

CAPS

GRADE 7

Technology
Nov Controlled Term Test 2021

Marks: 60

Duration: 1 hour 30 Min

This question paper consists of 9 pages

Instructions

1. This paper consists out of **three** sections:

Section A	Technological Knowledge and understanding		15
Section B	Design skills and Graphic communication	Design Brief, Specification & Constraints	20
		Working drawing (Circuit Diagram)	10
Section C	Technology, Society and the Environment	Processing (Impact of Technology)	15
Grand total			60

2. All Sections A to C must be answered. (compulsory)
3. Do not answer on the question paper.
4. Number your question exactly as they appear in the question paper.
5. Start each **Section** at the top of a new page.
6. Write legibly and neatly.
7. If instructed to sketch, sketches must be clear, neat and done in pencil.

Section A:**Question 1**

Choose the correct answer and write only the letter (**A - D**) next of the question number. (**1.1 – 1.10**)

e.g. 1.6. g

1.1. In graphic communication, outliners are always

- A. thick and continuous
- B. thin and continuous
- C. faint and continuous
- D. all of the above

(1)

1.2. Which of the following represent first class lever?

- A. Fulcrum – Effort – Load
- B. Effort – Fulcrum – Load
- C. Fulcrum – Load – Effort
- D. Load – Effort - Fulcrum

(1)

1.3. The different frame structure and shell structure.

- A. Frame structure should be stronger than shell structure
- B. Shell structure break easily compared to frame structures
- C. Shell structure support from outside and the frame structure from inside
- D. Both the frame structure and the shell structure are forms of constructions that support the load

(1)

1.4. Which of these is an example of a specification that would be included in a design brief?

- A. You have three hours for a design brief?
- B. The crane must include a pulley and a crank mechanism.
- C. Take care when working with scissors.
- D. Work as part of a team.

(1)

1.5. A short circuit happens when ...

- A. the circuit is open
- B. bare wires touch
- C. there is a loose connection
- D. the circuit is closed

(1)

[05]

Question 2**True/False**

State whether the following are True or False.

- 2.1. Negative and positive terminals are connected together in the series cell to form a battery.
- 2.2. In magnets, like poles attract each other and unlike poles repel each other.
- 2.3. Recycling can be used to keep the environment clean.
- 2.4. Fire fighters wear clothes that are not fire resistant.
- 2.5. A pair of pliers is an example of second lever class.

[05]**Question 3**

Match statements in Column A with Column B. Write only the question number and the letter of the correct answer.

Column A	Column B
3.1. Controls the flow of current	A. Shell structure
3.2. An example of first-class lever	B. Bending force
3.3. A short statement that gives the general outline of a solution to the problem	C. Reuse
3.4. A brick wall is classified as a	D. Pair of scissor
3.5. Use a shopping basket for shopping instead of buying a shopping bag.	E. Design brief
	F. Switch
	G. recycle

[05]**Total Section A: 15**

Section B:**Design skills and Graphic communication****Question 4****Scenario****Mechanical System & Control**

4.1. Read the following extract and then answer the question that follow:

A scrap metal dealer near your school needs to sort magnetic (ferrous) metals and non-magnetic (non-ferrous) metal into separate piles for recycling. He has asked you to build a crane with an electromagnet to sort these metals.

You must build a working model of a crane with a crank and pulley system and an electromagnet. The crane must be a frame structure that is strong and rigid. It must be reinforced using triangulation, and must be able to carry the weight of the electromagnet and the metals that will cling to it. The crane must pivot or be able to raise and lower its arm. Use any bought metals, paper dowels, “elephant grass” or cardboard to build the crane. The electromagnet must be strong enough to pick up several steel paper clips, coins or nails. It must have an on and off switch, with a light to show when it is on. You must use four 1,5 V D cells, a switch, a 6.5V MES lamp, connectors, electrical wire, insulation tape, and a 150 mm nail and a long length of insulated copper wire to make the electromagnet. You also need staples or paperclips to demonstrate how the magnet works. You must construct the model using safe working methods. You will use your drawing skills and knowledge of structures, magnetism, electric circuits and electromagnets, cranks and pulleys (Clitheroe F., 2018, p. 129).

4.2. Use the information from the extract to write the design brief.

2.2.1. State what the problem is, and what you want to achieve? (2)

2.2.2. Explain who the solution will benefit. (1)

4.3. Use the word bank given to label the picture below.

Triangulation, pulley, load, broad base, arm/ jib, grooved wheel. Struts, bending force, torsion force, tension force.

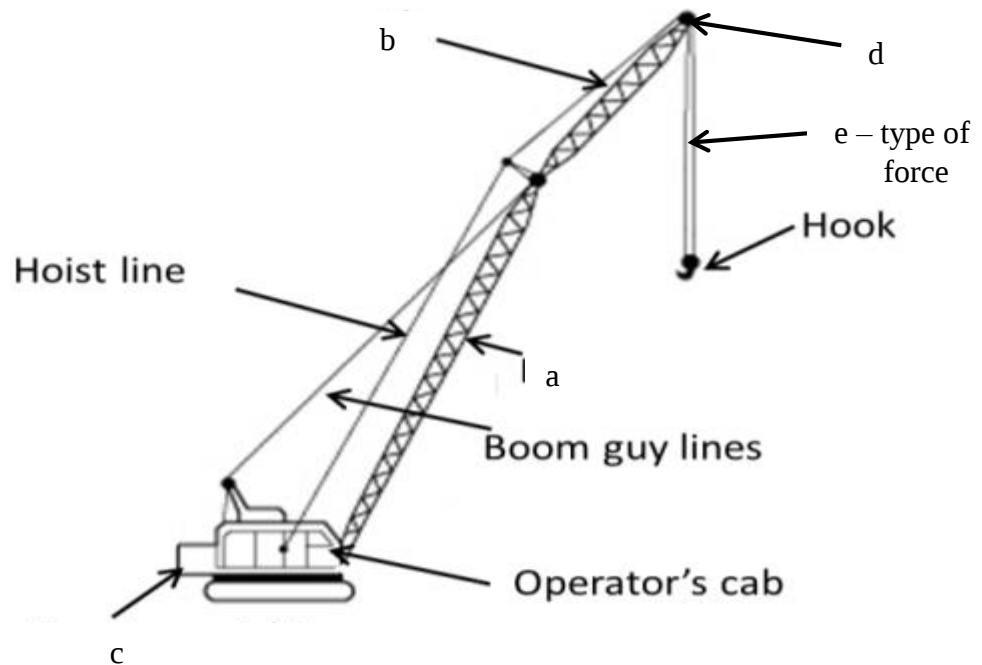


Figure 1: Crane model

4.4. Design specifications tell you what you must do, and what must be included in the solution.

Design Specification		
Criteria	Description	Mark
4.4.1. Fit for purpose	Do cranes make our lives easy motivate your answer.	(2)
4.4.2. Special features for the crane	Briefly explain why triangulation is used?	(3)
4.4.3. Reinforcement technique	Name and explain the two types of force that can act on the structure above.	(4)

4.5. Write your design constraints.

4.5.1. The electromagnet is supposed to pick certain type of metals. What type will it be able to pick and why? (3)

[20]

Question 5**Graphic communication****Circuit drawing.**

- 5.1. Draw the circuit diagram using the correct electrical symbols using the circuit drawing provided below. Your circuit must consist of two batteries, electromagnet, wire and open switch. (4)

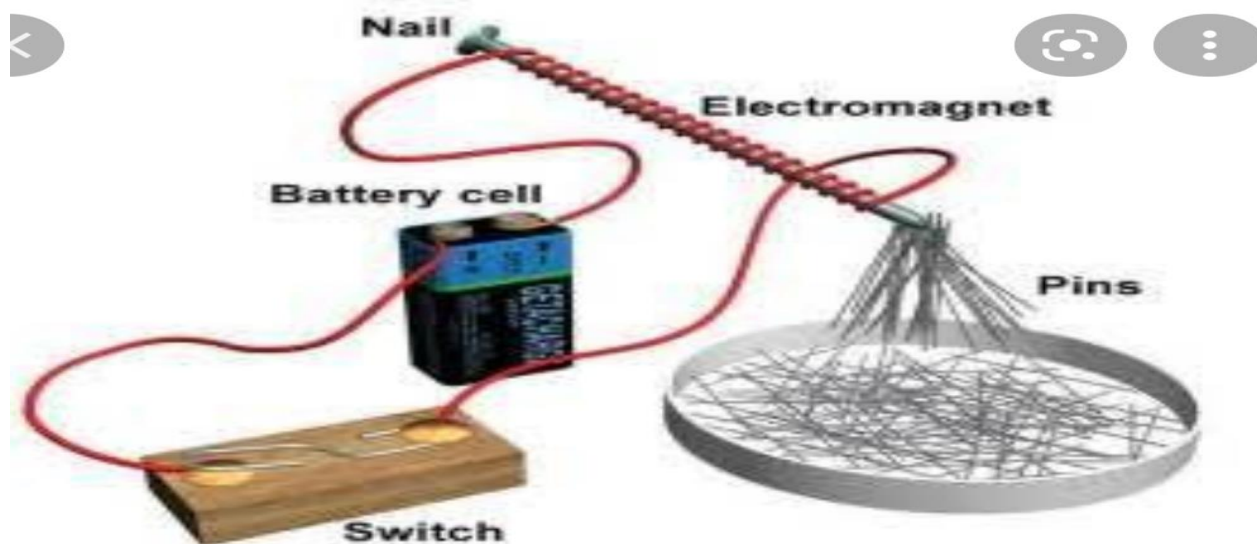


Figure 2: Circuit drawing

Circuit diagram Rubric

Skill	Description	Marks	
		Mark allocated	Mark obtained
Circuit diagram	Correct usage of electrical components Electromagnet, wires, two batteries connected in Series, open switch.	4	
		4	

- 5.2. Describe the function of the cell in the circuit. (2)

- 5.3. Define the following terms.

- 5.3.1. Conductors (2)

- 5.3.2. Insulator (2)

[10]

Total Section B: 30

Section C:**Technology, Society & the Environment****Question 7**

7.1. Read the case study below and then answer all the questions about it.



Figure 3: Rubbish Dump with waste that could be recycled

The process of collecting and reusing any material that we throw away is known as recycling. The most common materials that we recycle are paper, plastic, metals and glass.

Recycling is done with the aim of making sure that our environment remains clean, ensuring that our landfill sites are not full and also to make money.

Unfortunately, much of the good work that is done by people who recycle waste materials, is undermined actions of metal thieves. Because they can get a lot of money for metal, people steal metal items that are important and not ready for recycling – such as copper telephone wires and metal manhole covers.

Copper is used in electrical and telephone wires, so copper theft affects our economy because business can't operate effectively when these wires are stolen, and also that manholes that are not covered, pose serious risk to people, animals and motorists as they can easily fall into them and get injured or even die.

- 7.1. 1. What does the word 'recycling' means? (2)
- 7.1. 2. Why should we recycle waste products? List **THREE (3)** reasons. (6)

7.2. Look at the picture of a refugee camp shown below and answer all the questions.

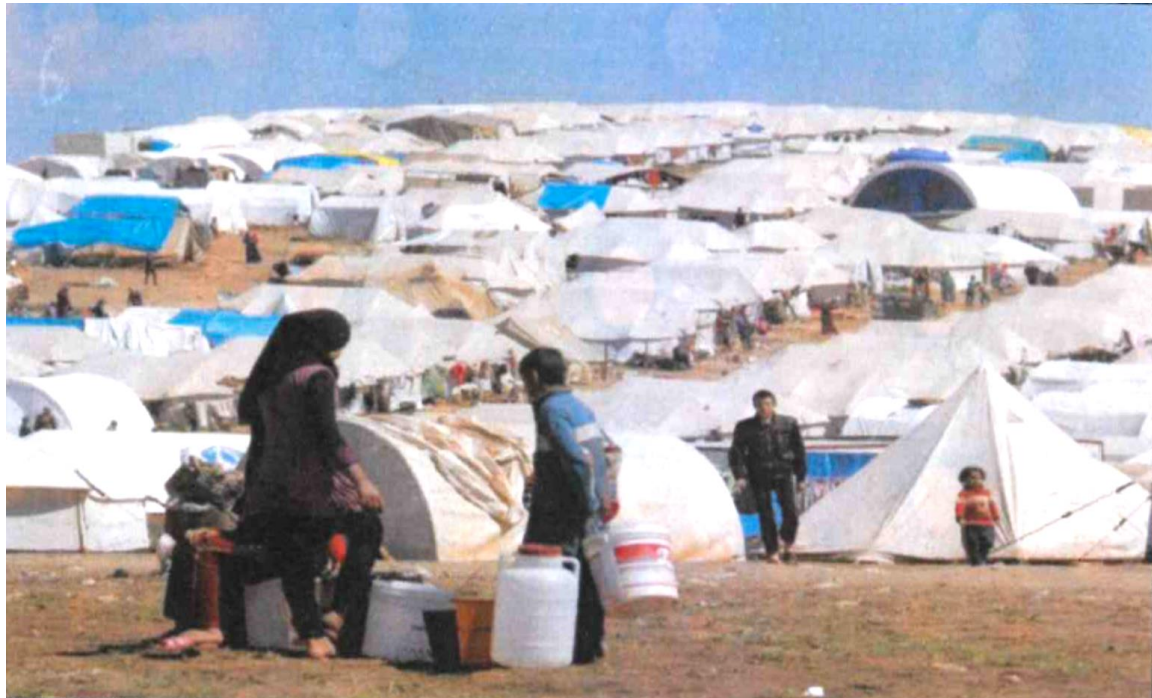


Figure 4: A refugee camp

- 7.2. 1. What do you understand by the term refugee? (2)
- 7.2. 2. Write down any **TWO (2)** reasons that may cause people to move or run away from their own country and to seek refuge in another country. (2)
- 7.2. 3. A business donated cows for the refugees to eat over a period of time. Since there is no electricity and fridges in the refugees to eat over a period of time. How would you help the refugees to keep the meat for longer period of time without rotting or spoil in hot summer days? (2)
- 7.2. 4. Why must tents in a refugee camp be made of certain type of material rather than normal ones? (1)
- [15]

Total Section C: 15

Grand Total: 60 marks