Component 3 - External exam

Supervised hours: 2 hours | Paper Reference **21141K**

Engineering

Component 3: Responding to an Engineering Brief
Set Task: Part 1

Morning
(Supervised hours: 1 hour 30 minutes) | Paper Reference **21141K**

Engineering

Component 3: Responding to an Engineering Brief
Set Task: Part 2 Task and Answer Booklet

You must have:
HB or B pencil, eraser, drawing instruments and calculator

Part 1	Marks	Time
Practical and recording results.		You should spend **45 minutes** carrying out your practical activity and recording results in the tables for Activity 1a.
Activity 1a – Results and observations	6 marks	You should spend **15 minutes** completing your observations for Activity 1a
Activity 1b – Processing results	8 marks	20 minutes
Activity 1c – Conclusions	8 marks	20 minutes
Activity 1d – Evaluation	8 marks	20 minutes
Part 2	Marks	Time
Activity 2a – Evaluation	8 marks	2o minutes
Activity 2b – Redesign and justify	10 marks	30 minutes
Activity 3 – Drawing conclusions	12 marks	40 minutes

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Engineering

Component 3: Responding to an Engineering Brief
Set Task: Part 1

Keywords

Patterns
Trends
Reliable
Measuring
Precision

Data
Equipment
Labelled
Gradient
Solutions
accurate

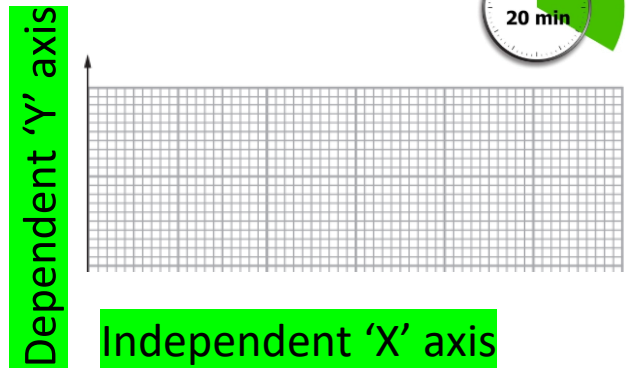
Part 1	Marks	Time
Practical and recording results.		**30 mins**
Activity 1a – Results and observations	6 marks	**15 mins**
Activity 1b – Processing results	8 marks	20 min
Activity 1c – Conclusions	8 marks	20 mins
Activity 1d – Evaluation	8 marks	20 mins

Activity 1a: Recording results and observations from your tests

- The table will be populated with 8 equally spaced values for the loads placed on the load carrier.
- The units of Degrees (◦) and Seconds (S) will be added, either to the column heading or the individual values recorded.
- The release angles will be the same in each table.
- The times recorded will "reasonable" for the release angles.
- Descriptions will be offered about three different aspects of the testing process that the learner noted.
- Comments offered by the learner will focus on the testing process.

Activity 1b: Processing results

- ✓ Labelled with units
- ✓ Title
- ✓ Majority of space used
- ✓ Plotted accurately
- ✓ Line of best fit



Activity 1c: Drawing conclusions

- ✓ Patterns in tables or graphs, Anomalies
- ✓ Comment on positive correlation
- ✓ Max and min points data points
- ✓ Calculations made to show the approx. increase
- ✓ Gradients of the lines
- ✓ EVIDENCE from the table/graphs links to the scenario, which would be the best to use
- ✓ Quality of the data

Activity 1d: Evaluation

- ✓ Any problems commented on/solutions offered
- ✓ Solutions about several different problems whilst testing
- ✓ Reasons and causes
- ✓ Specific solutions suggested
- ✓ Generic solution e.g. repeat the test to obtain average

Component 3 – Part 1

Activity 2a – Evaluation – (8 marks)

Problems will be identified

Methods


Materials


Manufacture

- excessive waste
- excessive time
- generic problems
- possibility of errors
- poor quality

Activity 2b – Re-design (10 marks)

- **annotated** drawing
- different **views**
- indicate the **sizes** of keys features
- the idea will include **solutions**
- notes will explain this **features**

- design features will be added to improve the **performance**

- more **efficient** method of **manufacture**
- **advantages** of the proposed new **process**

- method will be **appropriate** to the **suggested material**

Activity 3 – Drawing conclusions (12 marks)

- The increase in ?
- The decrease in?
- Anomalies?
- within tolerance?

- **Valid reasons** that could cause the **patterns** noted in the data
- Drill(tool) bit wear
- operator fatigue
- potential errors with measurements

- A **consequence** of the….
- increased costs,
- production delays
- waste

- **Valid suggestions** about how to **eliminate** the causes
- different speeds/ feed rates
- Coolant
- better quality drill bits
- improved operator skill
- go no/go gauges to measure

Component 3 – Part 2