

EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Physics

5054/1

Paper 1 Multiple Choice

Wednesday

8 NOVEMBER 2017

Additional Materials:

Multiple Choice answer sheet

Soft clean eraser

Soft pencil (type B or HB is recommended)

Electronic Calculator (non-programmable)/Mathematical tables

Time 1 hour

Instructions to Candidates

Look at the left hand side of your Answer card. Ensure that your **name**, the **school/centre name** and **subject paper** are printed. Also ensure that the **subject code**, **paper number**, **centre code**, **your examination number** and the **year** are printed and shaded. Do not change the already printed information.

Write your **name**, **centre number** and **candidate number** on the Answer Sheet in the spaces provided **unless** this has already been done for you.

There are **forty (40)** questions in this paper.

Answer all questions.

For each question there are four possible answers: **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the Answer Card provided.

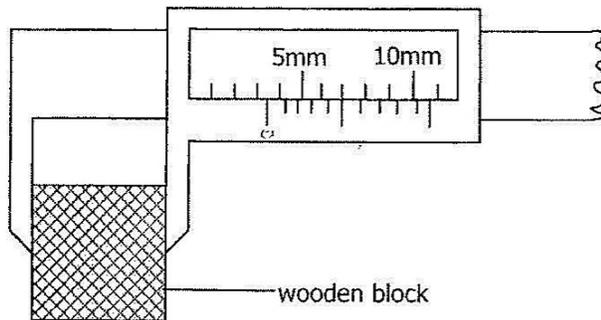
Information for Candidates

Each correct answer will score one mark.

Any rough working should be done in this Question Paper.

Cell phones are not allowed in the examination room.

- 1 The diagram below shows an instrument used to measure the width of a wooden block



What is the width of the block?

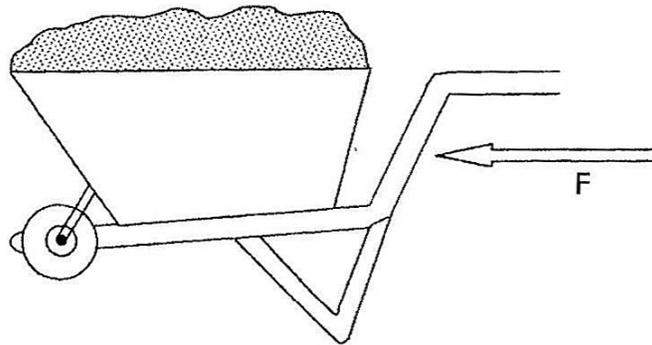
- A 3.5mm
 - B 5.3mm
 - C 8.0mm
 - D 8.5mm
- 2 In an experiment using a vacuum, a pendulum was used as a clock. What would be the time for three quarters of the pendulum's period?
- A 0.25 seconds
 - B 0.50 seconds
 - C 0.75 seconds
 - D 1.00 seconds
- 3 The mass of one ten ngwee coin is 0.40g and the density of its material is 8.0g/cm³. The total volume of a number of coins is 20cm³. How many ten ngwee coins are in this volume?
- A 0.05
 - B 0.50
 - C 40.00
 - D 400.00
- 4 A metallic ball of mass 0.1 kg falls with a constant velocity of 0.02m/s through a thick liquid. The resultant force on the ball while in motion is ...
- A 0.0N
 - B 0.1N
 - C 1.0N
 - D 1.2N

- 5 What is the maximum height reached by a ball projected upwards with velocity of 10m/s?
- A 2m
 - B 3m
 - C 5m
 - D 10m

- 6 A car starting from rest travels 36m in 6s. Find the car's acceleration and its velocity at this time.

	Acceleration (ms^{-2})	Velocity (ms^{-1})
A	0.2	0.12
B	0.4	2.00
C	1.0	6.00
D	2.0	12.00

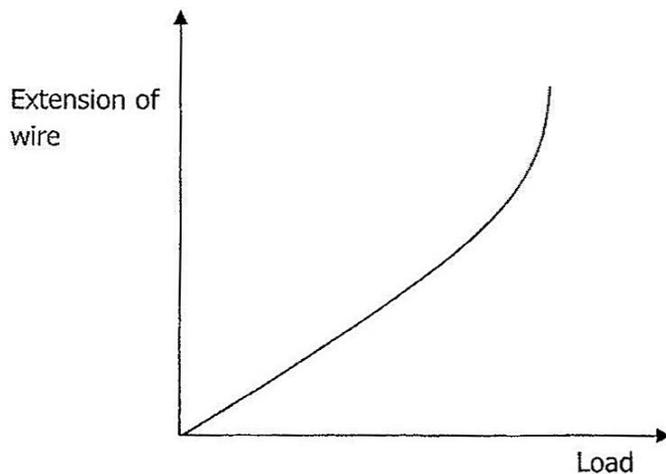
- 7 The diagram below shows a loaded wheel barrow. The mass of the wheel barrow and the load is 75kg.



A resultant horizontal force F is exerted on the wheel barrow and produces a horizontal acceleration of 2.4m/s^2 . What is the magnitude of F ?

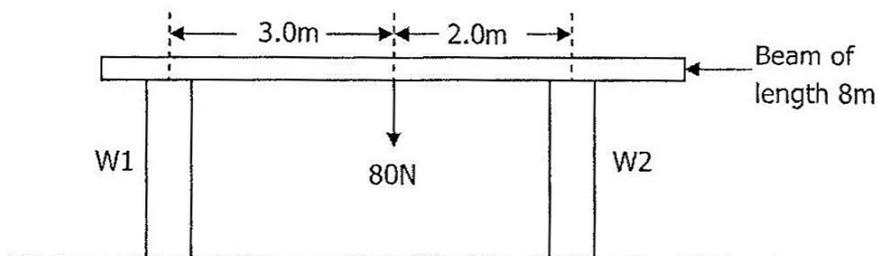
- A 1.80N
- B 18.00N
- C 180.00N
- D 1 800.00N

- 8 The graph below shows how the extension of a piece of copper wire increased as the load was increased.



What does the graph show?

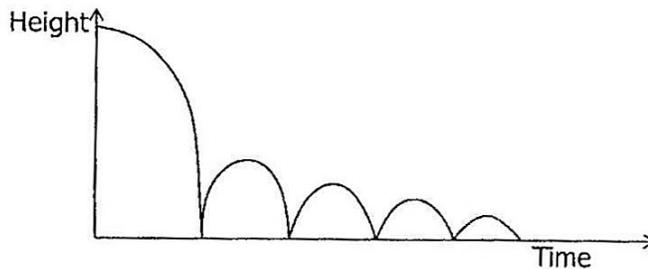
- A At a certain load the wire becomes easier to extend.
 - B At a certain load the wire becomes harder to extend.
 - C The load and extension are directly proportional for all loads.
 - D The load and extension are inversely proportional for all loads.
- 9 The diagram below shows a uniform beam of length 8m and of weight 80N, resting horizontally on top of two walls W1 and W2, with its centre of gravity at a distance of 3.0m from wall W1 and 2.0m from wall W2.



Calculate the support of each wall on the beam.

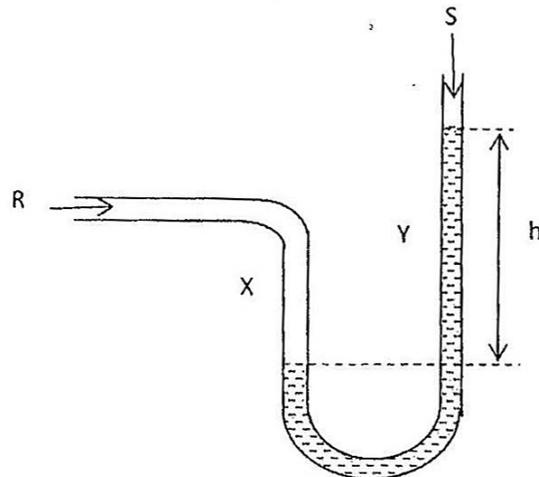
	W1	W2
A	22.9N	57.1N
B	26.7N	53.3N
C	32.0N	48.0N
D	40.0N	40.0N

- 10 The diagram below shows how the height above the ground of a bouncing ball changes with time.



Which statement explains why the height of each peak decreases with time?

- A The ball is wearing out.
 - B The ball gains energy on impact with the floor.
 - C Kinetic energy is converted to potential energy at each bounce.
 - D Kinetic energy is converted to thermal energy at each bounce.
- 11 Which of the following simple machine is **not** a force multiplier?
- A Bicycle
 - B Car jack
 - C Pliers
 - D See-saw
- 12 The diagram below shows a simple manometer that contains a liquid.



Side **X** is connected to a gas supply of pressure **R** and side **Y** is open to the atmospheric pressure **S**. Which pressure is the length **h** measuring?

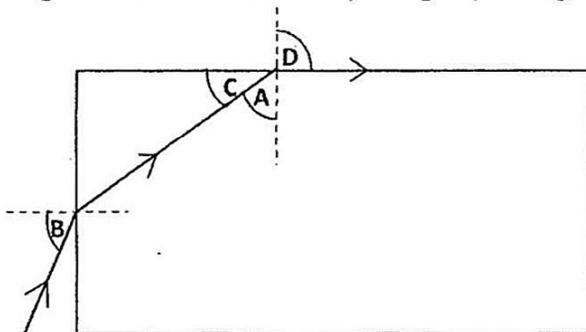
- A R
- B S
- C R + S
- D R - S

- 13 A mercury thermometer is calibrated by immersing it in turn, in melting ice and then boiling water. The column of the mercury is respectively 2.0cm and 22.0cm. Which of the following is the temperature when the column is 7.0cm long?
- A 5°C
 - B 7°C
 - C 20°C
 - D 25°C
- 14 5kg of pure ice at -5°C is melted at 0°C by a heater. What is the amount of heat required to melt the 5Kg of pure ice (Take C for ice = 2100J/KgK, $L_f = 336000\text{J/Kg}$ and C for water = 4200J/KgK).
- A $1.25 \times 10^6\text{J}$
 - B $1.63 \times 10^6\text{J}$
 - C $1.68 \times 10^6\text{J}$
 - D $1.73 \times 10^6\text{J}$
- 15 In a petrol engine, the piston strokes are in the order of ...
- A intake, compression, power, exhaust.
 - B intake, power, compression, exhaust.
 - C power, intake, compression, exhaust.
 - D intake, compression, power, exhaust.
- 16 A substance has a melting point of -17°C and a boiling point of 117°C. In which state does this substance exist at -17°C and 110°C.

	At -10°C	At 110°C
A	Liquid	Liquid
B	Solid	Gas
C	Solid	Liquid
D	Liquid	Gas

- 17 A local radio station broadcasts at 100.9MHz. What is the wavelength of the radio waves if they travel at a speed of $3.0 \times 10^8\text{m/s}$?
- A 2.97m
 - B 3.03m
 - C 3.36m
 - D 3.97m

- 18 Which of the following applications uses microwaves?
- A Detecting small cracks in metals
 - B Lighting a fluorescent tube
 - C Gaining a sun-tan
 - D Satellite television
- 19 Echo sounding equipment on a warship receives sound pulses reflected from the sea bed 0.06 seconds after they were sent out. If the speed of sound in sea water is 1800m/s.
- What is the depth of the water under the ship?
- A 0.54m
 - B 5.40m
 - C 54.00m
 - D 540.00m
- 20 What is the use of ultra sound waves?
- A Telephones
 - B Prenatal scanning
 - C Optical fibre cables
 - D Killing cancerous cells
- 21 The diagram below shows a ray of light passing through a glass block.

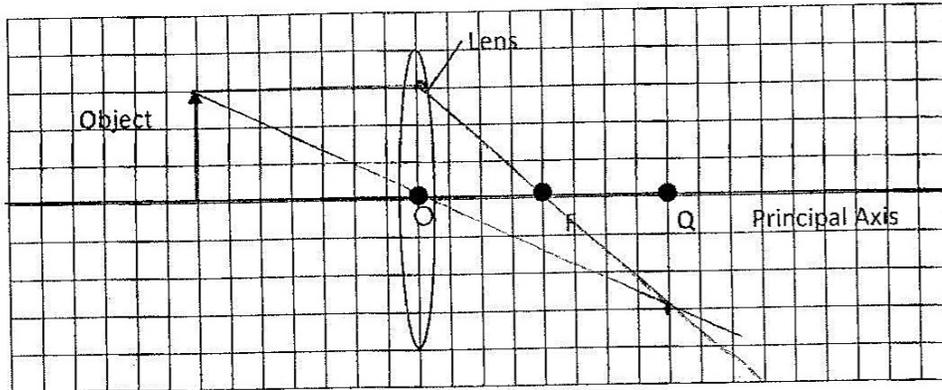


Which of the angles **A**, **B**, **C** or **D** is the critical angle for the light in the glass block?

- 22 Which row shows parts of the electromagnetic spectrum in order of increasing frequency?

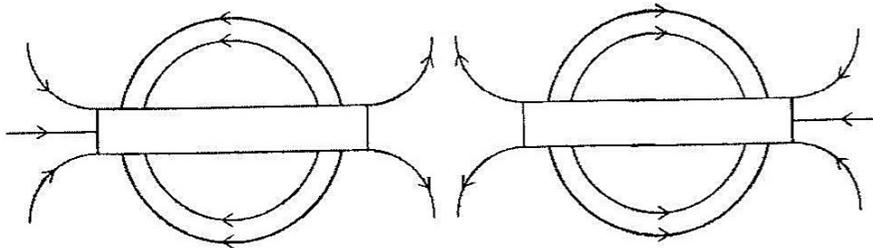
A	Radio Waves	X-rays	Visible light
B	Radio waves	Visible light	X-rays
C	X-rays	Radio waves	Visible light
D	X-rays	Visible light	Radio waves

- 23 A converging lens is used as a magnifying lens (glass) when the object is at ...
- A the focal point.
 - B two times the focal point.
 - C three times the focal point.
 - D the middle of the lens and the focal point.
- 24 The diagram below shows an object on the principal axis of a converging lens.



Where is the image formed? Between

- A O and F
 - B F and Q
 - C Infinity and the object
 - D Q and infinity
- 25 The diagram below shows magnetic field lines of a two bar magnets.



Which of the following pairs represent the above action?

- A

N	S
---	---

N	S
---	---
- B

N	S
---	---

S	N
---	---
- C

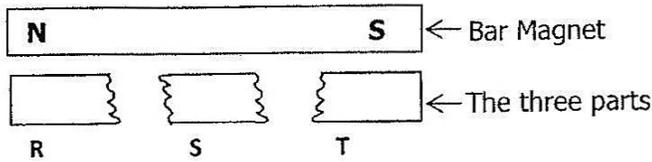
S	N
---	---

N	S
---	---
- D

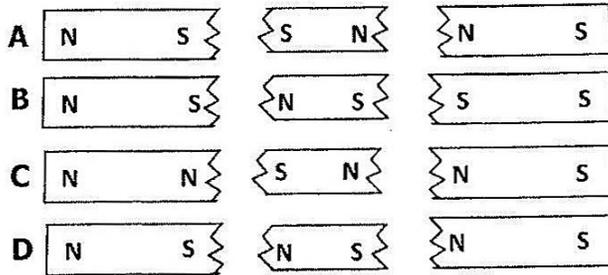
S	N
---	---

S	N
---	---

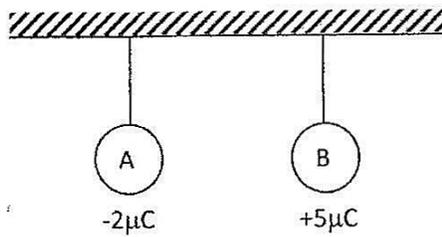
- 26 A bar magnet is broken into three parts **R**, **S** and **T** correctly?



Which diagrams shows the poles in **R**, **S** and **T** correctly?

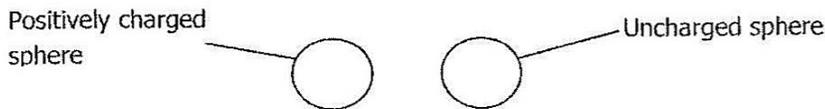


- 27 The figure below shows identical, charged metal spheres.

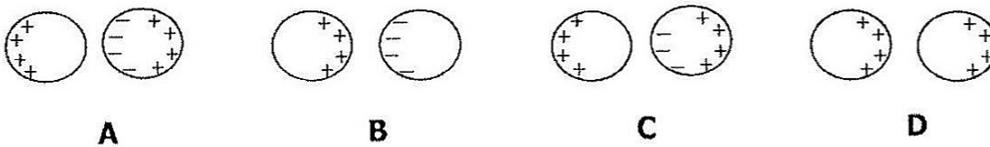


- A** 0 μ C
- B** +3 μ C
- C** -5 μ C
- D** +7 μ C

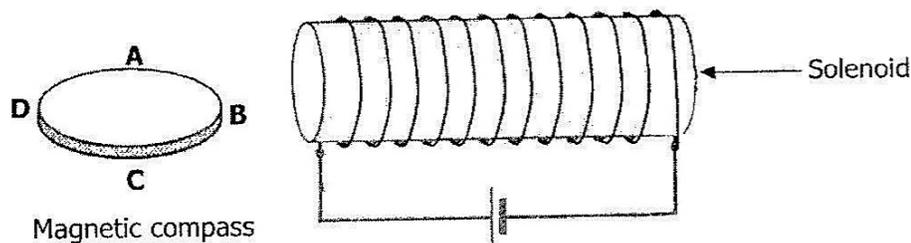
- 28 The diagram below shows a positively charged metal sphere brought closer to uncharged metal sphere.



Which diagram below shows the distribution of charges?

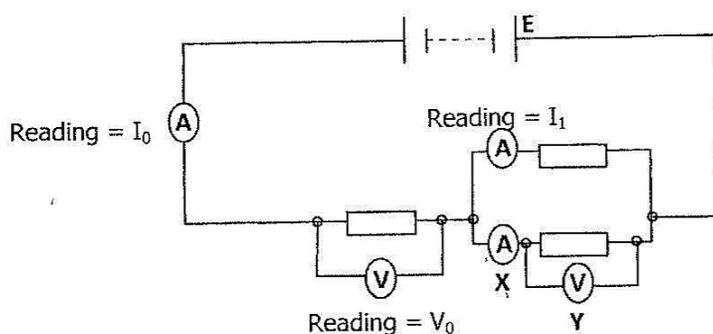


- 29 The diagram below shows a magnetic compass placed near a current carrying solenoid.



Towards which letter, will the magnetic compass needle point when the magnetic compass is brought near the solenoid?

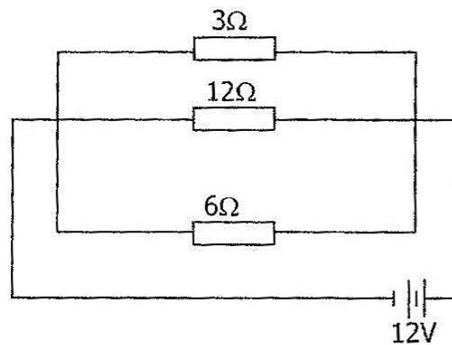
- 30 The diagram below shows a battery of e.m.f E , connected in a circuit containing three resistors.



The readings of two ammeters and a voltmeter are shown. What readings are on ammeter **X** and voltmeter **Y**?

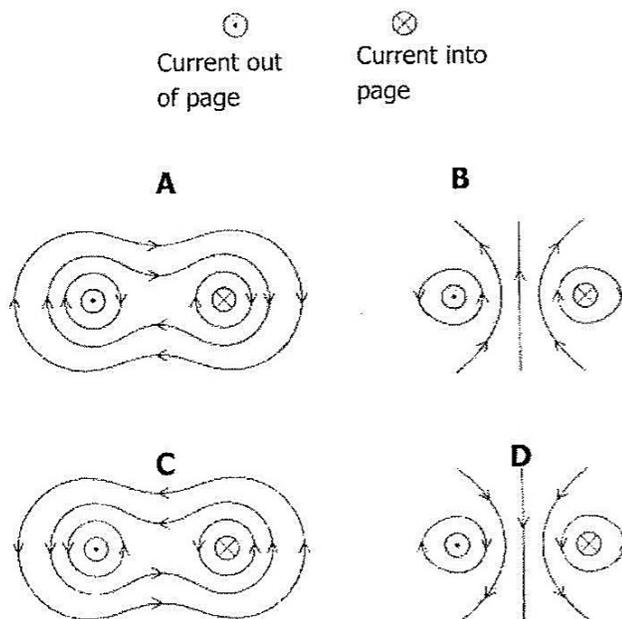
	X	Y
A	$I_0 - I_1$	$E - V_0$
B	$I_0 - I_1$	$E + V_0$
C	$I_0 + I_1$	$E + V_0$
D	$I_0 + I_1$	$E - V_0$

- 31 A small radio is rated 160W, 240V. What value of a fuse would be suitable for the plug of this radio?
- A 2A
 - B 5A
 - C 10A
 - D 15A
- 32 The diagram below shows three resistors in parallel and connected to a 12V battery.



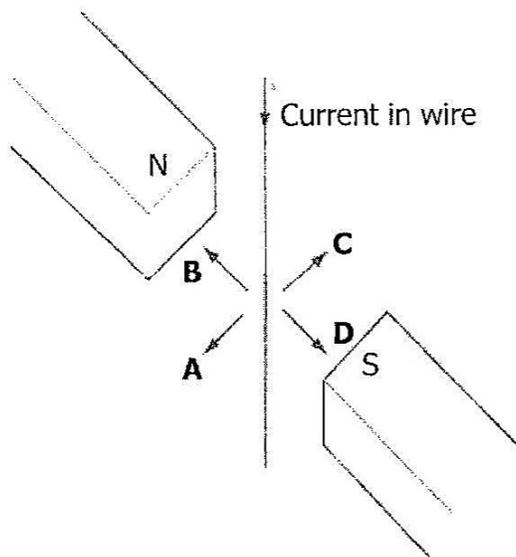
- What is the voltage in the 6Ω resistor?
- A 1V
 - B 4V
 - C 6V
 - D 12V
- 33 One kilowatt hour of energy cost K0.31. How much does it cost to run a 2KW heater for three hours?
- A K0.62
 - B K0.93
 - C K1.62
 - D K1.86

34 The diagram below shows two long straight wires close to each other.



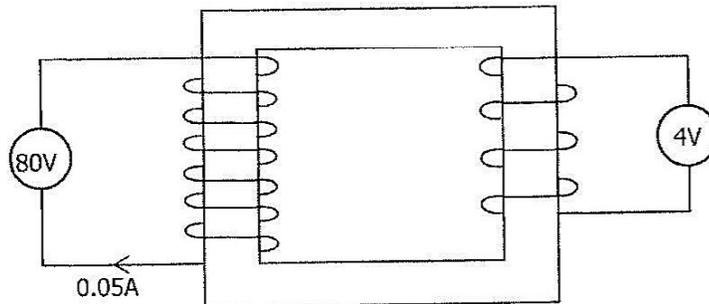
Which of the above shows the relationship between magnetic field and wires?

35 The diagram below shows a wire between poles of a magnet.



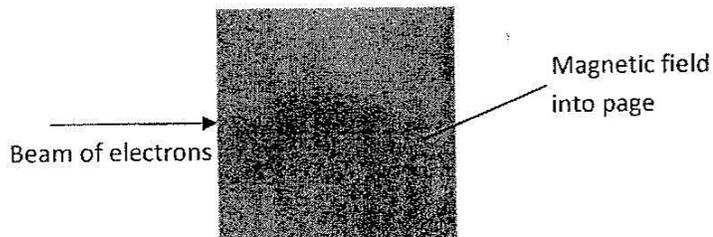
In which direction, will the wire move to as the current passes through it?

- 36 The diagram below shows a transformer.



What will be the current in the secondary coil, assuming the transformer is 100% efficient?

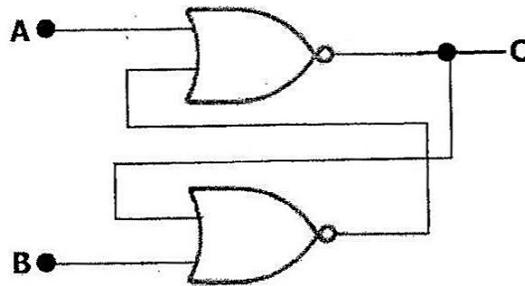
- A 1.0A
 - B 1.2A
 - C 2.0A
 - D 2.5A
- 37 The diagram below shows a beam of electrons entering a magnetic field.



In which direction are electrons being deflected?

- A Into the page
- B Out of the page
- C Towards the bottom of the page
- D Towards the top of the page.

38 The figure below shows a logic gate circuit.



Name the logic circuit and the gate used in the circuit.

	Name of gate	Name of circuit
A	NOT	Bistable
B	NOR	Bistable
C	NOT	Astable
D	NOR	Astable

39 A nucleus of the element cobalt is represented by the symbol ${}_{27}^{59}\text{Co}$.

What is the structure of this nucleus?

A	27	59
B	27	32
C	59	27
D	59	32

40 The half life of isotope X is four days and its initial mass is 32g.

What mass of the isotope will remain after twelve days?

- A 4g
- B 8g
- C 12g
- D 16g

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