

Cambridge Technicals

Engineering

Unit 24: Project management for engineers

Level 3 Cambridge Technical Certificate/Diploma in Engineering
05873

Mark Scheme for June 2025

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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MARKING INSTRUCTIONS

PREPARATION FOR MARKING

RM ASSESSOR

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *RM Assessor Online Training: OCR Essential Guide to Marking*.
2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are available in RM Assessor
3. Log-in to RM Assessor and mark the **required number** of practice responses (“scripts”) and the **required number** of standardisation responses.

MARKING

1. Mark strictly to the mark scheme.
2. Marks awarded must relate directly to the marking criteria.
3. The schedule of dates is very important. It is essential that you meet the RM Assessor 50% and 100% deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.
4. If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone, email or via the RM Assessor messaging system.

5. **Crossed-Out Responses**

Where a candidate has crossed out a response and provided a clear alternative then the crossed-out response is not marked. Where no alternative response has been provided, examiners may give candidates the benefit of the doubt and mark the crossed-out response where legible.

Multiple-Choice Question Responses

When a multiple-choice question has only a single, correct response and a candidate provides two responses (even if one of these responses is correct), then no mark should be awarded (as it is not possible to determine which was the first response selected by the candidate).

When a question requires candidates to select more than one option/multiple options, then local marking arrangements need to ensure consistency of approach.

Contradictory Responses

When a candidate provides contradictory responses, then no mark should be awarded, even if one of the answers is correct.

Short Answer Questions (requiring only a list by way of a response, usually worth only one mark per response)

Where candidates are required to provide a set number of short answer responses then only the set number of responses should be marked. The response space should be marked from left to right on each line and then line by line until the required number of responses have been considered. The remaining responses should not then be marked. Examiners will have to apply judgement as to whether a 'second response' on a line is a development of the 'first response', rather than a separate, discrete response. *(The underlying assumption is that the candidate is attempting to hedge their bets and therefore getting undue benefit rather than engaging with the question and giving the most relevant/correct responses.)*

Short Answer Questions (requiring a more developed response, worth two or more marks)

If the candidates are required to provide a description of, say, three items or factors and four items or factors are provided, then mark on a similar basis – that is downwards (as it is unlikely in this situation that a candidate will provide more than one response in each section of the response space).

Longer Answer Questions (requiring a developed response)

Where candidates have provided two (or more) responses to a medium or high tariff question which only required a single (developed) response and not crossed out the first response, then only the first response should be marked. Examiners will need to apply professional judgement as to whether the second (or a subsequent) response is a 'new start' or simply a poorly expressed continuation of the first response.

6. Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there, then add the annotation 'SEEN' to confirm that the work has been seen and mark any responses using the annotations in section 11.

7. There is a NR (**No Response**) option. Award NR (No Response):

- if there is nothing written at all in the answer space
- OR if there is a comment which does not in any way relate to the question (e.g., 'can't do', 'don't know')
- OR if there is a mark (e.g., a dash, a question mark) which is not an attempt at the question.

Note: Award 0 marks – for an attempt that earns no credit (including copying out the question).

8. The RM Assessor **comments box** is used by your Team Leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**

9. Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

10. For answers marked by levels of response: Not applicable in F501

To determine the level – start at the highest level and work down until you reach the level that matches the answer

To determine the mark within the level, consider the following

Descriptor	Award mark
On the borderline of this level and the one below	At bottom of level
Just enough achievement on balance for this level	Above bottom and either below middle or at middle of level (depending on number of marks available)
Meets the criteria but with some slight inconsistency	Above middle and either below top of level or at middle of level (depending on number of marks available)
Consistently meets the criteria for this level	At top of level

11. Annotations

Annotation	Meaning
	Valid point, mark awarded
	Incorrect
	Response unclear
BOD	Benefit of doubt (mark awarded)
TV	Too vague (mark not awarded)
REP	Repetition (no additional marks awarded)
L1	Level 1 response (identification)
L2	Level 2 response (explanation)
L3	Level 3 response (analysis)
L4	Level 4 response (evaluation)
CONT	Context (required for high L4 award only)
NAQ	Not answered question
BP	Blank page
SEEN	Noted but no credit given
OFR	Own figure rule
TE	Transcription error

12. Subject-specific marking instructions

For Level of Response marked questions marked over 4 levels, the candidate can access at L1 or L2. In either case, they can analyse the point made and proceed directly to L3.

L3 analysis is required before L4 can be accessed.

Question			Answer	Marks	Guidance
1	(a)		Indicative content: Running the project on a day-to-day basis.	1	One mark for a correct identification. Contradictory response rule applies (see preamble item 5) i.e., if two items are ticked, award zero.
1	(b)		Responses include: - Overspending - Costs more than planned - Spend more than expected	1	One mark for a correct identification. Must be clearly financial, look for terms such as 'money', 'spend', 'cost', etc. 'Budget' is insufficient to indicate financial because it is the wording of the question. E.g. 'Go over budget' (0) TV. 'Spend recklessly' (0)
1	(c)		Responses include: Measurable e.g. objective, can compare, can track/monitor, can see progress, etc. Specific e.g. to avoid confusion/misinterpretation/doubt, etc	2	One mark for each correct identification to a maximum of two. 'Know what they are supposed to be doing' (0) TV.

Question			Answer	Marks	Guidance
1	(d)		Responses include: • Purpose • Aims • Targets • Scope • Constraints • Deliverables • Communication • Controls	4	One mark for each correct identification to a maximum of four identifications. Do not award objectives as these are excluded by the question.

Question		Answer	Marks	Guidance
1	(e)	Responses include: • Advantage ○ knowledge ○ expertise ○ <u>specialist</u> advice • Disadvantage ○ miscommunication ○ limited availability/could be recalled ○ scheduling difficulties Exemplar responses: One advantage of a representative from Rigo plc being on the project team is that they can provide specialist advice (1) on how IT (CONT) can be used, knowledge that Hawkins Ltd's employees are unlikely to have (+2). One disadvantage of a representative of Rigo plc being on the project team is that Ivan may experience difficulty scheduling meetings (1) with them and the other 11 (CONT) project team members because it is more difficult to contact someone based off-site (+2).	3 x 2	In each case, award: One mark for identification PLUS Two marks for contextual explanation OR One mark for non-contextual explanation. Accept explanation of cause or consequence. NB Advantages/disadvantages to Ivan (not solely to project/company). E.g. do not accept arguments relating to cost as these relate solely to the project/company.

Question			Answer	Marks	Guidance																
1	(f)	(i)	Indicative content:	2	One mark for each correct identification to a maximum of two identifications. Contradictory response rule applies (see preamble item 5) i.e., if more than two ticks are shown, mark first two from top to bottom.																
			<table><tr><th>Activities:</th><th>Tick (✓)</th></tr><tr><td>Analysing completion figures and complaints</td><td></td></tr><tr><td>Identifying the scale and scope of the project</td><td></td></tr><tr><td>Making proactive and reactive adjustments</td><td></td></tr><tr><td>Obtaining final acceptance of project completion</td><td></td></tr><tr><td>Producing project initiation documentation</td><td></td></tr><tr><td>Receiving frequent reports from team leaders</td><td>✓</td></tr><tr><td>Using project management tools</td><td>✓</td></tr></table>			Activities:	Tick (✓)	Analysing completion figures and complaints		Identifying the scale and scope of the project		Making proactive and reactive adjustments		Obtaining final acceptance of project completion		Producing project initiation documentation		Receiving frequent reports from team leaders	✓	Using project management tools	✓
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			Obtaining final acceptance of project completion																		
			Producing project initiation documentation																		
			Receiving frequent reports from team leaders			✓															
Using project management tools	✓																				

Question			Answer	Marks	Guidance
1	(f)	(ii)	Responses include: • Economic factors ○ inflation ○ rising interest rates ○ exchange rates become unfavourable ○ increased unemployment/decreased employment • Market size ○ reduced/smaller/shrunk/contracted Exemplar responses: Rising interest rates (1) are likely to negatively affect the outcomes of the project because it will cost more to finance the loan (CONT)(+2). If the market size decreases (1) then the company may struggle to find buyers for its hinges (CONT)(+2).	3 x 2	In each case, award: One mark for identification PLUS Two marks for contextual explanation OR One mark for non-contextual explanation. Accept explanation of cause or consequence. NB <u>Change</u> in factor required for first mark. NB Accept effects on project outcomes whilst project is running (e.g. impacts on budget or duration of project) as well as impacts once project completed (e.g. impact on sales revenue or reputation).

Question			Answer	Marks	Guidance
2	(a)	(i)	Indicative content: • 5 weeks.	1	One mark for a correct identification. Units required.
2	(a)	(ii)	Indicative content: • Activity E • Instruct contractor.	1	One mark for a correct identification.
2	(a)	(iii)	Indicative content: • F, G and H • Manage industrial relations, manage public relations, off-site training.	1	One mark for a correct identification. All three activities, and these three only, are required for one mark.
2	(a)	(iv)	Indicative content: • Decision: Yes Ivan is correct/it is a critical activity/it is on critical path • Reason: No slack time, a delay in this activity will delay the entire implementation stage, etc.	2	One mark for a correct identification plus one further mark for explanation. Explanation must relate to the schedule, not to the importance of testing.
2	(a)	(v)	Indicative content: • Impact: None/it will stay the same • Reason: There isn't an activity directly dependent on its completion, it is not a critical activity, it is not on critical path, etc.	2	One mark for a correct identification plus one further mark for correct explanation.

Question			Answer	Marks	Guidance
2	(a)	(vi)	Indicative content: 8 – 6 weeks = 2 additional weeks 27 + 2 = 29 weeks.	2	Award full marks for correct answer i.e. 29 weeks (units required). Award max one mark for 29 with no units. Award max one mark for reference to '2 weeks', if seen. E.g. 'run 2 weeks behind'.
2	(b)		Indicative content: $E = \frac{O + 4M + P}{6}$ M = 30 4M = 120 P = (30 + (30/100 x 90)) = 57 O = (30 – (30/100 x 30)) = 21 $E = \frac{21+120+57}{6} = \frac{198}{6} = \mathbf{33 \text{ weeks}}$	6	Up to six marks. Award full marks 6 marks for correct answer. Correct units required. Award 5 marks for correct numerical answer with incorrect units (or no units). Else award: 1 mark for the following figures if seen: 4M = 120 P = 57 O = 21 (or 3 marks for 198 if seen) 1 mark for evidence of division by 6. For full marks correct units are required. Else award 5 marks for '33'.

Question		Answer	Marks	Guidance
2	(c)	Responses include: • In case something goes wrong • How to deal with negative events • Respond quickly to negative eventualities • Proactive approach • Back up plan • Provides a plan b • Provides a safety net • Mitigates damage • Allows time to deal with events • Allows budget to deal with events Exemplar responses: Contingency planning provides a plan b (1). It is very important to the success of the project, because a project set to take at least 27 weeks (CONT) will almost certainly encounter some issues (+2). Contingency planning prepares in advance how to handle known unknowns (1). It is important because if such an event occurs it will help get the project back on track as quickly as possible (+1).	3	One mark for knowledge of a contingency plan PLUS Two marks for contextual explanation OR One mark for non-contextual explanation. Accept explanation of cause or consequence.

Question		Answer	Marks	Guidance
2	(d)	Responses include: • Ability to establish rapport • Active listening • Communication • Conflict management/avoidance/mitigation/resolution • Critical thinking • Delegation • Decision-making • Information management • Motivation • Negotiation • Problem-solving • Leadership • Team building • Time management Exemplar response: Delegation skills (1) will be needed. This is where tasks are passed down to someone lower in the hierarchy (+1), in Ivan's case a team leader.	2 x 2	In each case, award: One mark for identification PLUS One mark for description No context required. Do not award planning skills as these are excluded by the question. NB Question requires a description rather than an explanation. Do not credit reasons for having these skills. 'Management skills' (0) TV.

Question		Answer	Marks	Guidance
3	(a)	Responses include: • Project monitoring e.g. watch/check progress, note issues arising, identify problems • Project control e.g. correct, fix, intervene, solve problems, change the plan Exemplar responses: Monitoring is the process that looks out for an issue which may cause the project to go off track (1), for example problems with the internet wiring (CONT). Control is the corrective mechanism to solve the problem (1), for example by holding the emergency meeting (CONT)(1). Monitoring checks that something is going to plan (1). Whereas control takes actions when something is going off plan (1).	3	Award: One mark for project monitoring One mark for project control One context mark for correct identification of <u>both</u> activities in Event 1.

Question		Answer	Marks	Guidance
3	(b)	Responses include: - Reschedule meeting e.g. change the date of one of the meetings, change to an earlier date, move to a later date, change the time of one of the meetings, change to an earlier start time, move to a later start time re-issue invitations with a change of date/time, etc - Alternative venue e.g. book an external venue, use one of the company's smaller rooms, split the workforce meeting into two so that smaller rooms are needed, etc - Personnel availability i.e. CEO Amos e.g. send a director to deputise at one of the meetings, split Amos' time between the two meetings, rearrange schedule so Amos can attend both, etc. Exemplar responses: Ivan could ask Orla to bring her meeting forward (1) to an earlier date. Since Orla's meeting is internal, this would help allay the fears of the 46 employees sooner (CONT) without reflect badly on corporate image (+2). Ivan could have authorised the booking of a conference room at a local hotel to accommodate one the meetings (1) so that both meetings can go ahead as planned (+1).	3 x 2	In each case, award: One mark for identification PLUS Two marks for contextual explanation (Event 2) OR One mark for non-contextual explanation. Do not accept argument relating to how the event could have been avoided. 'Combine the meetings' (0).

Question		Answer	Marks	Guidance
3	(c)	Indicative content: - Test: 99.8 (1) <u>percentage/%</u> (1) of <u>LL56 hinges</u> (1) with <u>length</u> (1) within limits. - Findings: 79800 in tolerance (1), 79840 required (1), shortfall of 40 (1), 99.75% in tolerance (1), shortfall of 0.05% (1), 200 out of tolerance (1), 160 limit on out of tolerance (1), 0.25% out of tolerance (1), 0.2% out of tolerance limit (1). - Result: FAIL - Next steps e.g. request assistance from Rigo plc (1), improve operator training (1), adjust machine/recalibrate CNC (1), rerun the test (1), test a different CNC (1), compare results with another machine (1), check drill bit (1), etc.	9	Up to nine marks. Up to four marks for details of test. Up to two marks for details of findings. Max one mark for result Up to two marks for stating recommended next steps. ‘Completed by’ is not required. Do not credit arguments relating to changing the tolerances. Do not credit arguments relating to upgrading the CNS because the project deliverable is the functionality of the CNC machines.

4	(a)	Responses include: • Advantage ○ Time efficient/quick ○ Does not need scheduling ○ Uniformity/consistent questions ○ Tailored/targeted questions ○ Get answers to specific questions ○ Can be statistically analysed ○ Written record ○ Encourages honesty/truthfulness/less bias ○ Written record • Disadvantage ○ Takes time to produce the questionnaire ○ Stationery costs ○ Not environmentally friendly ○ Fixed questions ○ Cannot probe answers ○ Less detailed responses ○ Difficult to express emotions ○ Some items are difficult to explain in writing ○ Low response rate Exemplar responses: One advantage of using printed questionnaires is that they save time (1). This reduces business costs, which is important for since profits are low (CONT)(+2). One disadvantage of using printed questionnaires is that responses cannot be probed (1) e.g. the usefulness of Activity H, off-site training (CONT). This may lead to them the business being less productive (+2).	3 x 2	In each case, award: One mark for identification of advantage/disadvantage PLUS Two marks for contextual analysis. OR One mark for non-contextual analysis. NB Impact on Hawkins Ltd needed for analysis. 'More convenient' (0) TV
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4	(b)	Use level of response criteria. Responses include: • Recognise successes • Recognise failures/Identify lessons learned • Promote the business • Improve the product • Measure/drive customer/stakeholder satisfaction • Help produce final project report • Drive business improvement • Improve project training • Mentor future project managers • Produce future project documentation • Review personal performance e.g. project manager (Ivan), project team leaders (Orla, Umi), project sponsor (Amos), steering committee, contractor (Rigo plc), etc. Exemplar responses: The feedback can be used produce the final project report (L1), a document that formally closes the project (L2). This can then be published to promote the company's successes (L3). Another use is to review team leader performance (L1). It could show Orla what skills to focus on (L2), leading to her own professional development (L3). Promoting company success is the most beneficial because it will increase sales (L4), important as profits are currently low (CONT). Improving Orla's skills may be less useful as with her new skills she may leave for a better job elsewhere (L4).	12	Level of response: Level 4: 10-12 marks Candidate evaluates uses of end of project feedback. Level 3: 7-9 marks Candidate analyses uses of end of project feedback. Level 2: 4-6 marks Candidate shows understanding of uses of end of project feedback. Level 1: 1-3 marks Candidate identifies uses of end of project feedback. Level 4: Award 10 marks for a justified overall judgement of the best/most important use of end of project feedback, with no context. Award 11 marks for a justified overall contextual judgement of the best/most important use of end of project feedback. Award 12 marks for a justified overall contextual judgement of the best/most important use of end of project feedback, with explicit explanation as to why one other use is less beneficial/less important. NB Do not credit retrospective arguments or ones about improving the current project. 'To be a better project manager'(TV). 'So future projects are more successful' (TV).
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