

CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

0580 PHYSICS I General Certificate of Education Examination

0580 physics 1

JUNE 2017

ORDINARY LEVEL

Centre Number	_____
Centre Name	
Candidate Identification No.	
Candidate Name	

Mobile phones are NOT allowed in the examination room.

MULTIPLE CHOICE QUESTION PAPER

One and a half hours

INSTRUCTIONS TO CANDIDATES

Read the following instructions before you start answering the questions in this paper. Make sure you have a soft HB pencil and an eraser for this examination.

1. USE A SOFT HB PENCIL THROUGHOUT THE EXAMINATION.
2. DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Before the examination begins:

3. Check that this question booklet is headed "0580 Physics 1 - Ordinary Level"
4. Fill in the information required in the spaces above.
5. Fill in the information required in the spaces provided on the answer sheet using your HB pencil:
Candidate Name, Exam Session, Subject Code and Candidate Identification Number,
Take care that you do not crease or fold the answer sheet or make any marks on it other than those asked for in these instructions.

How to answer the questions in this examination

- 6 Answer **ALL** the 50 questions in this Examination. All questions carry equal marks.
- 7 Calculators are allowed.

- 8 Each question has FOUR suggested answers: **A**, **B**, **C** and **D**. Decide on which answer is appropriate. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the corresponding answer you have chosen.

For example, if C is your correct answer, mark C as shown below:

[A] [B] [C] [D]

Mark only one answer for each question. If you mark more than one answer, you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully, then mark your new answer.

Avoid spending too much time on any one question. If you find a question difficult, move on to the next question. You can come back to this question later.

9.

Do all rough work in this booklet using the blank spaces in the question booklet.

10. **At the end of the examination, the invigilator shall collect the answer sheet first and then the question booklet after. DO NO ATTEMPT TO LEAVE THE EXAMINATION HALL WITH ANY.**

You may find the following constants useful

12. - acceleration of free fall, $g = 10 \text{ m s}^{-2}$
The speed of light in vacuum $c = 3 \times 10^8 \text{ m s}^{-1}$
- the charge on an electron $e = 1.6 \times 10^{-19} \text{ C}$

Section 1 (Forty Two Questions)

Directions: Each of the questions or incomplete statements in this section is followed by four suggested answers. Select the best answer for each question

Questions 1 - 42

1. A couple can be defined as
 A the product of a force and the perpendicular distance from the pivot
 B the product of perpendicular force and distance from the pivot
 C two equal forces acting in the same direction
 D two equal forces acting at different points in opposite directions

- 2 Which of the following properties of a solid would change if it were transported from the earth to the moon?
 A Mass
 B Weight
 C Density
 D Surface area

3. Identify the pair of forces that are all non-contact forces from the pairs below
 A weight and up thrust
 B frictional force and electrostatic force
 C air resistance force and tension
 D magnetic force and weight

4. Compensating for friction on a runway means
 A reducing frictional forces to zero
 B raising one end of the runway.
 C adjusting the runway to balance friction with an equal but opposite force,
 D ignoring frictional force along the runway.

A trolley of fixed mass undergoes an acceleration of 5 m s^{-2} when a force of 15 N is applied. Assuming no external force acts on the system, what force will give the trolley an acceleration of 3 m s^{-2} ?

- A 15 N
 B 12 N
 C 9 N
 D 20 N
-
6. A spring balance reads 36.4 N when a mass hangs from it in air, and 32.0 N when the same mass hangs from it in a liquid. The up thrust on the mass in the liquid is
 A 68.4 N
 B 4.4 N
 C 34.2 N
 D 2.2 N

7. The acceleration of a moving body is defined as
 A the **rate of change** of displacement.
 B **the rate** of change of velocity.
 C the rate of change of displacement with time.
 D the rate of change of velocity with time.

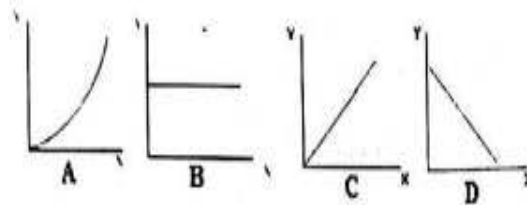
- 8 A graph of velocity is plotted against time for a car of mass 800 kg moving from one station to another. The area under the line and the time axis gives
 A the acceleration of the car.
 B the average speed of the car.
 C the distance covered by the car.
 D the momentum of the car.

During a handball match a boy of mass 60 kg running at a velocity of 4 m s^{-1} collides with another boy of mass 70 kg running at a velocity of 3 m s^{-1} towards him. The total momentum of the two boys before collision in kg m s^{-1} is

- A 30
 B 210
 C 240
 D 450

10. A body is accelerated from rest with an acceleration of 2 m s^{-2} . When it has travelled a distance of 9 m its speed will be
 A 2
 B 6
 C 3.5
 D 18

- 11 . Which of the graphs in Figure 1 below shows the relationship between the velocity Y of an object falling freely near the surface of the earth and time X?



12. Which of the following pairs is made of only renewable sources of energy?
 A Geothermal, sunlight.
 B Coal, wind.
 C Tide, natural gas.
 D Petrol, wood.

13. Which of the following energies is possessed by a stretched rubber band?
A Heat energy,
B Sound energy
C Electrical energy

D Potential energy,

14. The energy transferred from one object to another when there is a difference in temperature is
A Heat energy
B potential energy
C kinetic energy
D electrical energy.

15. Which of the following statements about energy conversion is true?

- A An electric motor converts kinetic energy to electrical energy
B A loud speaker converts electrical energy to sound energy
C An electric heater converts heat energy to electrical energy
D A burning log of wood converts potential energy to heat energy.

16. Hydraulic machines use oil instead of water because

- A oil is less viscous
B oil is incompressible
C oil is translucent
D oil prevents rusting.

17. The SI unit of pressure is

- A pascals (Pa)
B millimetres of Mercury (mmHg)
C bars (Ba)
D atmospheres (atm)

18. When the cutting edge of a knife is sharpened it cuts easier because it exerts

- A more pressure on the object
B less pressure on the object
C less force on the object
D more force

19. The temperature of a body is 360 K. What is this value in degrees Celsius?

- A 87
B 186
C 273
D 260

20. A stone of mass 250 g displaced water in a measuring cylinder from 35 cm³ mark to the 90

cm³ mark. Its density in g cm⁻³ is

- A 7.14
B 4.55
C 2.78
D 0.22

21. Which of the graphs in figure 2 best shows the relationship between the pressure Y and depth X of water in a pond?

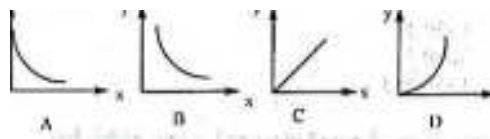


Figure 2

22. When water at 100 °C is heated to turn to vapour

- A the mass of the water increases
B the kinetic energy of its molecules remains the same
C the potential energy of its molecules decreases
D the density of the water increases

23. Why is it important to lag the calorimeter and its contents when measuring the specific heat capacities of solids and liquids?

- A To ensure even distribution of heat
B To ensure good electrical contact
C To measure accurate temperature changes
D To prevent heat loss to the environment.

24. The lower fixed point of a mercury thermometer is

- A the temperature of mercury at standard atmospheric pressure.
B the temperature of pure melting ice.
C the temperature of pure boiling water at standard atmospheric pressure,
D the temperature of pure melting mercury.

25. The lower and upper fixed points of a non- graduated thermometer are at the 6 cm and 42 cm marks respectively. The fundamental interval of the thermometer is

- A 36 cm
B 42 cm
C 48 cm
D 6 cm

Turn over

26. How many joules of heat energy are supplied by an electric heater rated 8 kW in 10 s?
 A 0.8 J
 B 80 J
 C 8000 J
 D 80000 J

27. An object of mass 1.5 kg has a specific heat capacity of 450 J kg⁻¹ K⁻¹. What quantity of heat energy is needed to raise its temperature from 296 K to 316 K?
 A 13500 J
 B 1350J
 C 3000 J
 D. 135000J

28. A positively charged glass rod is one which has
 A gained protons
 B lost protons
 C gained electrons
 D lost electrons

29. A radio set is rated 12V 100W. A fuse that can be used to protect the radio set must have a value of
 A 12 A
 B 8 A
 C 9 A
 D 10 A

30. Three 2Ω resistors are connected as shown in figure 3 below.

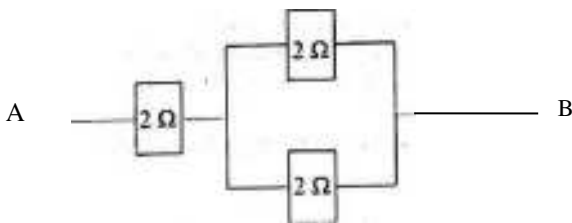


Figure 3

The combined resistance across AB is

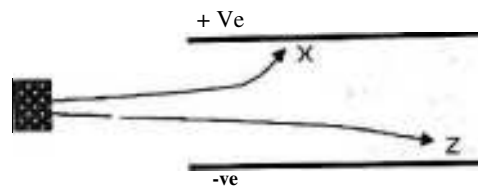
- A 2 Ω
 B 3 Ω
 C 4 Ω
 D 6 Ω
31. Which of the following rules can be used to determine the magnetic field direction about a straight current-carrying conductor?
 A Cork Screw rule
 B Fleming's Left Hand rule
 C Fleming's Right Hand rule
 D Left Hand Grip rule

- 4 32. A material that is easily magnetised and easily demagnetised is referred to as
 A an electromagnet
 B a hard magnetic material
 C a soft magnetic material
 D a non-magnetic material

33. A transformer is used to operate a 24V radio from a 240 V mains supply. Which of the following statements is true?
 A The **input current in** the transformer is direct
 B The transformer has more turns in the secondary than in the primary
 C The transformer is a step-down transformer
 D The turns ratio N_S/N_P of the transformer is 10:1

34. Isotopes of the same element have different numbers of
 A electrons
 B protons
 C ions
 D neutrons

35. Two nuclear radiations X, and Z are passed through an electric field as shown in figure 4.



The radiations are

- A X = alpha, Z = Gamma
 B X = Beta, Z = Gamma
 C X = Beta, Z = Alpha
 D X = Alpha, Z = Beta
- 36 Radium - 226 (${}^{226}_{88}\text{Ra}$) decays to a daughter nuclide by the emission of two β particles according to ${}^A_Z\text{X}$ the following equation:

$${}^{226}_{88}\text{Ra} \rightarrow {}^N_Z\text{X} + 2 {}^0_{-1}\beta$$

 The value of Z is
 A 86
 B 84
 C 90
 D 92

37. Which of the following statements about gamma rays is correct?

- A They carry a negative charge
- B They are deflected by electric fields
- C They are the least penetrating
- D They are not deflected by magnetic fields.

38. Which of the graphs in figure 5 best shows the relationship between the activity Y of a radioactive substance and the time of decay X?

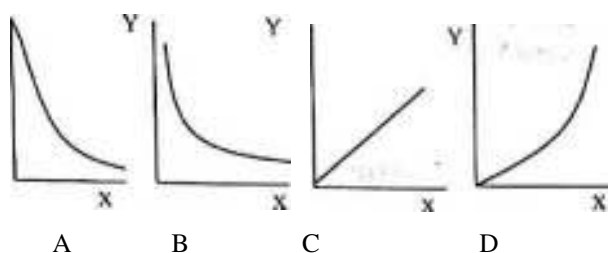


Figure 5

39. A student stands 10.0 cm in front of a plane mirror and sees his image in the mirror. How far is he from his image?

- A 5.0 cm
- B 10.0 cm
- C 20.0 cm
- D 100.0cm

40. The image formed by a convex lens used as a magnifying glass is

- A upright, real and larger than the object
- B upright, real and smaller than the object
- C upright, virtual and larger than the object
- D upright, virtual and smaller than the object.

41. A ray of light is reflected by a mirror as shown in figure 6.

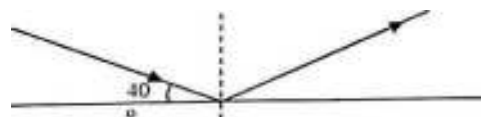


Figure 6

The angle of reflection is

- A 40°
- B 50°
- C 90°
- D 90°

42. When an object is placed beyond 2F in front of a diverging (concave) lens, the image formed has the following characteristics,

- A Virtual, and erect
- B Diminished, and inverted
- C Virtual, and magnified
- D Real and erect.

Section 2 (Eight Questions)

Directions: These groups of the questions deal with practical situations. Each situation is followed by a set of questions. Select the best answer for each question.

Questions 43 - 47

The setup in figure 7 is used by a student to investigate the relationship between the current flowing through a conductor Y and the potential difference across its ends.

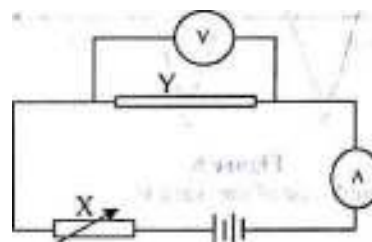


Figure 7

42. The component X is called

- A ammeter
- B resistor
- C rheostat
- D voltmeter

44. What property of A permits it to be connected as shown?

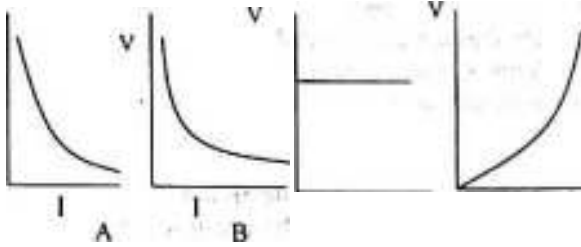
- A It has a very high resistance
- B It has a very low resistance
- C It cannot easily be damaged
- D It has a very low conductivity

45. The slope of a graph of the p.d. across Y plotted against the current through it represents

- A conductivity
- B Current
- C Voltage
- D Resistance

Turn over

46. If Y is a filament bulb, which of the following graphs shows how p.d. V varies with current I?



49. If the wave is travelling at a speed of 100 ms^{-1} , the wavelength of the wave is

- A 5000 m
- B 150 m
- C 2 m
- D 0.5 m

50. Two points in phase on the waveform are

- A W and X
- B W and Y
- C W and Z
- D X and Y

Questions 47-50

The waveform in figure 8 is produced by an instrument vibrating at a frequency of 50 Hz connected to a cathode ray oscilloscope.

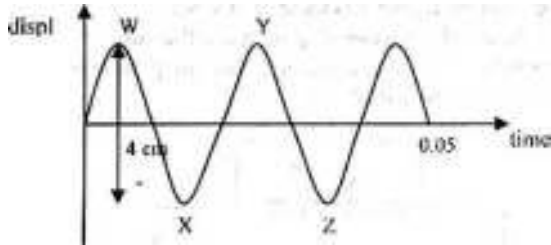


Figure 8

47. The amplitude of the wave is

- A 4 cm
- B 0.05 cm
- C 2 cm
- D 8 cm

48. The period of oscillation of the wave is

- A 50 s
- B 2.5 s
- C 0.01 s
- D 0.02 s

STOP

GO BACK AND CHECK YOUR WORK