R&PUBL IC OF SOMALILAND

FORM FOUR EXAMS, 2019

PHYSICS

2019

NATIONAL EXAMINATION BOARD

SomExams

Total Score

Name .....

School .....

Roll No .....

Republic of Somaliland

Somaliland National Examination Board

Form Four

PHYSICS

EXAMINATION

JUNE 2019

TIME 2 HOURS

Plus 10 minutes for reading through the paper

INSTRUCTIONS TO CANDIDATES

This paper consists of 13 printed pages.
Count them now. Inform the invigilator ff there are any pages missing.

PART 1;	**20 Multiple Choice Questions**	**40 Marks**
PART 2:	**7 Structured Questions**	**60 Marks**

TOTAL 100 Marks

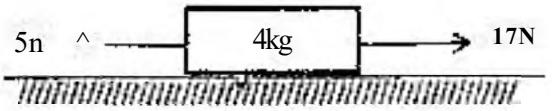
- **Answer ALL questions fn Part 1 and 1.**
- **No extra papers are allowed.**

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

PART ONE: 20 *x 2* = 40 marks

Multiple choices (for each question in this section circle the letter or the correct answer)

\. A force of 17 N acts on a block of **mass 4kg.** The force of friction opposing the motion is 5N. die acceleration of the block Is



a. $2m/s^2$

b. $3m/s^J$

c. $4m/s^1$

d. $12m/s^2$

2. The gradient of velocity -time graph represents

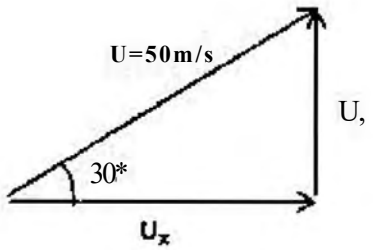
a. acceleration of the motion

b. displacement made

c. total d istance travel led

d. direction of the motion.

3. A projectile is thrown at an angle of 30^s to the horizontal with an initial velocity of 50 m/s. The vertical component of initial velocity is



a. 20 m/s

b. 25 m/s

c. 43.3 m/s

d. SO **m**/s

4, Asha runs up a flight of stairs as in the figure. What will happen to his gravitational potential energy (GPE)

a. Increases

b. Decrease

c. Increases first and then decreases

d, Remains unchanged

5. What property of waves is ilJustrated by the diagram?

a. reflection
b. refraction
c. diffraction
d. interference

6. Which of the following properties belongs to sound waves? Sound waves
   a. are transverse waves
   b. can travel through vacuum
   c. need medium for travel
   d. are electromagnetic waves.

7. In radio reception system, the process of removing radio frequency (r.f) carrier from audio frequency (a.f) signals is known
   a. Modulation
   b. Demodulation
   c. Encoding
   d. Transmission

8. The graphs in the figure stands for

   a. digital signal
   b. analogue signal
   c. sine wave
   d. modulated signal

9. In the nuclear reaction \H + $Li * ViHe)
   The value of X is:
   a. 2
   b. 4
   c. 7
   d. 8

J 0, A radioactive nuclide has a half-life of 4 days, What fraction of the original number of atoms will remain after 12 days?

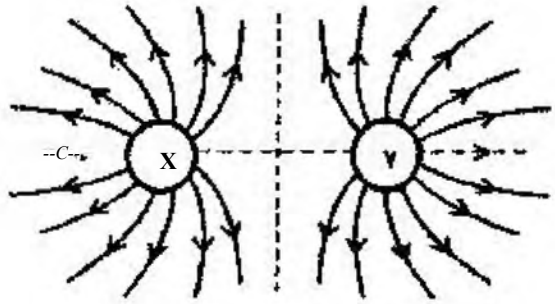
a. $\frac{i}{r_2}$

b- $\frac{1}{4}$

c. $\frac{1}{8}$

◁ $\frac{1}{16}$

11. In the figure, two point charges X and Y are brought close together. Which row A to D correctly shows the sign of the charges?



a- X is positive and Y is negative

b. *X* is negative and Y is positive

c> X and Y are both positive

d. X and Y ore both negative.

12. In vacuum flask which process of heat transfer is reduced by the vacuum iayer between die double glasses?

a. Conduction

b. Convection

c. Radiation

d. Evaporation

13. Water is used to cool machines. This is because water:

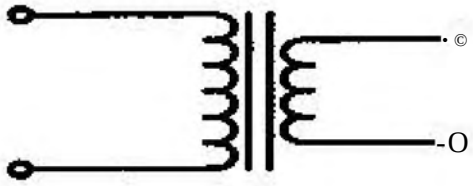
a. is easily available

b. is a liquid

c. has high specific heat capacity

d. has unusual expansion.

14. The circuit show below st&itds for :-

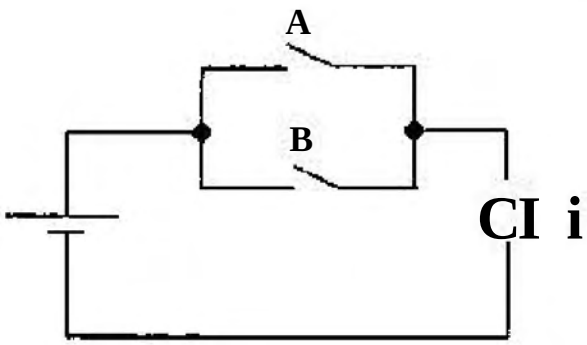


a, trails! stor
b, rectifier
c. transformer
d. amplifier

15. A microphone converts sound (mechanical) energy to electrical signal. This is art example of:
a. motor
b. generator
c. rectifier
d. galvanometer

16. A bulb is labeled with "100 watts" , which information does the label give about the iafTipi-
a. ensqjy it dissipates m 'jriiRirae
b, current it lets through
£ resistance it offers to current
d, voitojge across the lanip

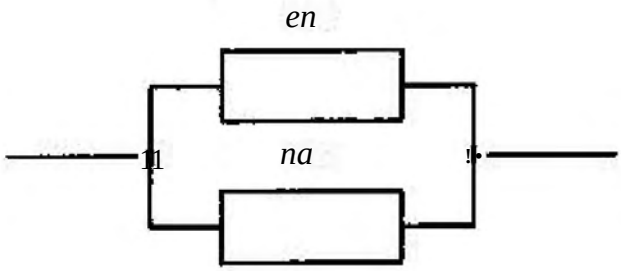
17. The logic gate whose switching circuit is shown in the figure stands foe-
a. AND gate
b. OR gate
c, NOT gate
d, NAND gate



18, Two resistors are connected is parallel els shown in the figure.

Total (aqusvaieni) resistance of the circuit JS

a. 4 £1
b. 6 a
c. 12 a
d. ik a



19. How does resistivdy of semiconductor depend on temperature changes? Reslsti vity:-

fl, decreases as temperature risss
b. Ureases as temperature rises
c. increases first and then decrease
d. does not change with temperature

20, Speed at light in vacuum is 3 x 10^{s} m/s and speed ofligbt in water is 2.25 x 10^{*} m/s, calculate the index of refraction of water

a. 0,75
fe. 1,24
I 1,33
d. J.5

PART TWO: Structured Questions

]. a. the law of conservation of linear momentum can be written mathematically as follows

mi U| + m_3U2 ≈ m t VL + miU2

Describe the taw in words

.....

.....

..... (2 marks)

b. Two cars of masses 1200kg and 800kg moving towards each other at 20 m/s and 30 m/s respectively collide. If the two cars stick together and move in the same direction calculate their common velocity

.....

.....

.....

.....

.....

..... (3 marts)

c, the quantity that tells how hard a force acts is given by Ft This quantity is known as

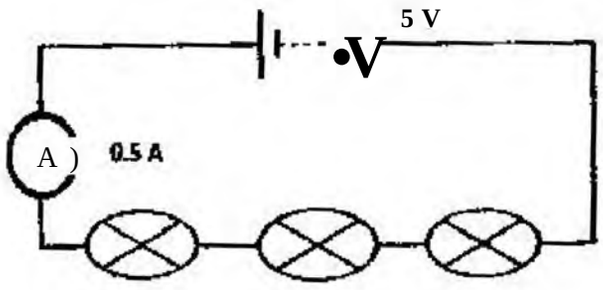
moment ☐

momentum ☐

impulse ☐ tick one box (j)

(2 marks)

2- Three lamps are arranged in series, as in the figure, across 6v power supply and a current of 0.5A flows through the lamps



a. Describe two disadvantages of series arrangement of lamps

.....

.....

..... (2 marks)

v

b. Voltage across a circuit is proportional to the current (y = R).

This rule is known as

.....

(2 marks)

c. Use the rule to calculate total resistance of the lamps

.....

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.....

.....

(2 marks)

d. Given that all the three lamps are identical, calculate the resistance of each lamp

.....

.....

.....

(2 marks)

3. a. The quantity of heat supplied by **a** heater of power P in a period of time is given by

Q = P t

i. Use the equation to calculate the quantity of heat supplied by a heater of power 500 wetts in 5 minutes

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.....

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(3marks)

ii. Unit of power is watt. Express watt in an equivalent unit

.....

.....

(2 marks)

b. Explain in brief, how a human body cools down itself by sweating

.....

.....

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{2 marks)

4. a) Most of the mass of an atom is contained in the nucleus. What particles are available in the nucleus?

(2 marks)

b) the figure illustrates the effect of electric field on nuclear radiations. Write down the name of radiation represented by;

X _____

Y _____

Z _____

(3 mute)

c) Why radiation Y is not deflected (passes straight)?

.....

.....

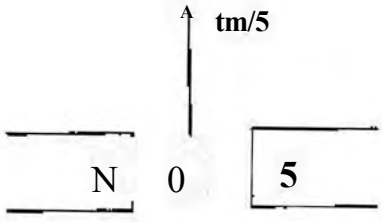
..... (2 marks)

d) Give any two positive applications of radioactivity

1 _____

2 _____ **(2 marks)**

5. A wire 20cm long is moved upwards at a speed of 8m/s at right angles to a magnetic field of strength 2.5 T. The field goes from North - to South.



a) Calculate the size of the Ernf induced in the wire

.....

.....

.....

.....

..... (3 marks)

b) On the diagram illustrate the direction of the induced current.

Use (^ 1 **for into the page**

: • i **for out of the page** (2 marks)

c) Suggest two ways of increasing the size of the induced Emf.

.....

.....

..... (2 marks)

d) The arrangement produces electricity from motion. This is an example of

Motor ☐

Generator ☐

Transformer ☐ (2 marks)

6, Sound is a form of energy produced by vibrating body

a) Sound consists of compressions and rarefactions. Because of this property sound is

longitudinal wave ☐

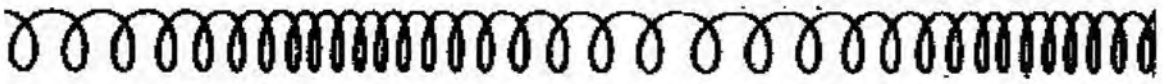
Transvers wave ☐ (2 marks)

b) Sound needs materia] medium for propogation. This shows that sound is

electromagnatic wave ☐

mechanical wave ☐ (3 marks)

c) Label C for compression and ft for rarefaction



(3 marks)

d) Ships use echo to detect the depth of water underneath, A ship sends sound pulses and receives an echo after 1.2 seconds. Calculate the depth of the sea, if speed of sound in water is ISOOmfs,

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(2 marks)

7. The figure shows a system of radio transmitter. Study it and then answer the following questions

Which of these parts of the transmitter (5 x 2 = 10 marks)

a) Products audio frequency (a.f) signals ? .....

b) Produces carrier frequency (r.f) signals?.....

c) Sends out radio waves? .....

d) Mixes a.f signals in to r.f carrier ?,.....

e) Increases the energy of modulated wave?..... .....

END