Level 6 Professional Diploma in Procurement and Supply

PD5 - Programme and project management

EXAM EXEMPLAR QUESTIONS

QUESTIONS AND INDICATIVE ANSWER CONTENT

QUESTIONS AND MARKING SCHEME

Q1   Learning outcome: 1.0

Propose how the effective use of project management software can help an organisation manage its projects throughout each stage of the project life cycle.

(25 marks)

Marking scheme

The question asks for a proposal, in other words a detailed point of view.
Candidates could start their proposal with an outline at the most basic level, project management software can assist an organisation to manage projects from start to finish, and allow employees at different levels to have an input into the process.

They could add that project applications can also carry out scheduling, cost control and budget management, resource allocation, collaboration, communication, quality management and documentation or administration.
The aim with these is to handle all aspects and complexities of larger projects and help keep costs down.

However, the question requires a link to a stage process.

During the first initiation stage of a project, software can be used to undertake contingency planning and "what if" analysis, allowing project managers to understand the effects of different scenarios. Project management software enables the various scenarios to be calculated relatively quickly and easily than would be the case manually. Information can be extracted to support the preliminary business case and PID.

In the planning phase, project management software will also make project planning easier in that it will allow the project manager to define the different activities that need to be performed.
It can help in the production of detailed project planning documentation and has functions that would assist project managers in the planning of work scheduling. It will also help in the allocation of resources, setting start and completion dates using network diagrams to show the critical path of activities and Gantt charts for resource planning.

During the execution phase, the software could help in a number of ways. Project management software is particularly helpful in handling complex projects. Re-planning can be done quickly, for example, estimates may change during the project but project management software can produce revised schedules very quickly, and the changes can be reflected in the project plan immediately. Any changes to task lists will automatically create new schedules for the project. The software facilitates resource planning which should enable the most effective use of the various resources, ensuring during project execution that there are the correct staff levels, equipment and material at the right time.

During the project control phase, budget and control features of project software will assist in monitoring and control. For example, actual costs can be quickly compared with budget costs, at both the level of individual activity and for a project as a whole. This will encourage constant tracking of progress, since actual times can be captured and then comparisons made against planned progress enabling project managers to investigate any problem areas without delay. The software allows both standard and tailored progress reports to be produced. The quality of the documentation will be high, and reports can be extracted and shared with the project team, and

other interested stakeholders.

At the completion stage of the project life cycle, the software can be used to produce the completion report, since all information on costs and time will have been captured during the life of the project. The information held in the software can also be easily referenced to ensure all aspects of the work scope have been completed.

It should be noted that candidates may refer to alternative project life cycle model other than the five stages outlined above but responses which are simply descriptive will not address all aspects of the question.

In addition, stronger responses might show extended study in this area by outlining that there are many good project management software applications available, (with Microsoft Project being one of the most popular) mid-range project management packages, and the likes of Primavera being popular at the higher end. Often free and open source project tools are also available to download or use via a web browser. This type of additional input should be rewarded.

(25 marks)

CIPS study guide references: Chapter 3, section 4, page 40 onwards
Chapter 4, section 3, page53 onwards

Q2   Learning outcome: 2.0

(a)   Analyse the Discounted Cash Flow (DCF) technique for appraising large investment decisions.

(10 marks)

(b)   A car manufacturer has decided to make a significant investment into expanding its presence in Africa by setting up a large assembly facility in Kenya. It has estimated its initial set up costs to be in the region of Kenya Shillings 6,398M.

Forecast net income from the project is detailed below:
Year 1 Kenya Shilling 1,400M
Year 2 Kenya Shilling 1,450M
Year 3 Kenya Shilling 1,550M
Year 4 Kenya Shilling 1,625M
Year 5 Kenya Shilling 1,480M.

(i)   Calculate the projected payback time for the project to the nearest month.

(3 marks)

(ii)   Calculate the Net Present Value of the project using a discount factor of 5% and comment on the attractiveness of the project.

Discount factors at 5% are;
Yr 1 = 0.952, Yr 2 = 0.907, Yr 3 = 0.864, Yr 4 = 0.823, Yr 5 = 0.784

(12 marks)

Marking scheme

(a)   **Discounted cash flow**
Candidates could start their analysis of this technique as this takes into account the time value of money. It is based on the principle that money is worth more than it is in the future. The principle exists for two reasons:

Risk – money in the future is uncertain.
Opportunity cost – money could be in an interest account earning interest.

Discounting
This is the process of adjusting the value of money from its present value to its value in the future. The key to discounting is the rate of interest. The business chooses the most appropriate rate for the life of the project. It then identifies the discounting factor. The amount of money is then multiplied by the discounting factors to convert it to its net present value.

Candidates are required to analyse DCF and should cover most of the following;

DCF advantages
Considers the time value of money
Reducing discounting rate reduces future monies more heavily
Only one method that gives a definitive answer
Positive return – it is worth doing.

DCF disadvantages
Time consuming
More difficult to understand
Based on an arbitrary choice of interest rate.

Mention could also be made of the choice of discount factor and also the link of DCF with the IRR of a project.

The above is certainly enough to score very well but the very best responses could demonstrate knowledge in this area by going on to say that the most widely used method of discounting is exponential discounting, which values future cash flows as "how much money would have to be invested currently, at a given rate of return, to yield the cash flow in future." Other methods of discounting, such as hyperbolic discounting, are studied in academia and said to reflect intuitive decision-making, but are not generally used in industry.

The discount rate used is generally the appropriate weighted average cost of capital (WACC) that reflects the risk of the cash flows. The discount rate reflects two things:
1. The time value of money (risk-free rate) – according to the theory of time preference, investors would rather have cash immediately than having to wait and must therefore be compensated by paying for the delay.
2. A risk premium – reflects the extra return investors demand because they want to be compensated for the risk that the cash flow might not materialise after all.

(10 marks)

(b)   (i)   Payback period is 4 yrs and 3 months – to nearest month any method acceptable.

(3 marks)

    (ii)   Net Present Value calculation (Units are Kenya Shilling M)
        Yr 1 1400 x 0.952 = 1332.8
        Yr 2 1450 x 0.907 = 1315.15
        Yr 3 1550 x 0.864 = 1339.2
        Yr 4 1625 x 0.823 = 1337.375
        Yr 5 1480 x 0.784 = 1160.32
        Total 6484.845
        Minus Initial Inv 6398.00
        Net present value 86.845M Ken Shilling.

(9 marks)

Comment:
Whilst the project demonstrates a positive NPV – the amount is extremely modest and represents just 1.5% of the value of the initial investment. Further consideration and investigation of the project would be strongly recommended before decision to proceed. Stronger responses might comment on the impact of changes in economic factors that might warrant a different discount rate to be considered.

(3 marks)

CIPS study guide reference: Chapter 8, section 2 and 4

Q3   Learning outcome: 3.0

(a)   Compare and contrast the project evaluation and review technique (PERT) with the critical path method (CPM).

(15 marks)

(b)   Using the information in **Table 1**, assuming that the project team will work a standard working week (5 working days in 1 week) and that all tasks will start as soon as possible:

Task	Description	Duration (Working Days)	Predecessor/s
A	Requirement Analysis	5	
B	Systems Design	15	A
C	Programming	25	B
D	telecoms	15	B
E	Hardware Installation	30	B
F	Integration	10	C, D
G	System Testing	10	E, F
H	Training/Support	5	G
I	Handover and Go-Live	5	H

Table 1

(i)   Determine the critical path of the project   **(3 marks)**

(ii)   Calculate the planned duration of the project in weeks   **(3 marks)**

(iii)   Identify any non-critical tasks and the float (free slack) on each.   **(4 marks)**

Marking scheme

(a)   Candidates are required to compare and contrast, i.e. to examine one thing in relation to another so that points of similarity or difference become evident. The contrast element of the response should further highlight the key differences.

PERT (Programme or Project Evaluation and Review Technique) and CPM (Critical Path Method) are specialised project management techniques and scheduling tools that allow managers to plan, manage and control complex tasks and projects. They are jointly referred to as network analysis, programming models, and critical path analysis (CPA) techniques, and although they are fundamentally different in their unique characteristics, they are usually used in conjunction with each other. PERT and CPM are used in various industries to effectively plan, organise and monitor project management related activities. PERT charts are management tools that facilitate effective decision making. They are diagrams that represent the flow of activities through a process, highlight all dependent tasks and events, display the sequence of events from the start of a project to its termination and highlight the critical path of a project.

Activities are represented by boxes, and links between different activities are represented by arrows. A CPM network diagram is activity-oriented, showing the sequence of activities in terms of cost and time. PERT and CPM define projects by specifying their component tasks and activities. A PERT/CPM chart clearly shows relationships and dependencies between different tasks of an activity.

When carrying out the comparison and contrast, candidates need to make it clear that PERT is a probabilistic tool using three estimates of duration for completion of activities of a project and is basically a tool for planning and control of time whereas, CPM is a deterministic tool, with only single estimate of duration. CPM also allows an explicit estimate of costs in addition to time; thereby CPM can control both time and costs. This different ion is vital.

While PERT is more suitable for R&D related projects where the project is performed for the first time and the estimate of duration are uncertain, CPM is best suited for routine and those projects where time and cost estimates can be accurately calculated.

PERT and CPM are effective forecasting tools and can predict future elements of a process or project. They allow managers to probe and analyse all possibilities, pitfalls, ambiguities and uncertainties. They are used to determine and avoid surprises and minimise wastage. Project managers comprehensively analyse all factors that affect a project and its successful completion in advance, plotting that data clearly in the form of a diagram.

Higher scoring answers could also add that PERT considers optimistic, likely and pessimistic time, thereby adding an element of probability to the final figure one obtains.

CPM takes only a single time for any task. This time typically would be the 'likely' time for the task.

PERT estimates may prove to be better for projects with long durations due to its ability to absorb a certain level of flux.

(15 marks)

(b)   (i)   The critical path of the project can be ascertained as follows:
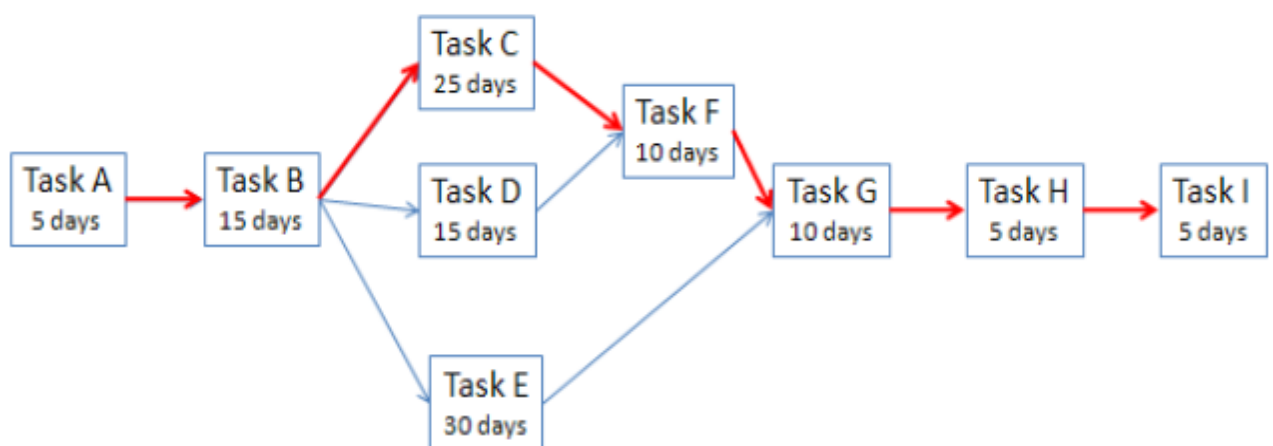
The critical path runs through Tasks, A, B, C, F, G, H and I.

(3 marks)

(ii)   The sum of the critical task durations is 75 days - therefore the planned duration of the project is 15 weeks.

(3 marks)

If 75 days is stated award (2 marks).

(iii)   Task D is non-critical with 10 days (2 weeks) float
Task E is non-critical with 5 days (1 week) float
Award 1 mark for identifying each task and 1 mark for the correct calculation of float in each case.

(4 marks)

CIPS study guide reference: Chapter 12, page 158 onwards

Q4   Learning outcome: 4.0

Discuss the tools and techniques that project managers can use to ensure knowledge and lessons learned from previous projects are not lost, and can be shared for the benefit of future projects.

(25 marks)

Marking scheme

The answer requires candidates to discuss the tools and techniques that project managers can use to ensure knowledge and lessons learned from previous projects are not lost, and can be shared for the benefit of future projects, which provides a broad scope for discussion.

Candidates could start with a broad overview; everything learned from previous projects, whether they were successes or failures can teach a project manager important lessons. And individual project managers usually do learn from their own previous experiences, but are these "lessons learned" shared with others within the project team or within the same organisation? If they are shared, do other project managers apply the lessons to their own projects? These are key questions which a candidate could summarise.

There are a number of tools and techniques which could be explored, including but not limited to:

Project review procedures
This implies an internal review of project performance, undertaken primarily by the project team as part of the completion phase. The object is to identify strengths and weaknesses in respect of future projects. Reviews may also be held before the completion of the project, if required.

Project reports
Frequently, major project teams will be required by the organisation to document the results of the project in a formal project report, thereby making the information available for all those that ollow. The quality of such reports can be variable if insufficient time is available.

Project audits
This implies a similar process to an internal review but carried out at least in part by an impartial third party such as consultants. This is not without cost and occasional tension but an independent appraisal may be valuable. An audit conducted before the end of a project is usually a sign of problems being encountered but should still be regarded as a positive process rather than a critical fault-finding exercise.

Lessons learned database
Many organisations are launching such tools, making lessons learned readily available to staff via electronic means. Frequently, such resources can be found on company intranets. The main challenge is to populate the database with quality information.

Rotation of project staff/managers
Where feasible, most project organisations regard the rotation of staff as good practice enabling the sharing of knowledge to be done 'on the job' where strengths from one project can be swiftly applied to another to avoid problems.

There are numerous other ways in which a project can be reviewed and candidates should be rewarded for relevant data (e.g. project manager acting as facilitator for best practice etc.)

Candidates including relevant academic references (e.g. Senge) should be credited generously. Similarly where candidates refer to appropriate sections of project management methodologies (e.g. Prince2, PMBOK etc.) this should also be rewarded.

In addition to direct comment on tools and techniques stronger responses could include discussion that capturing lessons learned from projects is key for any organisation. Unfortunately, project teams are usually moved quickly from project to project and capturing lessons learned is never a priority. To ensure efficiencies over time and development of best practices, it is essential to capture lessons learned on projects.

(25 marks)

CIPS study guide reference: Chapter 16, section 4, page 212 onwards