CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD
Technical and Vocational Education Examination

ENGEERING SCIENCE 1
5155

JUNE XXXX **INTERMEDIATE LEVEL**

Centre No. & Name	
Candidate No.	
Candidate Name	

Mobile phones are **NOT** allowed in the examination room.

5155 ENGEERING SCIENCE 1: MULTIPLE CHOICE QUESTION PAPER

1 hour 30 minutes

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 "**Intermediate Level – 5155 ENGEERING SCIENCE 1**.
4. Insert the information required in the spaces above.
5. Insert the information required in the spaces provided on the answer sheet using your HB pencil:

   Candidate Name, Exam Session, Subject Code, Centre Number and Candidate Number.

   Take care that you do not erase 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. Each question has FOUR suggested answers: **A, B, C** and **D**. Decide which answer is correct. 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 answer you have chosen.

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

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

8. 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.
9. 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.
10. Do all rough work in this booklet, using, where necessary, the blank spaces in the question booklet.
11. **You must not take this booklet and the answer sheet out of the examination room. All question booklets and answer sheets will be collected at the end of the examination.**

1. The S.I. unit of pressure is:
   A N/m
   B Nm^2
   C N/m^2
   D Nm

2. Elastic collision means objects collide and
   A stick together
   B bounce off each other
   C their velocity decreases
   D come to rest

3. The quantity that measures the ability of a force to rotate an object round the same axis is
   A Moment
   B Momentum
   C Torque
   D Couple

4. What are the forces acting on a floating body ?
   A Weight and reaction force
   B Upthrust and reaction force
   C Weight and upthrust
   D Weight and viscosity

5. Figure 2 shows a force being applied to a lever to lift a heavy weight.

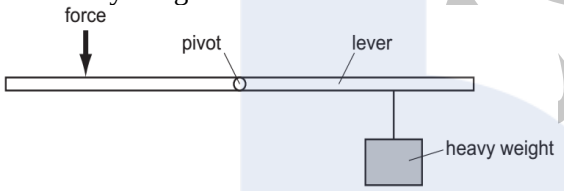

Figure 2

Which change would enable the heavy weight to be lifted with a smaller force?
   A Move the force to the right
   B Move the heavy weight to the right
   C Move the force to the left
   D Move the pivot to the left

6. One characteristic of pressure in a liquid is ?
   A Pressure decreases with density
   B Pressure increases with depth
   C Pressure acts unequally in all directions
   D Pressure acting at all points on the same level are different

7. Which situation is an example of a force acting over a large area to produce a small pressure?
   A A builder hammering a nail into a piece of wood
   B A cook using a sharp knife to cut vegetables
   C A nurse pushing a needle into a patient's arm
   D A soldier marching in flat-soled boots

8. The graph in figure 1 represents part of the journey of a car.

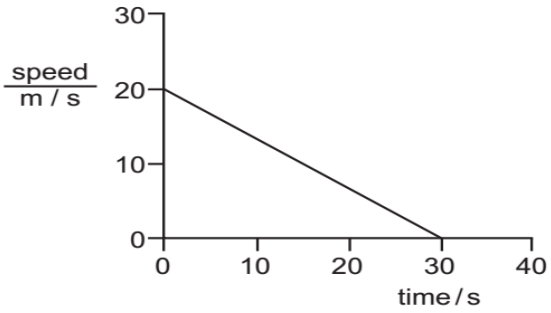

Figure 1

What distance does the car travel during this part of the journey?
   A 150m
   B 300m
   C 600m
   D 1200m

9. An electric kettle converts
   A Electrical energy to chemical energy
   B Chemical energy to kinetic energy
   C Chemical energy to heat energy
   D Electrical energy to heat energy

10. At what point does the kinetic energy of a falling object equals its potential energy with respect to the ground ?
   A At the start of the fall
   B Midway of the fall
   C Just as it strikes the ground
   D When it comes to rest

11. A current of 0.5A flows through an appliance when connected to a 4V battery. How much heat energy is dissipated in the appliance after 2minutes?
   A 4J
   B 8J
   C 240J
   D 480J

12. A girl whose weight is 600N runs up a flight of stairs 10m high in 12s. The average power she delivers is
   A 72 W
   B 500 W
   C 720 W
   D 7200 W

13. What are the energy changes that take place in a

hydroelectric power plant?
A Chemical → kinetic → electrical
B Electrical → potential → kinetic
C Potential → kinetic → electrical
D Kinetic → electrical →potential

14. The ore from which aluminium is extracted is called
A Cryolite
B Cuprite
C Hematite
D Bauxite

15. Copper is used as a conducting wire because of its
A Low resistivity
B Low conductivity
C Low malleability
D Low density

16. Why is it that all pressing iron handles are covered with plastics ?
A To prevent heat loss from the electric iron
B To prevent it from burning our hands
C To prevent against electric shock
D To make it look beautiful

17. Why is mild steel used instead of iron to make car bodies?
A Iron cannot be painted.
B Mild steel does not rust
C Mild steel is more brittle than iron
D Mild steel is stronger than iron

18. Shadows and eclipses result from
A Diffraction
B Reflection
C Refraction
D Dispersion

19. Which pair of colour light is complementary?
A Blue and yellow
B Red and blue
C Red and green
D Yellow and cyan

20. Which of the letters in figure 3 shows the correct path of a ray of light from air through a glass block?

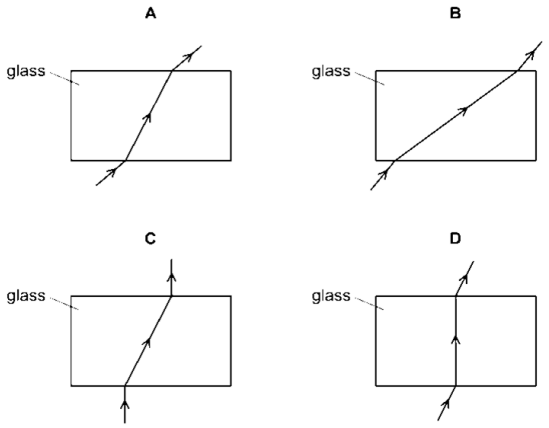

Figure 3

21. The time taken to complete a wave cycle is called
A Half life
B Frequency
C Duration
D Period

22. A student claps once when standing 100m away from a large wall. The speed of sound in air is 330mls. How long after clapping does the student hear the echo ?
A 0.30s
B 0.61s
C 1.7s
D 3.3s

23. The diagram in figure 4 shows a section through a series of waves on water. Which dotted line shows the position of the still water surface after the waves have passed?

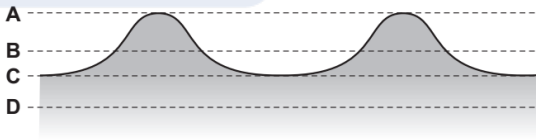

Figure 4

24. In a circuit, an ammeter is connected in
A Parallel because of its high internal resistance
B Parallel because of its low internal resistance
C Series because of its high internal resistance
D Series because of its low internal resistance

25. An appliance is connected to a mains supply as shown in figure 5. Its circuit also contains a switch and a fuse. Which circuit shows the fuse in the correct position?

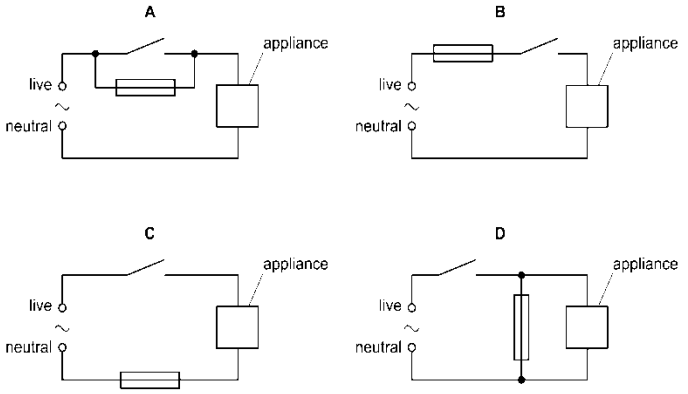

Figure 5

26. The electricity delivered by a hydroelectric power station is
    - A Alternating current at high voltage
    - B Direct current at high voltage
    - C Alternating current at low voltage
    - D Direct current at low voltage

27. How should an ammeter and voltmeter be connected to a resistor to verify Ohm's law ?
    - A All in series
    - B Ammeter in parallel and voltmeter in series
    - C Ammeter in series and voltmeter in parallel
    - D All in parallel

28. Two resistors of 15Ω and 10Ω are connected in parallel. The equivalent resistance is
    - A 1/6 Ω
    - B 12.5 Ω
    - C 6 Ω
    - D 25 Ω

29. The circuit in figure 6 shows a battery and four lamps. All the lamps are turned ON. If one lamp develops a fault and the others fail to light. Which lamp has developed the fault?

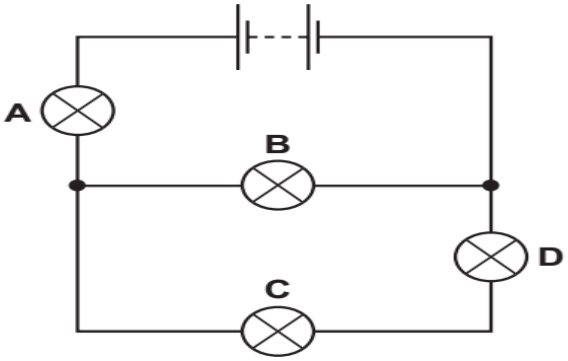

Figure 6

30. A desk lamp should have a 3A fuse fitted, but a 13 A fuse has been fitted by mistake. The lamp is not faulty.
The lamp is switched on. What happens?
    - A The fuse blows
    - B The fuse does not blow but the lamp does not light
    - C The lamp draws too much current and the supply cables could melt.
    - D The lamp works normally

31. Magnetic field lines of a bar magnet move from
    - A South pole to north pole
    - B South pole to south pole
    - C North pole to north pole
    - D North pole to south pole

32. Two iron nails hang from a bar magnet as shown in figure 7. Which diagram shows the magnetic poles induced in the nails ?

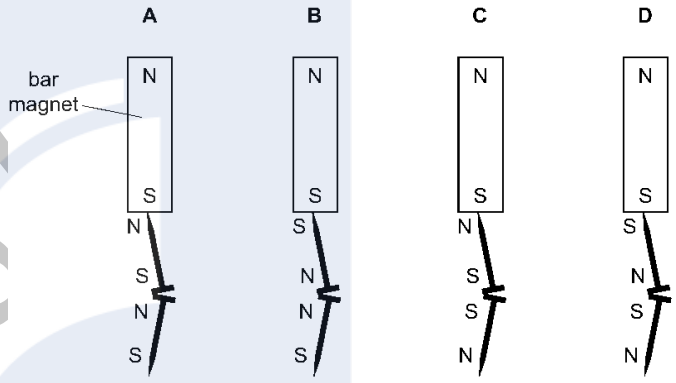

Figure 7

33. Two identical rods X and Y.

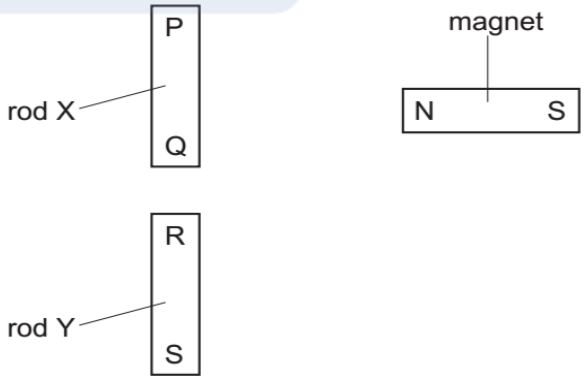

Figure 8

The N pole of a magnet is brought close to both ends of each rod. The results of these four actions are shown in the table.

end tested	result
P	attraction
Q	attraction
R	attraction
S	repulsion

Which of the rods is a magnet?
A none of the rods
B both of the rods
C rod X only
D rod Y only

34. Which law is used to determine the direction of the field around a straight current-carrying conductor ?
A Fleming's right hand rules
B Fleming's left hand rule
C Right-hand grip rule
D Lenz's law

35. A step down transformer has 1200 turns in the primary winding and 40 turns in the secondary winding. If the primary is connected to a 200V a.c. supply, the voltage across the secondary will be
A 6.1V
B 6.7V
C 24V
D 10V

36. The electronic symbol in figure 9 below represents :

Figure 9

A NOT gate
B AND gate
C OR gate
D NOR gate

37. A beam of cathode rays passes between two parallel metal plates connected to a high-voltage d.c. power supply as shown in figure 10. Which path does the beam follow?

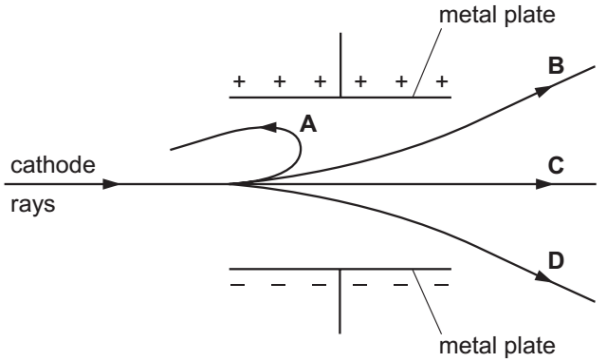

Figure 10

38. The amount of heat needed to raise the temperature of a substance by 1^0C is called its
A Latent heat of fusion
B Specific latent heat
C Specific heat capacity
D Heat capacity

39. One of the following will happen when a liquid is heated
A Volume increases
B Mass increases
C Density increases
D Temperature decreases

40. According to the kinetic theory of matter, the molecules of a gas at room temperature are
A Spread far and at rest
B Spread far apart and moving at random
C Closely packed and at rest
D Closely packed and vibrating

41. A wooden wheel in figure 11 can be strengthened by putting a tight circle of iron around it

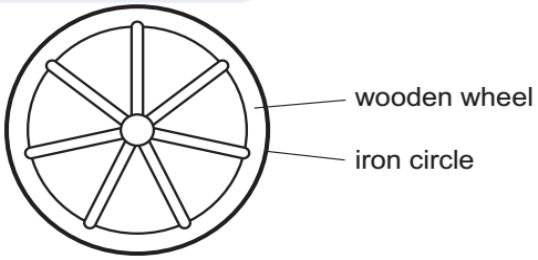

Figure 11

Which action would make it easier to fit the circle over the wood?
A cooling the iron circle
B heating the iron circle
C heating the wooden wheel
D cooling the wooden wheel

42. The particles that conduct electricity in an electrolyte are
A Electrons
B Molecules
C Ions

D Atoms

43. During electrolysis, electrons move from
A Anode to cathode
B Cathode to anode
C Cathode to electrolyte
D Anode to electrolyte

44. Two substances that must be present for rusting to occur are
A Oxygen and nitrogen
B Oxygen and water
C Water and carbondioxide
D Oxygen and carbondioxide

45. The number of neutrons in an atom with atomic number 17 and mass number 35 is
A 18
B 17
C 35
D 52

46. An incomplete equation is given
Dilute sulphuric acid + metal → salt + X
What is X ?
A Hydrogen
B Oxygen
C Sulphur dioxide
D Water

47. The diagram shows apparatus being used to fill a balloon with hydrogen.

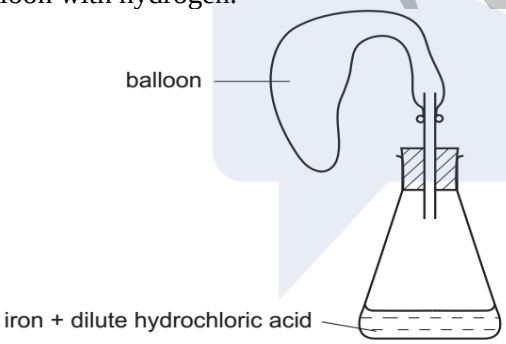

Figure 12

Which form of iron makes the balloon get filled most quickly?
A A lump of iron
B Pieces of iron wire
C Iron powder
D Thin sheets of iron

48. A student notices wounds on his lips after consuming unripe mangoes. What substance in the mango causes the burns?
A Base
B Acid
C Water
D Alkali

49. What will happen on earth if the ozone layer is destroyed ?
A More clouds will reach the earth
B More gases will flow into the atmosphere
C Much radiation will reach the earth
D More gases will escape the atmosphere

50.

Figure 13

The safety symbol shown in figure 13 means
A Radioactive
B Harmful
C Irritant
D Risk of electric shock