Exercises on Project Management

Do the following Exercises

- Discus THREE reasons why we need project management in software engineering projects

Solution:

- Software project management is to ensure that software is delivered
  - On time
  - Within budget
  - With Quality
- Good management cannot guarantee project success, but bad management usually results in project failure.
- Project manager is responsible for planning and scheduling project, monitoring progress

Do the following Exercises

- Discus THREE differences between traditional engineering projects and software engineering project

Solution:

- Software products are intangible and flexible.

- Software engineering is not recognised as a sane engineering discipline
  - not standardised

- Many software projects are 'one-off' projects
  - Technologies are changing too fast.
  - Previous experiences may be obsolete.
  - Require a perceptive insight.

Do the following Exercises

- What is project scheduling? Discuss THREE project scheduling processes

Model Solution:

- Project scheduling is the art of estimate time and resources required to complete activities and organise them into a coherent sequence.

- 3 project scheduling process:
- Split project into separate tasks ⬚ estimate time and resources required to complete each task.
- Organise tasks concurrently ⬚ to make optimal use of workforce.
- Minimise task dependencies ⬚ to avoid delays caused by one task waiting for another to complete.
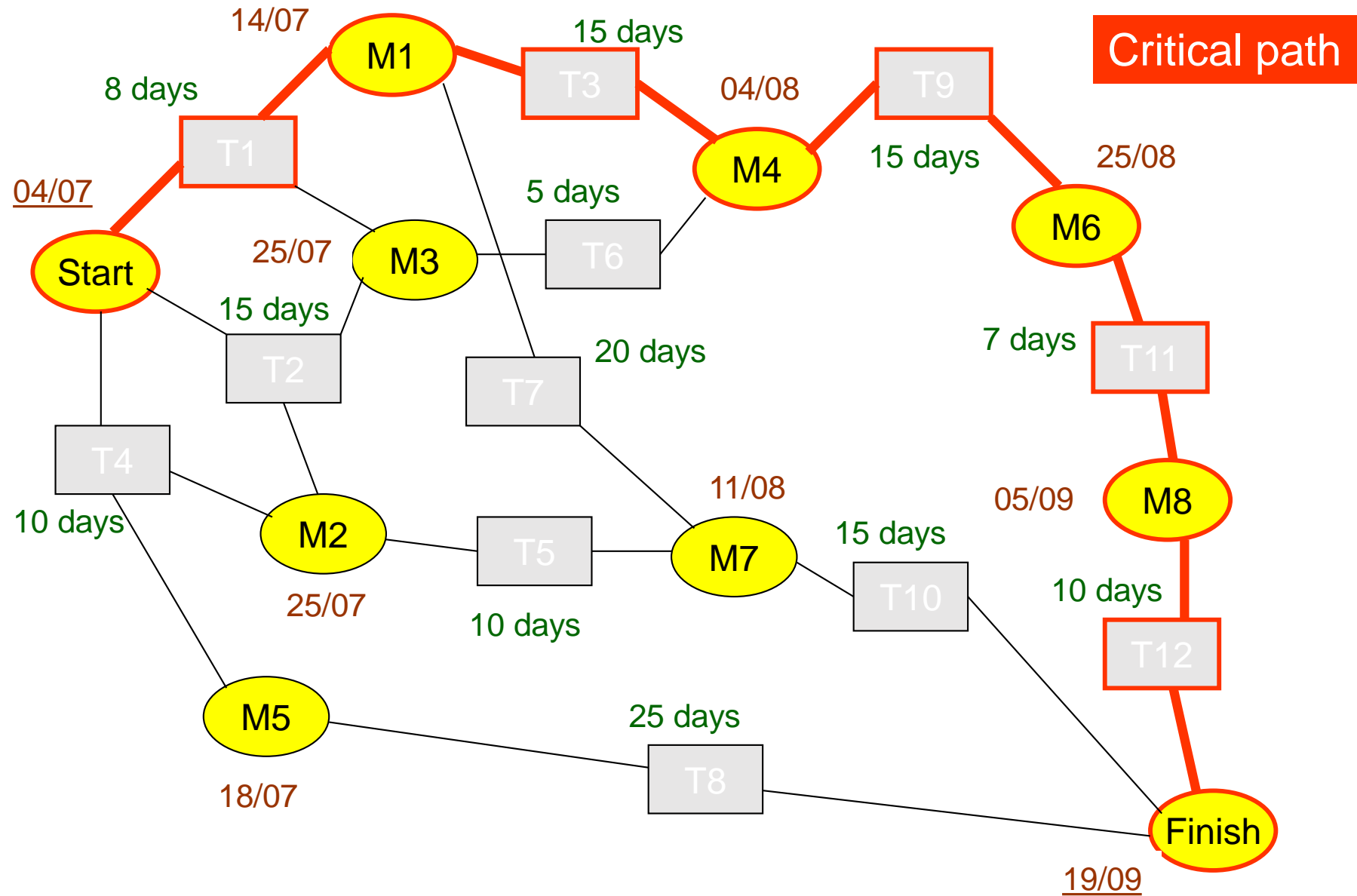
Do the following Exercises

- What is a Critical Path in Activity Network diagram?

Model Solution:

- <u>The minimum time to finish the project</u> can be estimated by the *"critical path", which is usually the* longest path of tasks represented in an Activity Network diagram measured from the start point to the finish point in the network.

Activity Network

Critical path

04/07 — Start — 8 days — T1 — 14/07 — M1 — 15 days — T3 — M4 — 04/08 — T9 — 15 days — M6 — 25/08

25/07 — M3 — 5 days — T6

15 days — T2 — 25/07 — M3

T7 — 20 days

T4 — 10 days — M2 — 25/07 — T5 — 10 days — M7 — 11/08 — T10 — 15 days

7 days — T11 — 05/09 — M8 — 10 days — T12

M5 — 18/07 — T8 — 25 days — Finish — 19/09

Do the following Exercises
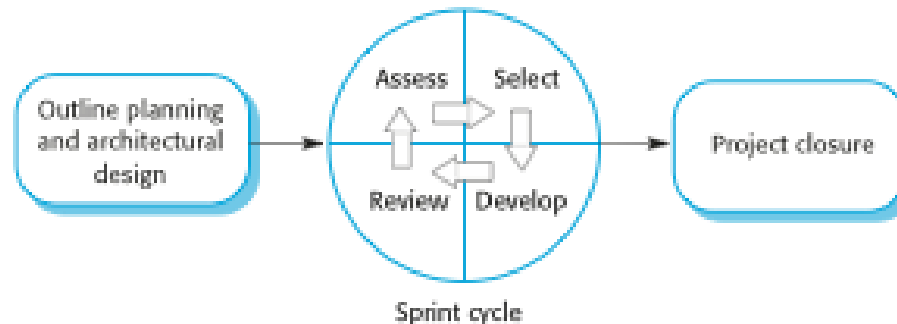
- Discus FOUR people management factors

Model Solution:

- Consistency ▯ Team members should all be treated in a comparable way without favourites or discrimination.

- Respect ▯ Different team members have different skills and these differences should be respected.

- Inclusion ▯ Involve all team members and make sure that people's views are considered.

- Honesty ▯ You should always be honest about what is going well and what is going badly in a project.

Do the following Exercises

- What is Scrum? What are the responsibilities of a Scrum Master?

Model Solution:

- Scrum is an agile process framework for managing software development designed for teams of 5 to 9 or fewer members, who break their task into goals that can be completed within timeboxed iterations, called sprints, no longer than one month and most commonly one to two weeks, then track progress and re-plan in 15-minute time-boxed daily meetings, called daily stand up meetings (Wikipedia).

Outline planning and architectural design → Assess | Select / Review | Develop (Sprint cycle) → Project closure
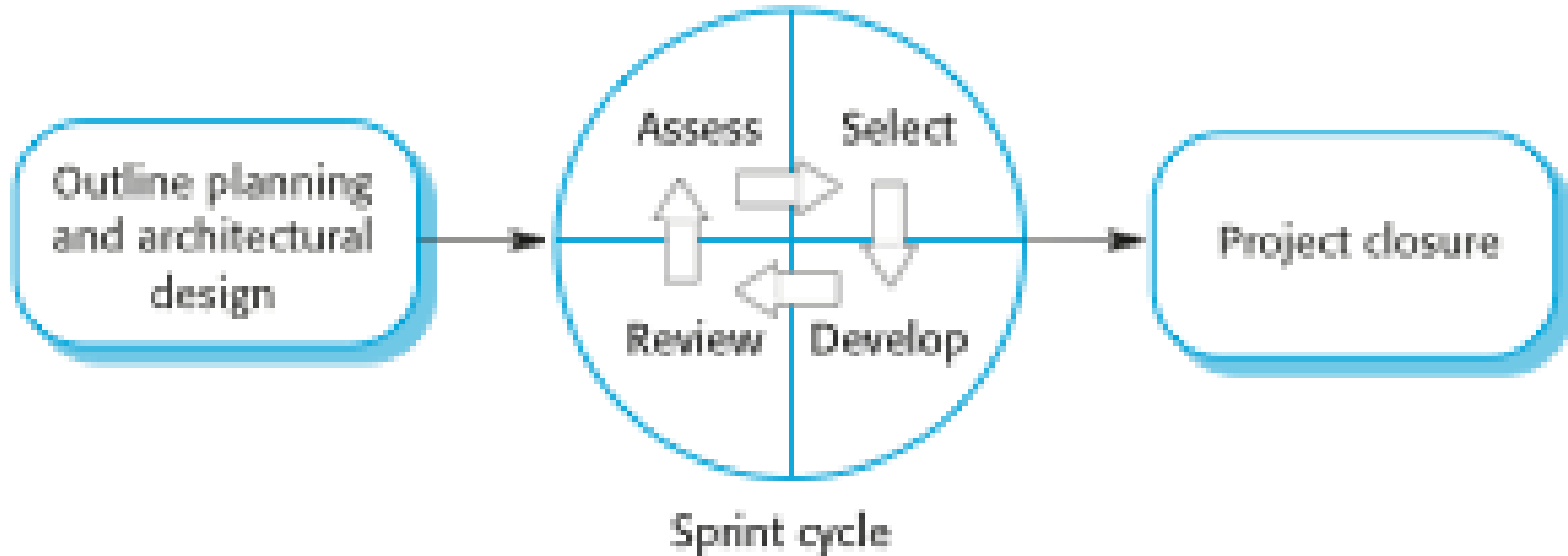
Do the following Exercises

- What is Scrum? What are the responsibilities of a Scrum Master?

Model Solution:

- The 'Scrum master' is a facilitator who
  - arranges short daily stand up meetings
  - tracks the backlog of work to be done
  - records decisions
  - measures progress against the backlog
  - communicates with customers and management outside of the team.

Do the following Exercises

- Discus the THREE phases of Scrum

- Model Solution:

Do the following Exercises

- What is a Risk? Discus THREE types of risks.

Model Solution:

- A risk is a probability of something undesirable happening during the development of a software product.
- Risks can be divided into:
    - Project risks : where the schedule or resources available for the project are affected
    - Product risks : where the quality or performance of the software produced is affected
    - Business risks : where the organisation which is developing or procuring the software is affected

Do the following Exercises

- Discus Risk Management

Model Solution:

- Risk management is the process of identifying possible failures, establishing where alternative plans should be developed, and making those alternative plans in case anything goes wrong during product development process.

Do the following Exercises

- Discus FOUR risk management processes

Model Solution:

The tasks involved in risk management process are:

- Risk Identification
  - Identify project, product and business risks
- Risk Analysis
  - Assess the likelihood and consequences of these risks
- Risk Planning
  - Draw up plans to avoid or minimise the effects of the risk
- Risk Monitoring
  - Monitor the risks throughout the project

Do the following Exercises

- What is Contingency? Discuss what you understand by "Avoidance Strategy" in project management.

Model Solution:

- A Contingency is an alternative plan which is established to be carried out if the original plan cannot be followed due to some problems and this might involve:
  - Alternative resources being identified (human, tools, location)
  - Possibility of outsourcing work and resource supply
  - Priority on which parts of the project to continue, which to postpone or abandon
  - Identifying aspects of the project which could be modified

Do the following Exercises

- What is Contingency? Discuss what you understand by "Avoidance Strategy" in project management.

Model Solution:

Avoidance strategy involves doing one or more of the following activities:

- Being careful about using new or unfamiliar products (tools, software, hardware), balance any benefit obtained from risk they will not perform as expected
- But keep awareness of new products, do not stick to old tools and systems out habit or unwillingness to change
- Ensuring staff are well trained, avoid having just one person who has skills and/or knowledge of a vital topic
- Ensuring working environment is pleasant, so staff are not tempted to move
- Maintaining awareness of the market, new technologies, competing products
- Ensuring senior management are well informed on progress of project and its importance to the organisation's goals
- Actively monitoring performance, be prompt if there is any slippage, do not "hide" problems from senior management or staff

Do the following Exercises

- Discuss Quality Management in project management in respect to quality of software products,

Model Solution:

- Software quality management is concerned with ensuring a suitable level of quality is achieved in a software product

- Quality management involves establishing processes and standards within the organisation that will lead to it producing high quality software

- For individual projects, a <u>separate</u> quality management team should check the deliverables to ensure they are consistent with the organisation's standards and goals

- Separating quality management from general development ensures an independent view is taken of the software

Do the following Exercises

- Discus "Good Enough" software

Model Solution:

Good enough software means:

- An acknowledgement that it is difficult (and expensive) to guarantee software is completely free from errors

- Achieving a balance between meeting consumer demand for new products or client demand for software to be produced by a deadline, and giving guarantees about performance

- Considering software for use in safety critical applications (ceg ontrolling machinery where an error could result in injury or loss of life) needs higher standards than software for routine administration or entertainment

- Companies producing software need to balance the advantage of bringing new products to market quickly with the risk of damaging reputation if their products are often of poor quality

Do the following Exercises

- Differentiate between a "Bug" and a "Feature" in software engineering

Model Solution:

- A "bug" is some aspect of the software or hardware ystem's behaviour which it is acknowledged is incorrect

- A "feature" is an aspect of the system's behaviour which is acknowledged as correct

Do the following Exercises

- Discus "High Quality" software

Model Solution:

High quality software means that:

- The software should meet its specifications

- It should be efficient and easy to use

- It should be easy to modify to meet changing requirements

- The code should have good structure which does not break the main design principles tha will greatly contribute to high quality code in terms of meeting customer requirements