

R&PUBLIC OF SOMALILAND

FORM FOUR EXAMS, 2018

PHYSICS



NATIONAL EXAMINATION BOARD





Total Score

Name

School

Roll No

Republic of Somaliland

Somaliland National Examination Board

Form Four

PHYSICS EXAMINATION

JUNE 2018

TIME 2 HOURS

Plus 10 minutes for reading through the paper

INSTRUCTIONS TO CANDIDATES

This paper consists of 15 printed pages.
Count them now. Inform the invigilator if there are any pages missing.

PART 1: 20 Multiple Choice Questions 40 Marks

PART 2: 8 Structured Questions 60 Marks

TOTAL 100 Marks

- Answer ALL questions in Part 1 and 2.
- No extra papers are allowed.

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

Rough work area with horizontal dotted lines for writing.

PART 1: ANSWER ALL QUESTIONS IN THIS SECTION.
CIRCLE THE CORRECT ANSWER.

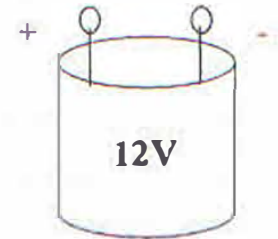
(40 Marks)

1. Ice is used for cooling drinks. This is because, ice:

- A. is a solid
- B. has less density than water
- C. takes in latent heat from the drink
- D. has white colour

2. The battery shown in the figure is labeled 12V. The label describes :

- A. power of the battery
- B. energy it can supply to coulomb of charge
- C. internal resistance of the battery
- D. the capacity of the battery



3. The figure shows the electric field between two point charges A and B.

Which row correctly shows the type of charge on each?

- A. A is positive and B is negative
- B. B is positive and A is negative
- C. A and B are both positive
- D. A and B are both negative

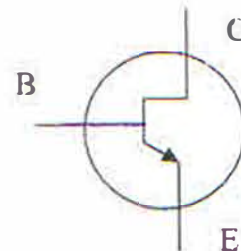


4. The electric current flowing through a conductor when 16c of charges passes through it, in 4 second , is :

- A. 0.25 A
- B. 2 A
- C. 4 A
- D. 64 A

5. The symbol shown in the figure stands for:

- A. diode
- B. resistor
- C. transistor
- D. transformer



6. Rainbow is caused by :

- A. reflection of light
- B. refraction of light
- C. diffusion of light
- D. diffraction of light

7. Which of the following electronic components is NOT correctly labeled :



8. A force of 20N acts on a block of mass 4kg on rough surface. If the force of friction opposing the motion is 8 N, what is the acceleration of the block?

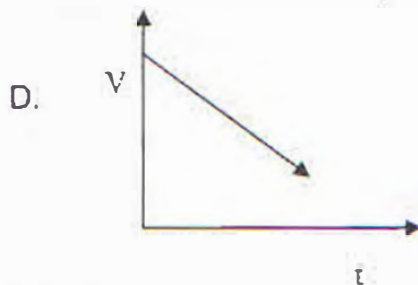
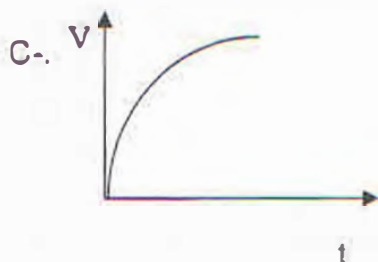
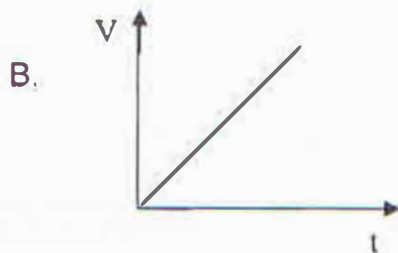
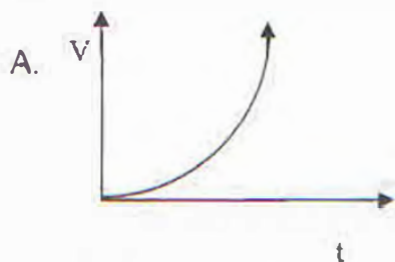
- A. 3 m/s^2
- B. 4 m/s^2
- C. 5 m/s^2
- D. 7 m/s^2

9. The forces acting on falling raindrop are shown in the diagram. What will happen to the motion of the drop when air-resistance R is balanced by the weight W?

- A. stop
- B. slow down
- C. speed up
- D. move at a constant speed.



10. Which of the following graphs correctly represent the velocity-time graph for uniform deceleration :



11. In swimming water is pushed backwards and as a result the swimmer moves 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 of inertia

12. A spring has spring constant K . If an other identical spring is connected in series, what is the spring constant of the combination?

- A. $\frac{k}{4}$
- B. $\frac{k}{2}$
- B. $2k$
- C. $4k$

13. Microwaves are used to carry electronic information via telecommunication satellites. This is because microwaves

- A. are electromagnetic waves
- B. are not absorbed by gas particles
- C. can travel at the speed of light
- D. can pass through ionosphere.

14. Process of adding RF carrier to audio signals to be transmitted is known as:

- A. decoding
- B. modulating
- C. demodulating
- D. translating.

15. In the symbol ${}_{92}^{235}\text{U}$, the numbers 92 and 235 respectively stand for :

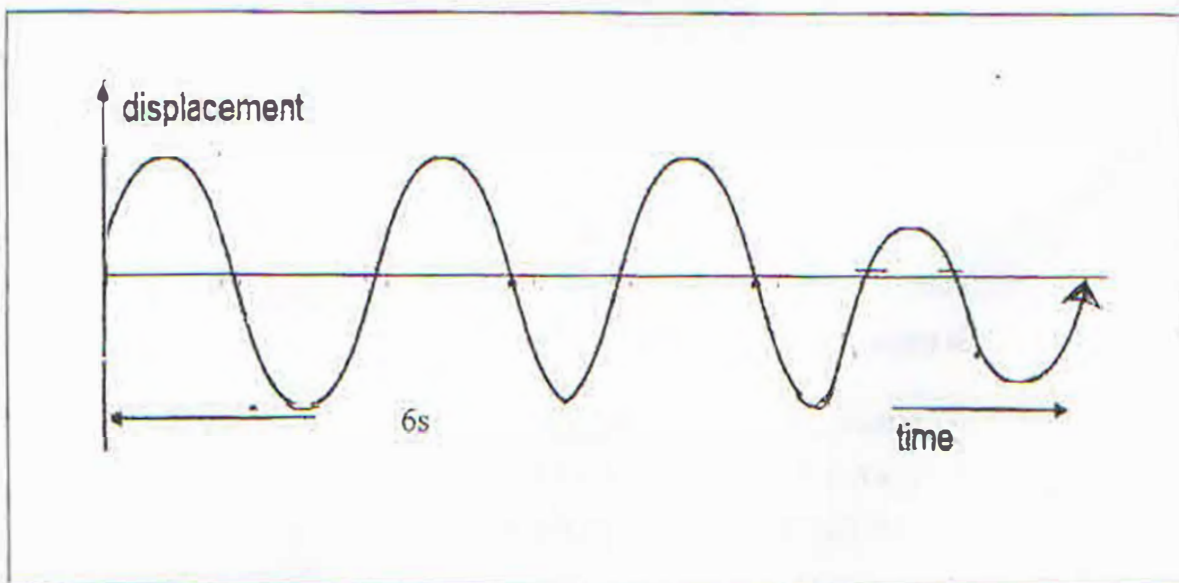
- A. Atomic number and mass number
- B. Mass number and atomic number
- C. Neutron number and proton number
- D. Neutron number and electron number.

16. In the nuclear reaction ${}^1_1\text{H} + {}^7_3\text{Li} \rightarrow x({}^4_2\text{He})$, what is the value of x:

- A. 1
- B. 2
- C. 3
- D. 4

17. In the figure. transverse waves are travelling in a medium. 3 cycles pass a particular point in the medium in 6 s. what is the frequency of the wave.

- A. 0.5 H2
- B. 2 H2
- C. 4 Hz
- D. 8 Hz

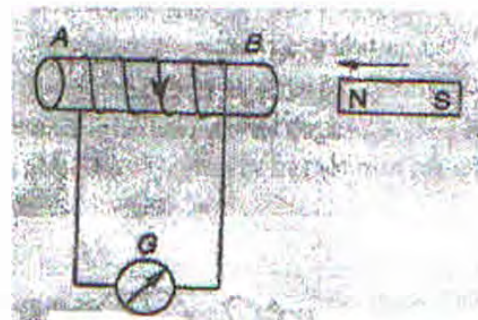


18. Which of the following is NOT true about resistance of a wire? Resistance :

- A. increase with length
- B. increase as the thickness increases
- C. depends on the material
- D. decreases as the thickness

19. In the figure a N pole of bar magnet is pushed into a coil of wire . Which of the following is NOT true?

- A. End B becomes N – pole
- B. The effect is called motor effect
- C. The effect is called generator
- D. Current flows in the direction shown by the pointer

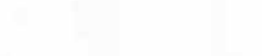


20. The nuclear reaction :



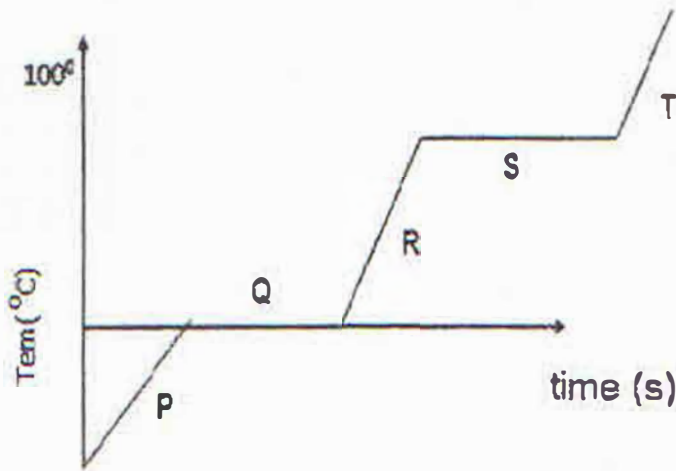
Is an example of:

- A. nuclear fission
- B. nuclear fusion
- C. nuclear disintegration
- D. rate of reaction.



PART TWO. STRUCTURED QUESTIONS. ANSWER ALL QUESTIONS

1. The graph shows the temperature change of 50g ice at -20°C to steam above 100°C .



- a) use the letter P, Q, R, S or T to describe the state of the block in each case:

- a) water _____
- b) steam e.g. T
- c) steam + water _____
- d) ice _____
- e) ice + water _____

(2marks)

- b) What happens in

- a) Stage Q ?.....
- b) Stage S ?..... (2marks)
- c) calculate the quantity of heat needed to melt 50 g of ice at 0°C to water at 0°C ($L = 340 \text{ j/g}$) (3 Marks)

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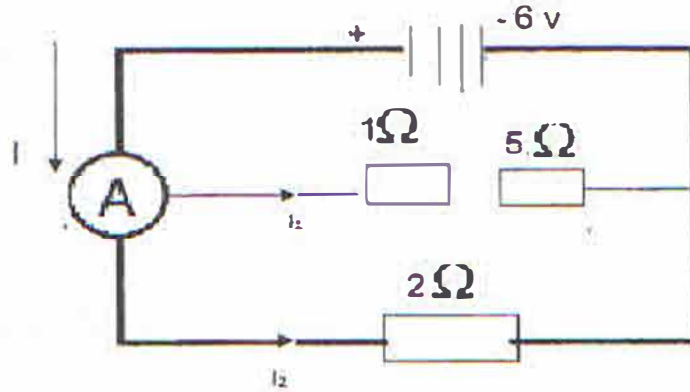
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2. A) Define electric current and give its unit. (2 marks)

.....

B) The circuit below shows three resistors arranged as in the diagram and a voltage of 6V is applied across them. (2marks)



i) Workout total resistance of the circuit? (3 marks)

.....

ii) Find the current I through the ammeter (current in the main circuit)? (2 marks)

.....

iii) Current I through the 2 ohm resistor. (2 marks)

.....

3. A) Define semiconductor?

(2 marks)

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.....
.....
.....
.....

B) Differentiate n and P type semiconductors?

(2 marks)

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.....
.....

c) Use the words **intrinsic** and **extrinsic** semiconductors to identify each of the following components :

Diode

Transistor

Light dependent resistor (LDR).....

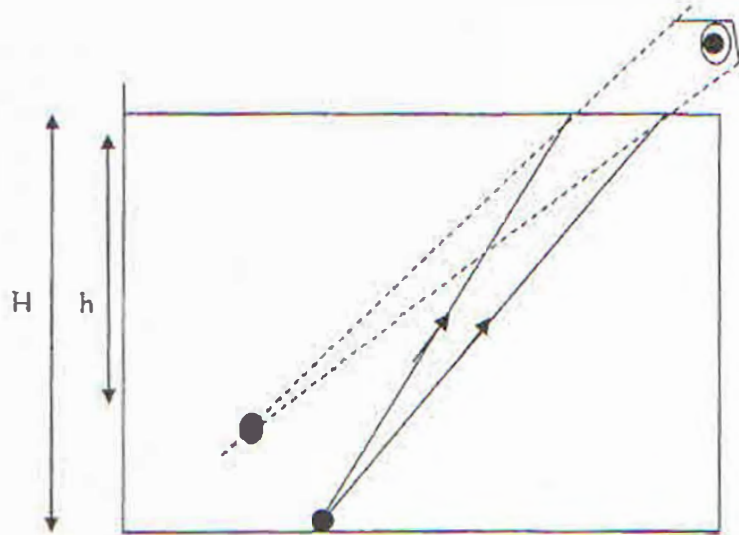
Light emitting diode (LED).....

Amplifier

Thermistor.....

(3 marks)

4. The bottom of water seems closer than it actually is :



a) What do the letters **H** and **h** represent (2marks)

.....
.....

b) The effect is due to of light. (2marks)

c) If $H = 12\text{m}$ and $n = 4/3$ (index of refraction of water), work out the value of h .

.....
.....
.....
.....

(3marks)

5. A car of mass, 1200 kg is pulled with constant force of 3000N in 20 s. Work out :

A) The acceleration resulted : (4x2 =8 marks)

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.....
.....
.....

B) Distance travelled by the car , in the given time ?

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.....
.....

C) Work done by the engine of the car.

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.....
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D) The kinetic energy of the Car.

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6. Radioactive decay is a process of disintegration of unstable nuclei. There are three types of nuclear radiations.

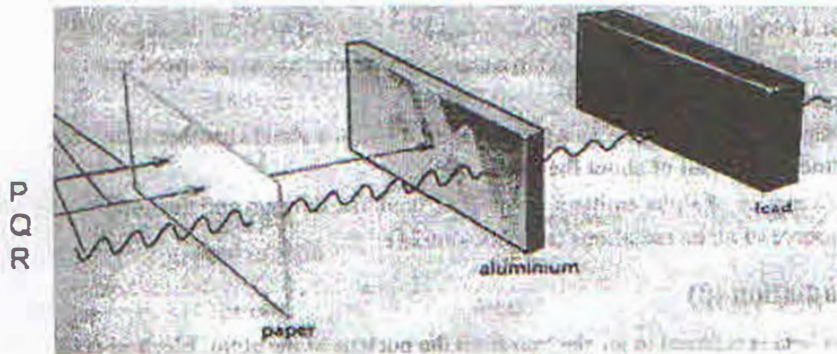
A) Which of the following is **NOT** nuclear radiations? tick one box . (2marks)

- Alpha rays
- Beta rays
- X- rays
- Gamma rays

B) Which of these radiations: (3marks)

- i) has positive charge ?
- ii) travels at the speed of light ?
- iii) is an electron emitted when nucleus decays ?

C) The diagram shows different penetrating powers of the three types of nuclear radiations. (3marks)



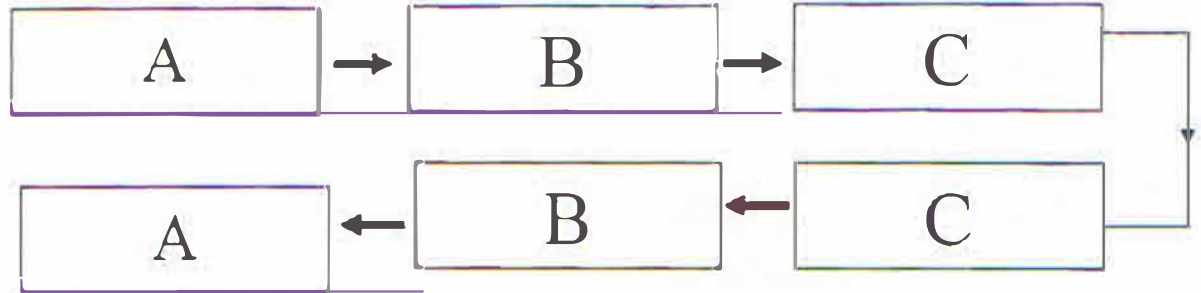
Label each radiation

P =

Q =

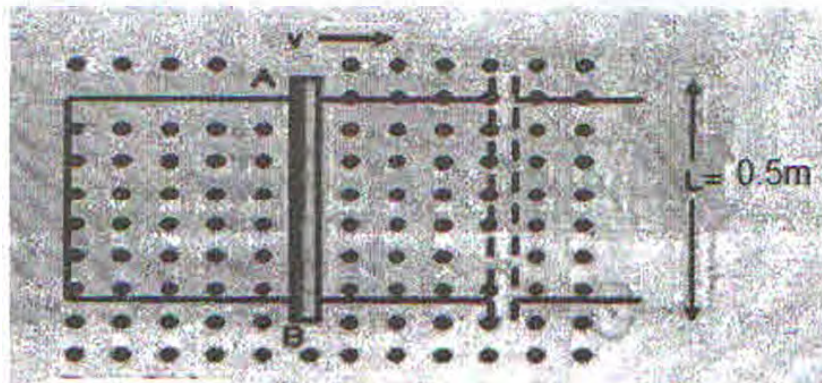
R =

7. The figure shows a block diagram for telecommunication system. Use the letters A to F to show what each block stands for : (6marks)



- Demodulator e.g E.....
- Transmitter
- Input transducer
- Modulator
- Output transducer
- Receiver

8. In the figure, 0.5m long wire is moved to the right, with a velocity of 8 m/s across a magnetic field of strength 0.6 T . The field goes out of the page.



- A) Workout the size of EMF induced in the wire?

.....

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.....

B. By FRHR the induced current flows

(2 marks)

from A to B

from B to A

(tick one box)

C. State two ways in which the size of the induced EMF can be increased :

(2marks)

1 :

2.

D. The effect is called

(2 Marks)

generator effect

transformer effect

END