multiple Choice Questions (40 marks)

1. 50ml is the same as;
   a. 0.05 L
   b. 0.5 L
   c. 5 L
   d. 50 L

2. Which of the following is an example of renewable energy resource
   a. Coal
   b. Solar
   c. Natural gas
   d. Oil

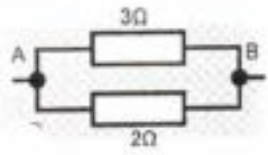
3. Iron is used for the core of electromagnets. This is because iron
   a. Is a good electrical conductor
   b. Magnetizes and demagnetizes easily
   c. Is hard magnetic material
   d. Is a metal

4. The figure shows the electric field between two bar magnets.

   Which row A to D correctly shows the polarity of X and Y
   a. X is north and Y is south
   b. X is south and Y is north
   c. X and Y are both north poles
   d. X and Y are both south poles

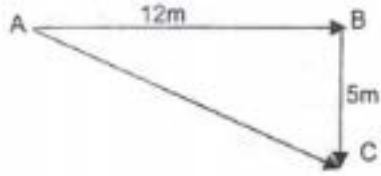
5. Unit of electric Current is Ampere (A) One ampere is the rate of
   a. One joule per coulomb (1J/C)
   b. One coulomb per second (1 C/s)
   c. One Joule per second (1 J/s)
   d. One Coulomb per volt (1 C/v)

6. What is the combined resistance R_T across A and B



a. 1.2 Ω
b. 2.4 Ω
c. 3.6 Ω
d. 5.0 Ω

7. An object travels 12m from A to B and then 5m from B to C. What is the final displacement?



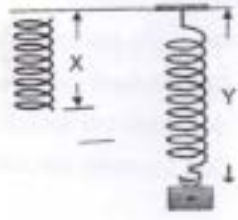
a. 5m
b. 7m
c. 12m
d. 13m

8. If a car stops suddenly, passengers fall forwards. This is an example of Newton's
   a. First law of motion
   b. Second law of motion
   c. Third law of motion
   d. Law universal gravitation

9. The figure shows the forces acting on a stone falling freely from a certain height. What are the forces X and Y stand for

   a. Friction and air-resistance
   b. Weight and friction
   c. Air-resistance and weight
   d. Weight and tension.

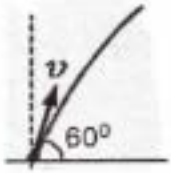
10. A spring is X cm long. When a load is hung from the spring, it stretches to Y cm. What is the extension



   a. X – Y
   b. Y – X
   c. X + Y
   d. Y

11. The quantity that tells how hard a force acts (Ft) is known as:-
    a. Moment
    b. Momentum
    c. Impulse
    d. Inertia

12. A ball is kicked making an angle of 60^0 with a velocity of 30 m/s. What is the horizontal component of the initial velocity



    a. 12 m/s
    b. 15 m/s
    c. 26 m/s
    d. 30 m/s

13. The amplitude of a wave decreases as the
    a. Energy of wave increases
    b. Energy of wave decreases
    c. Energy of wave increases or decreases
    d. Energy of wave becomes the same

14. A student stands 660m from a wall and bangs his hands together to hear the echo. If the speed of sound is 330 m/s, the time taken is:
    a. 4 seconds
    b. 4.5 Seconds
    c. 5 seconds
    d. 5.5 seconds

15. Gamma radiation is not deflected by an electric and magnetic fields because
    a. Has positive charge
    b. Is made of electrons
    c. Has no charge
    d. Has the most ionizing effect

16. In the nuclear equation $^{4}_{2}He + {}^{x}_{13}Al \rightarrow {}^{30}_{15}P + {}^{1}_{0}n$

what is the value of X?

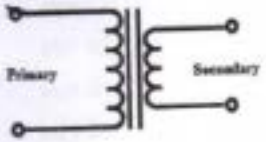
a. 15

b. 27

c. 37

d. 35

17. The figure shows a step-down transformer. A transformer is a device used to



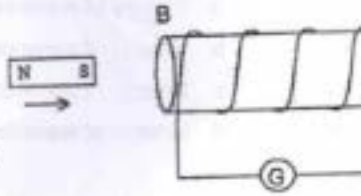
a. Change AC to DC

b. Change a voltage from one value to another

c. Change electric power from one value to another

d. Change DC to AC

18. The figure below shows a magnet being pushed into a coil of wire which of the following statement is correct



a. The induced current will flow from B to A

b. End B will become a south pole.

c. The induced current will move from A to B

d. The effect is called motor effect.

19. In radio receiver, the process of separating AF from RF is known as

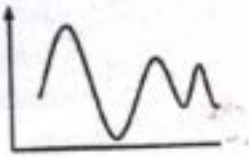
a. Encoding

b. Modulating

c. Demodulating

d. Mixing

20. The symbols shown in the figure represents



a. Analog signal

b. Digital signal

c. Resonance circuit

d. Tuning circuit

Part Two: Structured Questions **(60 marks)**

1. a) Define density and write down its formula (2 marks)

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.....

.....

b) Use the formula to calculate the density of a body of mass 60g which has a volume of $5cm^3$ (2 marks)

.....

.....

.....

c) Density of water is $1g/cm^3$. Calculate the mass 12 cm^3 of water (2 marks)

.....

.....

.....

2. In vacuum flask, what process of heat transfer is reduced by

a) The vacuum layer between the glasses? (2 marks)

.....

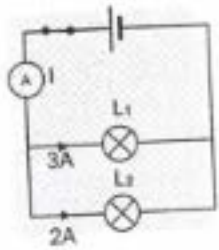
b) The shiny silver coated inside the walls? (2 marks)

.....

c) The insulator stopper (cover)? (2 marks)

.....

3. In the circuit shown in the figure, two lamps are connected across a power supply



a) The two lamps are connected in (tick one box)

Series ☐

Parallel ☐ (2 marks)

b) How can you tell from the diagram that L_1 has less resistance than L_2

.....

..... (2 marks)

c) What will happen to L_2 if L_1 blows out? (2 marks)

.....

.....

.....

4. A rocket of mass 500kg is fired upwards.

a) What is the weight of the rocket?($g=10m/s^2$) (2 marks)

.....

.....

.....

.....

b) If the engine exerts a force (trust) of 8000N, work out:

i) The net force on the rocket (2 marks)

.....

.....

.....

ii) Initial acceleration (2 marks)

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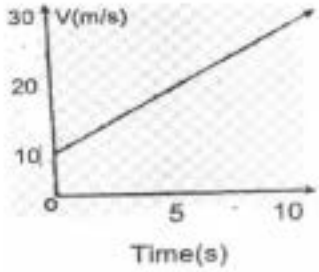
5. The figure shows a velocity- time graph



a) How can you tell from the graph that
The body is speeding up (2 marks)

.....

.....

.....

b) The slope or gradient of the line stands for (2 marks)

Distance travelled ☐

Acceleration ☐

c) From the graph, find out the acceleration (2 marks)

.....

.....

6. When the load shown in the figures is hang from the spring, it stretches

a) The spring is an elastic material. What is meant by elastic material (2 marks)

.....

.....

.....

b) The elastic property is explained by Hooke's law, F= kx. What does the letter k stands for? (2 marks)

.....

c) In the load-extension graph, what does the point marked E represent? (2 marks)

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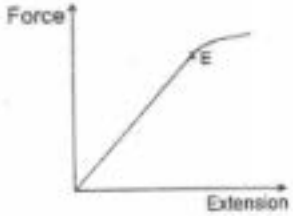
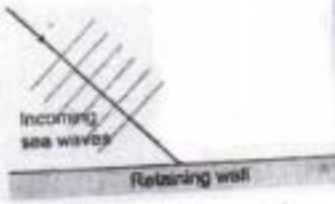


7. In the figure straight water waves strike a plane barrier and they bounce back



a) What is this property of waves called? (2 marks)

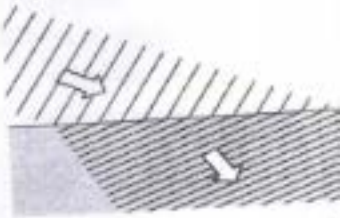
.....

b) On the diagram, draw the trace of the waves after bouncing back (2 marks)

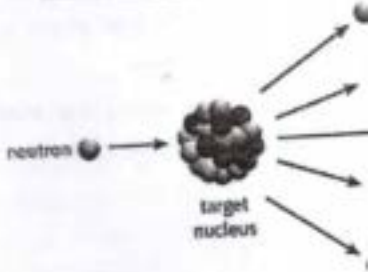
.....

c) In this case, the waves enter a new medium and change its direction. What is this property of waves called? (2 marks)

.....



8. The figure shows a neutron striking uranium atom



a) The reaction shown in the figure shown stands for

Nuclear fission ☐

Nuclear fusion ☐ (1 mark)

b) ${}^{235}_{92}U + {}^{1}_{0}n \rightarrow {}^{x}_{39}Z + {}^{160}_{Y}Sn + 4({}^{1}_{0}n)$. Work out the value of X and Y (3 marks)

.....

.....

.....

c) Write down any two positive uses of radioactivity (2 marks)

1. _____

2. _____

9. The figure shows a radio receiver. Match the parts of the radio in A and their functions in B (6 marks)

A	B
a) Aerial _____	1. Selects one particular frequency
b) Tuning circuit_____	2. Increasing the energy of the signals
c) Amplifier_____	3. Detects signals

10. In the figure, a wire 20cm long is moved downwards across a magnetic field of strengths 1. 2T at 3m/s

a) Use FRHR to show the direction of the induced current.

Use ⊗ for in to the page

⊙ Out of the page (2 marks)

b) The effect is called (2 marks)

Transformer effect ☐

Generator effect ☐

b) Work out the size of the Emf. induced in the wire (2 marks)

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END