CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

General Certificate of Education Examination

0580 PHYSICS 1

JUNE 2020 **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 carefully 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. Non-programmable and cordless calculators are allowed.
8. Each question has FOUR suggested answers: **A, B, C** and **D**. Decide 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]

9. 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.
10. 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.
11. Do all rough work in this booklet using the blank spaces.
12. **At the end of the examination, the invigilator shall collect the answer sheet first and then the question booklet. DO NOT ATTEMPT TO LEAVE THE EXAMINATION HALL WITH IT.**

You may find the following constants useful

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

Section 1 (Forty Three 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 – 43

1. The base unit of length is:
   A mm
   B cm
   C m
   D km

2. Which of the following is a physical quantity?
   A metre
   B 3 seconds
   C 100
   D joule

3. A body is taken from the equator to the North Pole.
   A Its mass decreases and its weight remains constant
   B Its mass remains constant but its weight increases
   C Its mass increases and its weight remains constant
   D Its mass and its weight both remain constant

4. A ball is thrown downward at 5 m s^{-1} from a roof 10 m high. Its velocity when it reaches the ground is:
   A 13 m s^{-1}
   B 14 m s^{-1}
   C 15 m s^{-1}
   D 20 m s^{-1}

5. An experiment is carried out to determine the acceleration of free fall by timing the direct fall of a steel ball, from an initial velocity of zero through a given height. The equation of motion that is used to process the data collected in the experiment is:
   A $v = u + at$
   B $s = ut + \frac{1}{2}at^2$
   C $s = \frac{(u+v)}{2}t$
   D $v^2 = u^2 + 2as$

6. Energy is defined as:
   A Rate of doing work
   B $\frac{energy\ output}{energy\ input}$
   C $\frac{work\ input}{work\ output}$
   D Ability to do work

7. A stone of mass 0.2 kg is moving with a velocity of 20 m s^{-1}. How much kinetic energy does the stone possess?
   A 2 J
   B 4 J
   C 20 J
   D 40 J

8. Which of the following energy sources are all renewable sources?
   A Wood, wave, animal waste
   B Sun, Uranium, tides
   C Geothermal, coal, wind
   D Petrol, flowing water, Sun

9. A machine has a velocity ratio of 9 and needs an effort of 10 N to lift a load of 50 N. The efficiency of the machine is:
   A 11.1 %
   B 20.0 %
   C 55.6 %
   D 66.7 %

10. When a trumpet and a guitar are used to play the same musical note a difference is noticed. This difference is due to the:
    A fundamental
    B overtones
    C frequency
    D pitch

11. A ray of light from a raybox is directed into a rectangular glass block as shown in figure 1.

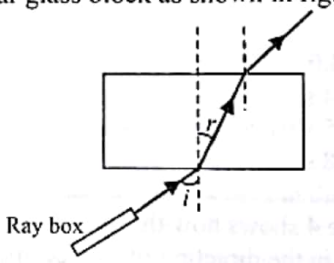

Figure 1

Angles of incidence $\hat{i}$ and corresponding angles of refraction $\hat{r}$ are measured. The graph of sin $\hat{i}$ (y-axis) against sin$\hat{r}$ (x-axis) obtained from this experiment is:

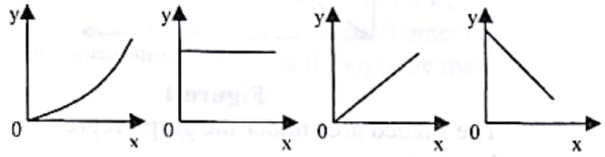

Figure 2

12. An object is placed at a point beyond 2F from a converging lens, The image formed is:
    - A real, diminished, inverted
    - B real, magnified, erect
    - C virtual, magnified, erect
    - D real, same size, inverted

13. The primary coil of a transformer is often wound on the secondary coil so as to prevent:
    - A high resistance losses
    - B hysteresis losses
    - C flux linkage losses
    - D eddy current losses

14. The numerical value of absolute zero in degree Celsius is:
    - A 273
    - B 100
    - C 0
    - D -273

15. When a radioactive atom undergoes beta decay:
    - A the proton number decreases by 1 and the nucleon number remains the same
    - B the proton number increases by 1 and the nucleon number remains the same
    - C the proton number remains the same and the nucleon number decreases by 1
    - D the proton number remains the same and the nucleon number increases by 1

16. A cellulose acetate rod rubbed with cloth:
    - A gains protons and becomes positively charged
    - B gains electrons and becomes negatively charged
    - C losses protons and becomes negatively charged
    - D losses electrons and becomes positively charged

17. Electromotive force (EMF) is measured in:
    - A newtons
    - B amperes
    - C volts
    - D joules

18. The effective resistance of a 12 Ω resistor and a 6 Ω resistor connected in parallel is:
    - A ¼ Ω
    - B 4 Ω
    - C 6 Ω
    - D 18 Ω

19. A 2400 W electric iron is used at maximum output for 6 hours in a month. If the cost of a unit of electricity is 60 FCFA, how much will the user pay as electricity bill for that month?
    - A 8640 FCFA
    - B 1440 FCFA
    - C 864 FCFA
    - D 360 FCFA

20. If the distance between two charges Q_1 and Q_2 is doubled, the electrostatic force of repulsion between them will:
    - A reduce
    - B increase
    - C double
    - D remain the same

21. An open can containing a little water is heated until the water boils. The can is then closed tightly and cold water poured on the can. The sides of the can collapse because:
A the water outside cools rapidly
B the external pressure increases rapidly
C the internal pressure reduces rapidly
D the water inside cools rapidly

22. Which of the following instruments is an application of Hooke's Law?
A Bourdon gauge
B Manometer
C Beam balance
D Newton meter

23. When a bucket full of water is being pulled out of a well, it appears lighter when it is still in the water than when it is out of water. The "apparent lightness" is caused by:
A upthrust
B friction
C tension
D weight

24. Which of the following physical quantities has newton-metre as the unit?
A Momentum
B Work
C Pressure
D Power

25. Figure 3 shows a tin of milk rolling down an inclined plane.

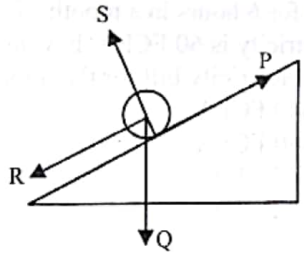

Figure 3

The force which prevents the tin from sliding is:
A P
B Q
C R
D S

26. A ripe mango falls from a tree $32\ m$ tall. If its initial velocity is zero, the time it takes to reach the ground is:
A 64.0 s
B 6.4 s
C 2.5 s
D 1.8 s

27. **Figure 4** shows how the displacement of an object in the direction of a force applied varies with the force.

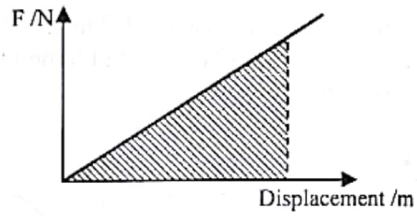

Figure 4

The shaded area under the graph represents:
A power
B work
C moment
D momentum

28. The best reason why aluminium is often preferred to steel in the construction of aircraft is that aluminium:
A does not rust
B has a lower density
C has a shinny appearance
D has a higher mass per unit length

29. An electromagnetic radiation which is emitted from the nucleus of an atom is:
A alpha radiation
B gamma radiation
C X-ray
D infrared radiation

30. It is not possible to predict which atom of a particular radioactive sample will decay. This is because:
A radioactive decay is a random process
B radioactive decay is a spontaneous process
C during radioactive decay the mass of the radioactive isotope reduces
D the half-life a particular radioisotope is constant

31. The specific heat capacity of a material depends on the:
    A nature of the material
    B thermal energy gained by the material
    C mass of the material
    D temperature change of the material

32. When one end of an iron rod is held in the hand and the other end is inserted into a flame and left there for a few minutes, heat energy soon reaches the hand by:
    A convection
    B radiation
    C conduction
    D convection and radiation

33. On a certain filament bulb is written 220 V, 80 W. The resistance offered by the filament when a current of4/11A flows through the main supply is:
    A 3 Ω
    B 2 Ω
    C 364 Ω
    D 60 Ω

34. Which of the following elements should be added to germanium to produce a p-type semiconductor?
    A Phosphorus
    B Copper
    C Boron
    D Silicon

35. Which of the following quantities determines the loudness of a sound?
    A Wavelength
    B Frequency
    C Overtones
    D Amplitude

36. The critical angle for a ray of light incident in water at a water-air boundary is 47.8°. The refractive index of water is:
    A 0.7
    B 1.0
    C 1.4
    D 1.9

37. When the net force acting on an object reduces, the acceleration of the object:
    A reduces
    B doubles
    C increases
    D remains the same

38. Which of the graphs in figure 5 represents a velocity-time graph for an object accelerating uniformly from rest?

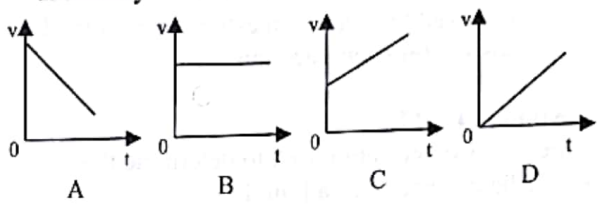

Figure 5

39. Heavy duty vehicles usually have large and broad tyres. Of what advantage is this?
    A To exert a small force on the ground
    B To support the heavy weight of the vehicle
    C To exert a small pressure on the road
    D To reduce the stability of the car

40. The Electromotive force of a cell is given as1.5 V. This means that the cell can supply:
    A 1.5 A of current
    B 1.5 J of energy
    C 1.5 J of energy per ampere of current
    D 1.5 J of energy per coulomb of charge

41. Which of the following devices is a rectifier?
    A Diode
    B Rheostat
    C Resistor
    D Transformer

42. Which of the radiations or particles below is most ionising?
    A Beta particles
    B X-rays
    C Gamma radiation
    D Alpha particles

43. Which of the graphs in figure 6 is the velocity-time graph for a body falling freely in air, and attaining a terminal velocity?

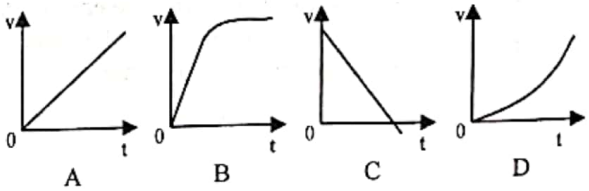

Figure 6

Section 2 (Seven Questions)

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

Questions 44 – 47

Figure 7 shows the setup used to determine the specific heat capacity of a liquid.

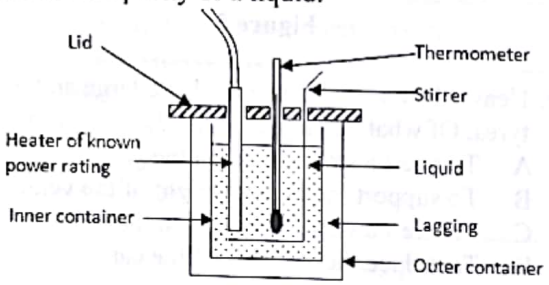

Figure 7

44. Specific heat capacity is the energy needed to:
    - A raise a unit mass of the liquid by one degree Celsius
    - B change a unit mass of the liquid to gas at constant temperature
    - C raise the temperature of the liquid by one degree Celsius
    - D raise the temperature of a unit mass of the liquid by one degree

45. The two other important items necessary for the experiment but that are **NOT** shown in the setup are:
    - A voltmeter and ammeter
    - B voltmeter and scale balance
    - C stopwatch and ammeter
    - D stopwatch and scale balance

46. Lagging is used in the experiment in order to:
    - A prevent heat exchange with the environment
    - B reduce heat exchange with the environment
    - C increase heat exchange with the environment
    - D prevent direct contact between the inner container and the outer container

47. A similar setup can be used to determine the specific heat capacity of a metal block. The item in the setup above that will NOT be needed is the:
    - A lid
    - B lagging
    - C thermometer
    - D stirrer

Questions 48 – 50

Figure 8 shows a rectangular coil WXYZ carrying a current and located between the pole pieces of a horse-shoe magnet.

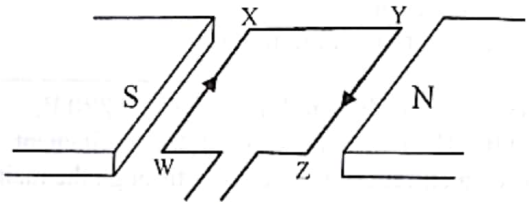

Figure 8

48. When current flows through the coil in the direction shown in the diagram, the coil:
    - A rotates in the clockwise direction
    - B rotates in the anticlockwise direction
    - C moves into the page
    - D moves out of the page

49. The direction of the force acting on the rectangular coil, WXYZ, was determined using:
    - A Fleming's left hand rule
    - B Fleming's right hand rule
    - C Right hand grip rule
    - D Faraday's law

50. The motion of the coil WXYZ can be decreased by:
    - A using a larger coil
    - B having fewer turns of coil
    - C using a weaker magnet
    - D reversing the magnetic pole pieces

STOP

GO BACK AND CHECK YOUR WORK