OCR
Oxford Cambridge and RSA

Level 3 Cambridge Technical in Engineering
05873
Unit 24: Project management for engineers
Friday 19 January 2018 – Morning
Time allowed: 2 hours

You must have:
- a calculator

First Name						Last Name					
Centre Number						Candidate Number					
Date of Birth	D	D	M	M	Y	Y	Y	Y			

INSTRUCTIONS
- Use black ink. You may use an HB pencil for graphs and diagrams.
- Complete the boxes above with your name, centre number, candidate number and date of birth.
- Answer **all** the questions.
- Write your answer to each question in the space provided. If additional answer space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.

INFORMATION
- The total mark for this paper is **80** .
- The marks for each question are shown in brackets **[ ]**.
- This document consists of **20** pages.

FOR EXAMINER USE ONLY	
Question No	**Mark**
1	/20
2	/20
3	/23
4	/17
Total	**/80**

Answer **all** the questions.

Text 1

Curtess Carbonate plc is a large, multinational company manufacturing fizzy drinks at production sites in China, Germany, Turkey and the UK. Each of these production sites has an output of over 75 000 litres per day. Bottles and cans of Curtess Carbonate branded drinks are sold worldwide, and in the last few years its drinks have become so popular that the business is struggling to keep up with demand.

Operations Director, Jacqui Mulhern, is based at the Curtess Carbonate plc headquarters in the UK.

Jacqui has two main concerns:

- that production methods are becoming outdated, and
- that output cannot easily be increased.

She believes that a technological upgrade across all four production sites is needed if Curtess Carbonate plc is to meet future demand. A technological upgrade should also improve manufacturing efficiency to help the company compete with its rival, Watson Drinks plc, the market leader.

Curtess Carbonate plc has initiated a formal project to upgrade the technology at all four of its production sites. Jacqui Mulhern is the project sponsor. Tom Smith, a skilled engineer who has worked at the company for three years, has been assigned as project manager. This will be the second project which Tom has managed for the company, but the first that has required him to co-ordinate a project management team based across several countries.

Tom realises that the scale of this project, and its importance to the company, will be a major challenge. Being geographically diverse, with cross-cultural differences, and its need for international communications, the technological upgrade will be far more demanding than his first project. In addition, Tom will need to manage an external contractor, as the skills required to deliver the technology upgrade are not available in-house.

Feedback on the way Tom managed his first project for the company suggests that he needs to improve in two ways; first, the way he manages risk within a project and second, how he monitors a project. Tom is eager to do well and to learn from the mistakes he made in his first project.

The project has been allocated a budget of £80 million, and given a timescale of two years. It has also been set a target to increase total company output by at least 25%.

1 Refer to Text 1.

(a) State **three** responsibilities of the project sponsor, Jacqui Mulhern.

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[3]

(b) Feedback from Tom's first project suggests he needs to improve the way he manages risk within a project.

(i) Outline **one** difference between objective feedback and subjective feedback.

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(ii) State **three** pieces of information which Tom should include in the risk analysis section of the project plan.

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(c) Evaluate the most important skills that Tom needs, to manage this project effectively.

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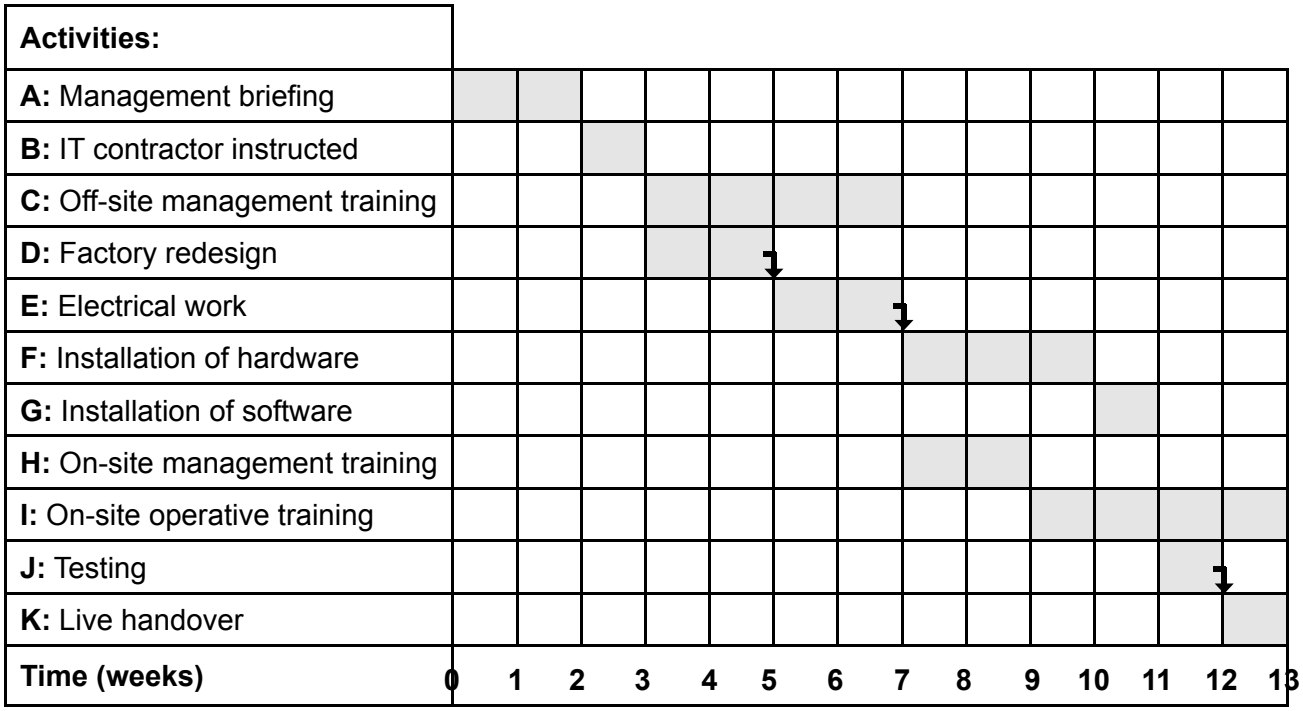
Text 2

After extensive research Tom appoints a specialist information technology (IT) contractor, TKT Systems Ltd, to upgrade the IT for Curtess Carbonate plc. The specialist contractor spends six months designing a bespoke solution for the company. The hardware and software will be installed at each of the four production sites in turn.

Knowing that his project monitoring skills need to be improved, Tom decides to manage this part of the project carefully.

Tom decides to use a Gantt chart and critical path analysis to monitor the project at each site. He is very aware that a change in any external factor may have a negative effect on the outcome of the project.

A Gantt chart for Curtess Carbonate plc, showing the activities involved in the technological upgrade at each production site, is shown below.



2 Refer to Text 2.

(a) Curtess Carbonate plc has appointed a specialist IT contractor, TKT Systems Ltd, to upgrade its four production sites.

What is meant by the term 'contractor'?

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.....**[1]**

(b) Refer to the Gantt chart for Curtess Carbonate plc.

(i) Which activity is expected to take three weeks?

.....**[1]**

(ii) Which activity is directly dependent on the completion of Activity D: Factory redesign?

.....**[1]**

(iii) On which other activity is Activity G: Installation of software, dependent?

.....**[1]**

(iv) Which activity is concurrent with Activity E: Electrical work?

.....**[1]**

(v) If all goes to schedule, how long should the entire process take, from management briefing to live handover?

.....**[1]**

(vi) What impact would there be on the duration of the entire process, from management briefing to live handover, if Activity C: Off-site management training, only takes three weeks?

.....**[1]**

(vii) Calculate the shortest amount of time for the entire process, from management briefing to live handover, if Activity J: Testing, takes one week longer than forecast.

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.....**[1]**

(c) Explain **one** benefit to Tom of using critical path analysis to help monitor the project.

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(d) Explain **two** external factors which could negatively affect the outcome of the project.

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(e) Other than using a Gantt chart and critical path analysis, analyse **two** ways the project could be monitored.

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Text 3

All four of Curtess Carbonate plc's production sites have now been upgraded.

The production site in China, has been using the new technology for just over a month.

Tom is keen to find out how successful the upgrade has been for the overall business and to find out what further actions may be necessary.

Tom intends to use quantitative data to make two specific comparisons.

Comparison One:

Tom finds some data on the internet site of Watson Drinks plc, the market leader. The article, dated 2014, boasts about Watson Drinks plc's environmentally friendly profile and low wastage rates. Tom intends to compare this data to the output and wastage levels of Curtess Carbonate plc, now that all production sites have been upgraded.

	Average wastage per day (in litres)	**Average output per day (in litres)**
Curtess Carbonate plc	11 049	368 300
Watson Drinks plc	19 335	1 289 000

Comparison Two:

Entries in the issue logs show that there were some initial problems following the technological upgrade at all four sites.

Tom wants to compare the percentage change in output at each of the four sites with the project target of increasing total company output by at least 25%.

Production site	**Average output per day before the upgrade (in litres)**	**Average output per day after the upgrade (in litres)**
China	80 000	92 000
Germany	82 000	106 600
Turkey	76 000	72 200
UK	78 000	97 500

3 Refer to Text 3.

(a) Refer to **Comparison One**.

(i) In the table below, circle the type of research and the source of information that Tom has used to obtain the data on Watson Drinks plc.

You should only draw **two** circles.

Type of research	Primary	Secondary
Source of information	Internal	External

[2]

(ii) Compare the wastage rate of Curtess Carbonate plc with the wastage rate of Watson Drinks plc, the market leader.

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(iii) Jacqui Mulhern, the Project Sponsor, is concerned about the validity of the data on Watson Drinks plc that Tom has selected for comparison with Curtess Carbonate plc's wastage rate.

Explain **three** reasons why the data on Watson Drinks plc may be invalid for this comparison.

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[6]

(b) Refer to **Comparison Two**.

(i) Explain why completing issue logs is an important part of effective project management.

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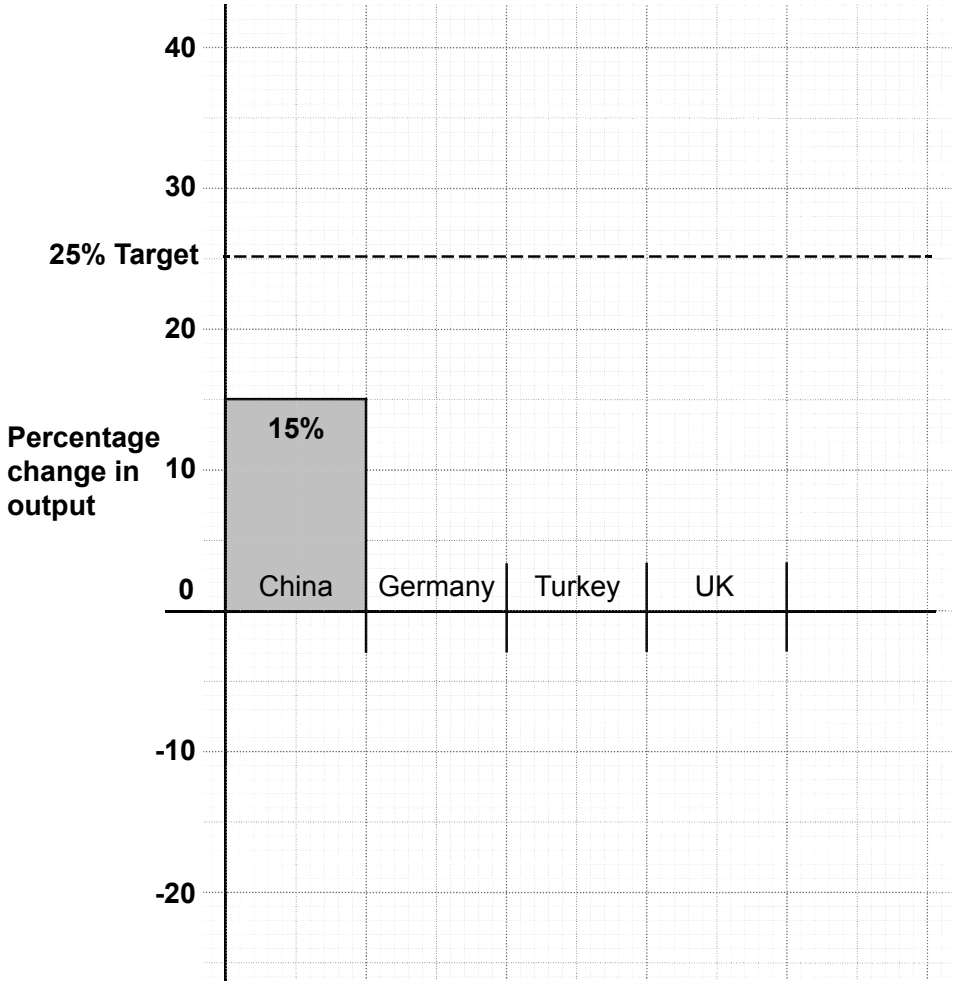
(ii) Complete the chart below to show the percentage change in output for each of Curtess Carbonate plc's four production sites following the technology upgrade.

China has been completed for you.

Curtess Carbonate plc production sites
Percentage change in output following the technology upgrade



[6]

You may use this box for your workings.

(iii) Explain **two** actions that Tom could take to improve the performance of the production site in China.

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[4]

Text 4

Despite some time creep, the project is now at the project closure stage.

The project has come in with an £85 million budget spend and current figures now show an overall 23% increase in output.

Tom has scheduled a formal meeting with management at each of Curtess Carbonate plc's four production sites to obtain further feedback on the project.

Tom intends to provide detailed feedback to all relevant stakeholders, including TKT Systems Ltd.

4 Refer to Text 4.

(a) Tom has scheduled a formal meeting with employees at each production site to obtain feedback on the success of the project.

Explain **one** benefit and **one** limitation of using a formal meeting to obtain the feedback.

Benefit .....

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Limitation .....

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[4]

(b) Tom has also arranged a meeting with TKT Systems Ltd, the IT contractor.

Explain **three** benefits to TKT Systems Ltd, of receiving feedback on its performance.

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[6]

(c) Other than obtaining feedback, state **three** tasks which Tom needs to complete during project closure.

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[3]

(d) Tom wants to improve stakeholder satisfaction in the next project he manages.
Explain **two** project controls Tom could put in place.

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[4]

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional answer space is required, you should use the following lined page(s). The question number(s) must be clearly shown – for example 1(a) or 2(b).

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