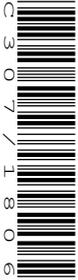


**OCR**

Oxford Cambridge and RSA

**Level 3 Cambridge Technical in Engineering  
05873****Unit 24: Project management for engineers****Friday 8 June 2018 – Afternoon****Duration: 2 hours****C307/1806****You must have:**

- a calculator

First Name

Last Name

Centre  
NumberCandidate  
NumberDate 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	/22
2	/18
3	/20
4	/20
<b>Total</b>	<b>/80</b>

Answer **all** the questions.

### Text 1

Lavin plc manufactures a range of large household appliances, including washing machines, tumble dryers, fridges, freezers and cookers. The company's workforce exceeds 4000. 2400 employees are located at its headquarters and primary production facility in the UK; the remainder are based at its secondary production facility in Spain.

Established for over 20 years, Lavin plc has developed a strong brand with a reputation for product reliability, durability and excellent customer service. The company takes customer opinions very seriously and, consequently, customer brand loyalty is high.

The company's five directors have a strong social conscience and insist on a robust corporate social responsibility policy. The company aims, not only to provide a satisfactory return to shareholders, but to be trusted by society, respected for upholding human rights and valued for its social contribution and environmental preservation. The company is known for its humanitarian charity work overseas, its commitment to innovation and to the better use of the world's resources.

The company made over two million branded appliances last year and appears to be doing well. However, careful analysis of the figures shows that since 2016 sales of its washing machines have been falling. This is of considerable concern to the company because its range of washing machines has always been its best seller, accounting for more than 30% of sales revenue.

Lavin plc has initiated a formal project to investigate the reasons for the fall in popularity of the company's washing machines and, if possible, to take appropriate action to rectify the situation. The company's five directors comprise the project steering committee.

Sitar Sandev, a skilled engineer, has been assigned as project manager. Sitar has managed several of Lavin plc's projects during the 10 years she has worked for the company. She has been chosen to lead this project because of her excellent planning and information management skills.

Sitar understands the urgency and importance of this project to the company. She has already produced an itemised resource plan and a detailed financial plan for the project. She is now conducting a stakeholder analysis, starting with a graph which shows stakeholders in the project according to their levels of interest and power (see **Fig. 1** on page 4).

1 Refer to Text 1.

(a) State **two** responsibilities of a project steering committee.

1 .....

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2 .....

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[2]

(b) State **three** types of resources which Sitar should have included in the resource plan.

1 .....

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2 .....

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3 .....

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[3]

(c) State **two** pieces of information which Sitar should have included in the financial plan.  
In each case, give a reason why it should be included.

1 .....

Reason .....

.....

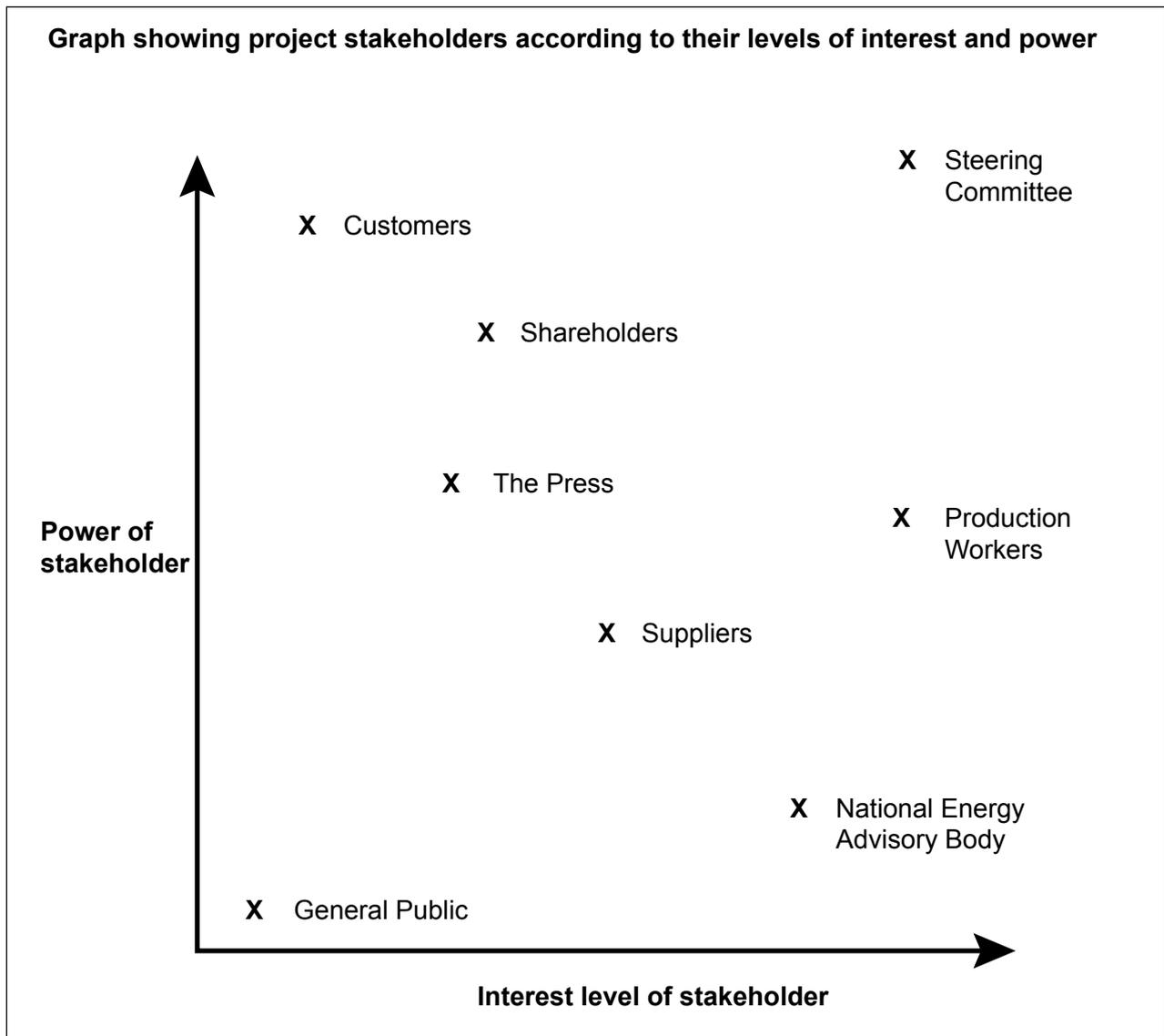
2 .....

Reason .....

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[4]

- (d) Sitar has produced a graph which represents project stakeholders according to their different levels of interest and power, see **Fig. 1**.



**Fig. 1**

- (i) What is meant by the term 'stakeholder'?

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**Turn over for the next question**

**Text 2**

The reasons for the fall in sales of the company's washing machines needs to be investigated. The research phase of the project will require a lot of data to be analysed.

Sitar decides to begin with an analysis of washing machine-related complaints received over the last five years. She requests that complaints are grouped by type. The data is processed in batches of 1000 complaints, the current batch is shown in **Table 1**, below.

**Table 1**

<b>Issues</b>	<b>Quantity</b>
<b>Issues raised in after-sales service logs:</b>	
Washing machine burst into flames	8
Washing machine not heating the water	70
Spin cycle not working	45
Washing machine not cleaning the clothes properly	20
Machine very noisy during spin cycle	85
<b>Issues handled by the company helpline:</b>	
Washing machine set on fire	6
Washing machine dented on delivery	142
Washing machine vibrates a lot and is very noisy	70
Washing machine giving electric shocks	8
Power consumption is too high	62
Controls too difficult to operate	15
<b>Issues raised on social media:</b>	
Washing machine arrived scratched	160
Clothes come out dripping wet	77
Uses too much water	32
Machine is not fully cleaning clothes	62
Machine vibrates too much	44
Poor customer service	46
Electricity consumption is too high	48
<b>Total:</b>	<b>1000</b>

**2 Refer to Text 2.**

(a) Sitar wants the complaints data grouped by type of complaint.

Using data from **Table 1**, complete the table below to show the number of each type of complaint received by the company.

Type of complaint	Number of complaints
Aesthetic damage	
Safety concerns	
Machine not working properly	
Poor energy/water efficiency	
Unacceptable noise/vibration	
Other	
<b>Total</b>	<b>1000</b>

[6]

(b) Explain **two** concerns that Sitar might have about drawing conclusions solely from the complaints data.

1 .....

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2 .....

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[4]

(c) Sitar tells the steering committee that she wants to collect further feedback from the end-users of the company's washing machines.

(i) Explain **one** reason why Lavin plc needs to take into account feedback from the end-users of its washing machines.

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[2]

(ii) State **two** primary research methods which Lavin plc could use to obtain feedback from end-users. In each case, give an advantage and a disadvantage of the method.

1 .....

Advantage .....

.....

Disadvantage .....

.....

2 .....

Advantage .....

.....

Disadvantage .....

.....

[6]

**Text 3**

Analysis of all company data, and further extensive research, reveals that there are two main reasons for the fall in sales of Lavin plc's washing machines:

- poor service from its outgoing logistics partner, and
- the use of low quality components.

Sitar produces detailed plans to correct the two issues identified.

A summary of the various steps involved in correcting the situation at Lavin plc is given in **Table 2**, below.

**Table 2**

<b>Activity</b>	<b>Description</b>	<b>Duration (weeks)</b>
A	Bring outgoing logistics in-house	24
B	Test in-house outgoing logistics	14
C	Agree improved component specifications	5
D	Find alternative component suppliers	17
E	Offsite manufacture of retrofit components	4
F	Delivery of retrofit components	2
G	Offsite manufacture of new-build components	36
H	Delivery of new-build components	1
I	Develop new quality control systems	8
J	Test new quality control systems	20
K	Test new production line	15

Sitar intends to use critical path analysis to monitor this part of the project.

3 Refer to Text 3.

(a) In the table below, identify with a tick (✓) the type of information shown in the column 'Duration (weeks)' in **Table 2**.

<b>Type of information:</b>	Qualitative	<input type="checkbox"/>	Quantitative	<input type="checkbox"/>
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[1]

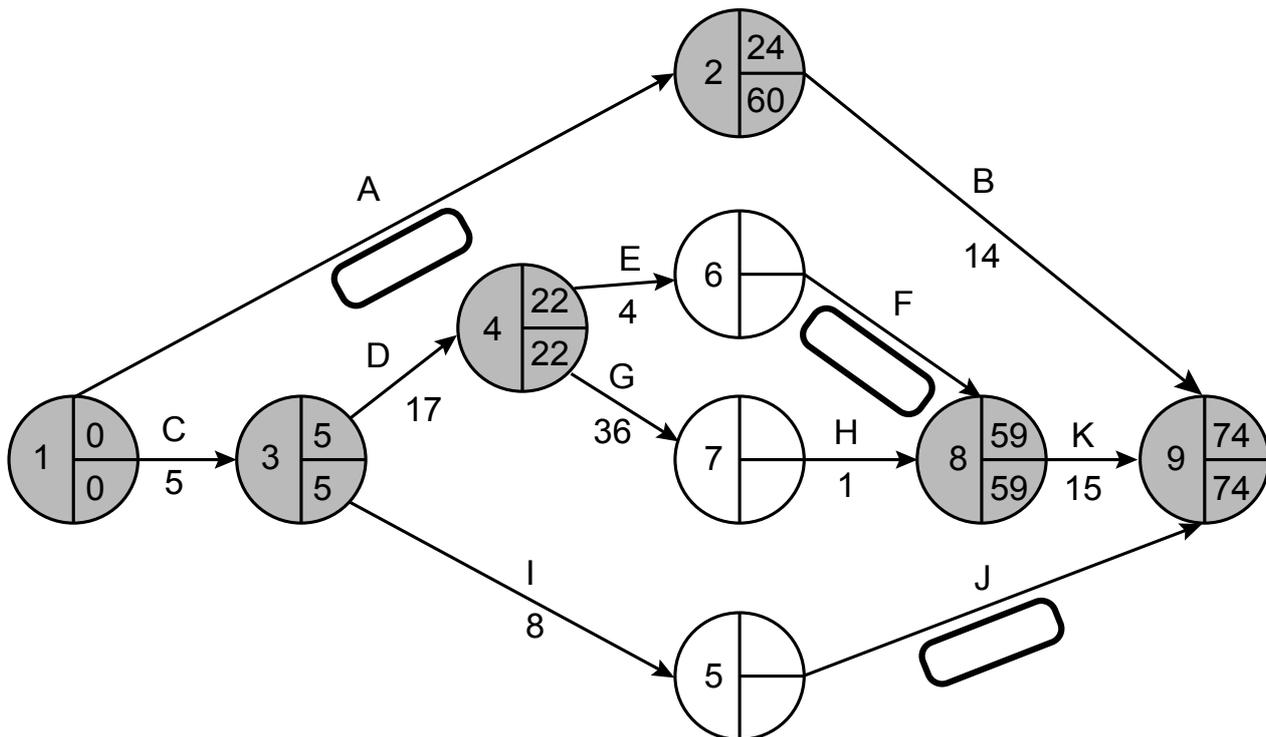
(b) (i) Using the information in **Table 2**, insert the durations of activities A, F and J into the critical path network diagram below.

[3]

(ii) Complete the critical path network diagram below by inserting the EST (earliest start times) and LFT (latest finish times) for nodes 5, 6 and 7.

[6]

**Critical path network diagram for the rectification phase of the project**



(c) Explain how critical path analysis can be used to monitor the project.

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..... [3]

(d) Explain **one** advantage to Sitar if she had chosen to use PERT, rather than critical path analysis, to monitor the project.

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..... [2]

(e) The delivery of a retrofit safety cut-out component, from a new supplier, is scheduled for tomorrow. Payment is due to be made to this supplier in seven days. Sitar has just heard that the delivery will be delayed by three weeks.

Explain what action Sitar should take.

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..... [3]

(f) Explain **one** likely consequence to the success of the project if Sitar did not have good information management skills.

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..... [2]

**Text 4**

Sitar continued to monitor the project closely through to its completion. The project completed on time, a little over budget. Feedback on stakeholder satisfaction indicates that not all stakeholders are as satisfied with the outcomes of the project as Sitar had hoped.

Before writing the final project report, Sitar intends to give feedback to Lavin plc's end-users who took part in the project. She also wants to gain feedback on her own performance during the project.

**4 Refer to Text 4.**

(a) Project outcomes can be affected by internal factors.

(i) Explain how Lavin plc's corporate social responsibility policy may have affected the outcomes of the project.

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.....[3]

(ii) Other than Lavin plc's organisational policies, state **three** internal factors which may have affected the outcomes of the project.

1 .....  
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2 .....  
.....  
3 .....  
.....  
.....[3]

(b) State **two** benefits to Lavin plc's end-users of receiving feedback at the end of the project.

1 .....

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2 .....

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[2]

(c) Sitar wishes to gather subjective feedback from project team members on her own performance as project manager.

(i) Analyse **one** formal and **one** informal method which Sitar could use to obtain subjective feedback from project team members.

Formal method .....

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Informal method .....

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[6]

- (ii) The feedback from project team members indicates that Sitar needs to improve her team building skills.

Describe **two** ways Sitar could improve her team building skills.

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2 .....

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[4]

- (d) Explain **one** way in which the project steering committee may be able to use the final project report to drive business improvement at Lavin plc.

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[2]

**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(d) or 4(b).

A large rectangular area with a solid vertical line on the left side and horizontal dotted lines across the page, providing space for writing answers.

A large rectangular area with a solid vertical line on the left side and horizontal dotted lines extending across the page, providing a template for writing.



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