



Province of the
EASTERN CAPE
EDUCATION

SENIOR PHASE

GRADE 9

NOVEMBER 2013

**TECHNOLOGY
MEMORANDUM**

MARKS: 100

This memorandum consists of 9 pages.

INSTRUCTIONS AND INFORMATION

1. A learner must answer ALL the questions from SECTIONS A, B, C, D and E.
2. Sketches must be clear, neat and done in pencil.

ALLOCATION OF MARKS

SECTION A	MULTIPLE-CHOICE QUESTIONS		
	QUESTION 1		[15]
SECTION B	STRUCTURES		
	QUESTION 2		[20]
SECTION C	PROCESSING		
	QUESTION 3		[15]
SECTION D	SYSTEMS AND CONTROL (Mechanical Systems)		
	QUESTION 4		[25]
SECTION E	SYSTEMS AND CONTROL (Electrical Systems)		
	QUESTION 5	(18)	[25]
	QUESTION 6	(7)	

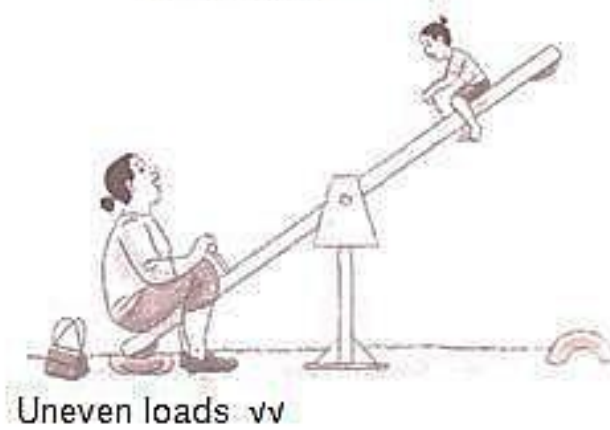
SECTION A: MULTIPLE-CHOICE QUESTIONS**QUESTION 1**

- | | | | |
|-----|--------|---|-----|
| 1.1 | 1.1.1 | C ✓ | (1) |
| | 1.1.2 | B ✓ | (1) |
| | 1.1.3 | A ✓ | (1) |
| | 1.1.4 | D ✓ | (1) |
| | 1.1.5 | A ✓ | (1) |
| | 1.1.6 | C ✓ | (1) |
| | 1.1.7 | B ✓ | (1) |
| | 1.1.8 | B ✓ | (1) |
| | 1.1.9 | B ✓ | (1) |
| | 1.1.10 | B ✓ | (1) |
| 1.2 | 1.2.1 | Drying ✓ | (1) |
| | 1.2.2 | dynamic ✓ | (1) |
| | 1.2.3 | Triangulation ✓ | (1) |
| | 1.2.4 | natural ✓ and synthetic (or man-made) ✓ | (2) |

TOTAL SECTION A: 15**SECTION B: STRUCTURES****QUESTION 2**

- | | | | |
|-----|-------|--|-----|
| 2.1 | 2.1.1 | To span a gap ✓
To shorten the distance to be travelled
Providing access for vehicles
Saving time and money | (1) |
| | 2.1.2 | Cables ✓ and wires ✓ | (2) |
| | 2.1.3 | Cables – tensile ✓
Pillars – compressive ✓ | (2) |
| | 2.1.4 | The natural environment is damaged through the construction of a bridge. ✓ | (1) |
| 2.2 | 2.2.1 | E ✓ | (1) |
| | 2.2.2 | D ✓ | (1) |
| | 2.2.3 | F ✓ | (1) |
| | 2.2.4 | A ✓ | (1) |
| | 2.2.5 | B ✓ | (1) |

2.3 2.3.1



(4)

2.3.2

STRUCTURAL COMPONENT		STIFF OR FLEXIBLE
A	Strut	Stiff ✓
B	Tie	Flexible ✓
C	Spring	Flexible ✓
D	Truss	Stiff ✓
E	Tent brace	Flexible ✓

(1)

(1)

(1)

(1)

(1)

TOTAL SECTION B: 20

SECTION C: PROCESSING**QUESTION 3**

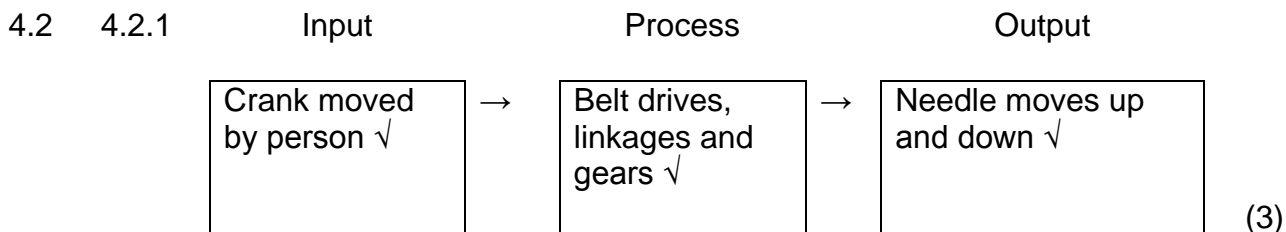
- 3.1 3.1.1 The armies who fought a long way from home needed to be fed. ✓ (1)
- 3.1.2 Heating food in sealed glass bottles. ✓
Sealing the food in an airtight container. ✓ (2)
- 3.1.3 Heating food at high temperatures kills micro-organisms. ✓/
Sealing the food in glass bottles removed air from around the food
which prevents micro-organisms from growing on the food. (1)
- 3.1.4 He developed a method of sealing food in tins rather than glass
bottles. ✓ (1)
- 3.1.5 Tins were lighter, unbreakable and easier to seal. ✓ (1)
- 3.1.6 The iron was coated with a fine layer of tin to stop it from rusting. ✓ (1)
- 3.2 3.2.1 E ✓ (1)
- 3.2.2 D ✓ (1)
- 3.2.3 A ✓ (1)
- 3.2.4 B ✓ (1)
- 3.2.5 F ✓ (1)
- 3.3 3.3.1 Electrolysis – Chemical decomposition produced by passing an
electric current through a conducting liquid. ✓ (1)
- 3.3.2 It keeps water and air away from the surface of the metal. ✓
Improves the appearance and lifespan of metal.
Resistance to corrosion.
(Any ONE of the above or any other acceptable answers.) (1)
- 3.3.3 The metal underneath will corrode. ✓ (1)

TOTAL SECTION C: 15

SECTION D: SYSTEMS AND CONTROL (MECHANICAL SYSTEMS)

QUESTION 4

4.1		OBJECT	TYPE OF MOVEMENT	
	4.1.1	An aeroplane	Linear movement ✓	(1)
	4.1.2	A person jumping on a trampoline	Reciprocating movement ✓	(1)
	4.1.3	A wheel	Rotating movement ✓	(1)
	4.1.4	A pendulum	Oscillating movement ✓	(1)



- 4.3 4.3.1 Hydraulic systems use hydraulic fluids such as oil or water confined in strong cylinders to create strong forces. A hydraulic system usually consists of a closed device with two pistons. Force applied to one piston results in the second piston moving. ✓ (1)
- 4.3.2 The scoop of a front-end loader ✓ and a car lift. ✓ (2)
- 4.3.3 Hydraulic systems need to have control mechanisms to allow us to direct the flow of fluid to our advantage. ✓ (1)
- 4.3.4 A car lift needs control mechanisms to keep the lift up, otherwise the lift would just keep falling down. ✓ (1)
- 4.4 4.4.1 A belt drive is a pulley system that is joined together by means of belts. ✓ (1)
- 4.4.2 Sewing machines ✓
Motor vehicles ✓ (2)

- 4.5 4.5.1 The load will drop to the ground and the crank handle will spin round in the wrong direction. ✓ (1)
- 4.5.2 By fitting in the ratchet and pawl mechanism to the crank. To jam the handle by tying it ✓ (1)
- 4.6 4.6.1 It is a compound gear system ✓ (1)
- 4.6.2 Gear Ratio = $\frac{\text{Output gear B}}{\text{Input gear A}} \times \frac{\text{Output gear D}}{\text{Input gear C}}$
 $= \frac{57}{19} \times \frac{57}{19} \checkmark$
 $= 9 \checkmark$
 The gear ratio is 9 : 1 or 1 : $\frac{1}{9}$ ✓ (3)
- 4.6.3 Shaft D will turn 9 times slower than Shaft A. ✓ (1)
- 4.7 4.7.1 The winch has a ratchet and pawl to prevent the cable unwinding from the drum when the handle is released. ✓ (1)
- 4.7.2 Pawl ✓ (1)
- 4.6.3 Ratchet and pawl ✓ (1)

TOTAL SECTION D: 25

SECTION E: SYSTEMS AND CONTROL (ELECTRICAL SYSTEMS)

QUESTION 5

5.1

5.1.1

Letter of component	Name of component	
A	Battery ✓	(1)
B	Switch ✓	(1)
C	Resistor ✓	(1)
D	Capacitor ✓	(1)
E	Transistor ✓	(1)

5.1.2

Letter of component	Name of component	Input, Process, Output
A	Battery	Input ✓
B	Switch	Input ✓
C	Resistor	Process ✓
D	Capacitor	Process ✓
E	Transistor	Process ✓

(1)

(1)

(1)

(1)

(1)

5.1.3 The Light Emitting Diodes (LED's) will flash. ✓ (1)

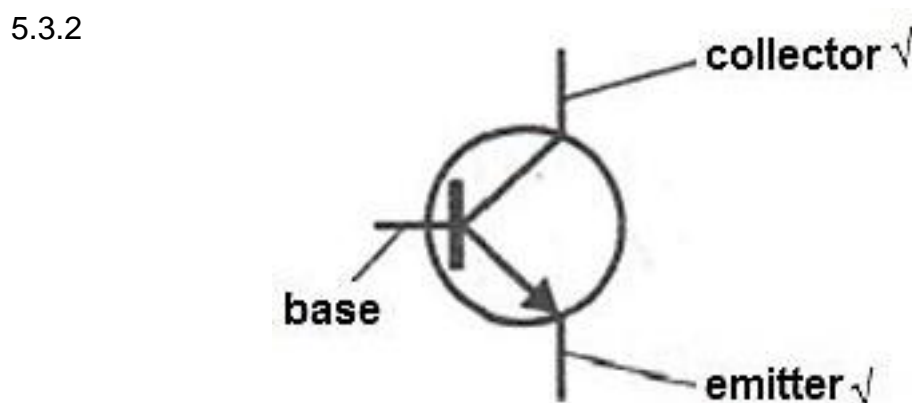
5.2 5.2.1 Light-Dependent Resistor (LDR) ✓ (1)

5.2.2 Its resistance increases. It has a high resistance when it is dark and a low resistance when the light shines. ✓ (1)



(2 marks for the drawing of the symbol) (2)

5.3 5.3.1 A transistor amplifies electronic current. It turns currents on and off. ✓ (1)



(2)
[18]

QUESTION 6

- | | | | |
|-----|-------|---|-----|
| 6.1 | 6.1.1 | Blue in the 1 st band = 6 ✓
Grey in the 2 nd band = 8 ✓
Red in the 3 rd = 00 ✓
= 6 800 Ω

(one mark for 6, one mark for 8 and one mark for 000) | (3) |
| | 6.1.2 | Resistors ensure that there is a flow of current in an electronic circuit. They deliberately slow or stop the flow of current. ✓ | (1) |
| 6.2 | 6.2.1 | 1 st band 5 = Green ✓
2 nd band 0 = Black ✓
3 rd band Nil = Black ✓ | (3) |

[7]

TOTAL SECTION E:	25
GRAND TOTAL:	100