Exam, questions

Project Management and Engineering Practice (University of Western Australia)

GENG5505 Exam

Section A

1. **From your project, describe the four stages: concept, planning, execution including monitoring and controlling, and finalisation. Show how each of them contributed to the project's success.**
2. **From your project, explain the 4 stages of a project. Show how each of them led to the project's success.**

CONCEPT:

Conceptualisation is the initial stage of the project. It is where the project idea is initially created, and a fundamental understanding of the project begins to make shape. The main output from this stage is the project charter.

One of the most common reasons projects fail after the concept stage is due to the lack of understanding and clarity between expectation and the project's final output. This is because many project stakeholders ignore the basic tenet of project management; identify the problem before you schedule the solution. The concept stage provides this identification, as it requires that the project is correctly justified, investigated, assessed and approved. The concept stage seeks to capture, document and clarify relevant information on the four input constraints found in every project (time, cost, resources and specification).

- o preliminary goals, objectives (SMART)
- o deliverables & strategic vision alignment
- o problem raised
- o impact assessment in terms of TBL
- o potential benefits identified
- o cost estimation
- o success criteria

PLANNING:

The second stage of the project is planning. At this stage all the work required for the successful completion of the project is undertaken and the scope of the project is clearly defined. The project statement is a key output.

- o all work required, planned, scheduled
- o objectives are finalized
- o resources are assigned
- o quality is signed off (including TBL and life cycle guidelines & standards)
- o final costs are approved
- o timing agreed
- o all others administrative matters are determined

EXECUTION:

Execution, including monitoring and controlling, is the third stage of the project and includes the implementation of the work proposed in planning. Performance, scope and quality checks ensure the project is up to standard. A project report is a decision gate.

- o tracking actual progress
- o work is monitored, controlled, corrected where necessary with schedules being reviewed, revised, updated as required

FINALISATION:

Finalisation is the last stage of the project. This is the handover to the client. Lessons learnt.

- o project is completed & deliverable handed over to the client
- o resources are disposed or reassigned
- o project is evaluated
- o reports are written & presented
- o administration arm of the project is closed

Effective project control:
- establishing the standards
- monitoring the standards
- measuring performance
- taking corrective action

3. **Explain how a sustainable approach to project management, consistent with the Triple Bottom Line approach can improve each stage of a project.**
4. **Explain how a sustainable approach is consistent with the Triple Bottom Line. Explain how it could improve the project when applied to every stage of the project**

- A company's ability to achieve its business goals and increase long-term shareholder value by integrating economic, environmental and social opportunities into its business strategies.
- It makes for a sustainable enterprise
- Long-term financial interests of a company are not mutually exclusive with acting fairly in the interests of stakeholders
- Indicators for measuring sustainability:
  - Economic sustainability → financial health, economic performance, ROI, governance, innovation, risk (will the project generate prosperity and enhance the affected economies?)
  - Environmental sustainability → resource extraction, emissions, air/water, waste, hazardous materials (Will the project cause long-term damage to the environment?)
  - Social sustainability → internal HR, external population (Will the project be implemented in a socially responsible manner and benefit the affected communities in a fair and equitable way?)
- Sustainability: meeting the needs of people today without compromising the ability of future generations to meet their own needs

Factors driving sustainability:

- Desire for environmental/social stewardship
- Desire to increase brand reputation/value
- Obtaining competitive advantage
- Internal/external stakeholder pressure/expectations
- Rising energy costs

- Regulatory compliance

Section B

1. **Differentiate the 3 numerical methods of categorizing a project. Which is the most exhaustive one? ©**

Project selection models:

Non-numeric:
   1) Sacred cow: project chosen/protected by senior executive
   2) Operating necessity: to maintain operational functionality
   3) Competitive necessity: to maintain a competitive advantage in the marketplace
   4) Project extension: the product/service is repositioned favourably with customers
   5) Comparative benefit: applies to companies seeking multiple projects with differing benefits

Numeric:
   1) Payback period: the time taken to earn back the money invested in a project

$$Payback\,period = \frac{cost\,of\,project}{annual\,cost\,revenue}$$

   Issues: doesn't consider the time value of money or the cash-flow period of the project
   2) Return on Investment (ROI): the overall profit on an investment calculated as a percentage (%) of the total amount invested (most used)

$$ROI = \frac{(net\,profit)}{total\,investment} \times 100$$

   Issues: doesn't consider the time value of money
   3) Net Present Value (NPV): the projected profitability of an investment, based on the future anticipated cash-flows and discount at a stated interest rate. (most exhaustive)

$$NPV = cash\,flow \times discount\,factor$$

$$discount\,factor = \frac{1}{(1+i)n}$$

2. **Referring to your own group experience, explain the stages of team development. ©**

Not a linear process
   - Forming: Member join and begin the process of defining the group's purpose, structure and leadership. (Group forming in class and first group meeting)
   - Storming: Intragroup conflict occurs as individuals resist control by the group and disagree over leadership. (Meetings 2 and 3, no clear direction to get project progress)
   - Norming: Close relationship develop as the group becomes cohesive and establishes its norms for acceptable behaviour. (Meeting on regular basis with updates on project progress, group members work on individual aspects of project)
   - Performing: A fully functional group structure allows the group to focus on performing the task at hand. (Group actively contributing to the report and meeting on regular basis)
   - Adjourning: The group prepares to disband and is no longer concerned with high levels of performance. (Project submitted, and final presentation completed)

3. **What are the 10 key competencies for running a team based on PMBOK? ©**
   1) Project Stakeholder Management: includes the processes required to identify, plan, manage and control stakeholder engagement throughout the project.

2) Project Scope Management: includes the processes required to determine and manage project expectations and deliverables, including planning, authorisation and controls throughout the project.
3) Project Time Management: includes the processes required to determine and implement the project schedule and to manage the agreed timelines with appropriate intervention strategies throughout the project.
4) Project Cost Management: includes the processes required to identify, analyse and refine project costs and to ensure that project costs are managed, reported and controlled throughout the project.
5) Project Quality Management: includes the processes required to manage the quality planning, assurance, control and improvement processes and policies throughout the project.
6) Project Human Resources Management: includes the processes required to determine the resources needs, assignment priorities, development needs, performance issues and evaluation throughout the project.
7) Project Communications Management: includes the processes required to ensure that timely and appropriate information is collected, disseminated and evaluated through managing formal and/or semi-formal structures throughout the project.
8) Project Risk Management: includes the processes required to manage the identification, assessment, treatment, monitoring, controlling and evaluation of project risks throughout the project.
9) Project Procurement Management: includes the processes required to manage procurement activities throughout the project.
10) Project Integration Management: includes the processes required to integrate and balance the project management knowledge areas (all other competencies) throughout the project.

4. **What are the important considerations for good communication? Choose two stakeholders and discuss the some of the barriers to communication.**
   - Information provided in the right format, at the right time, to the right audience with the right impact.
   - Full engagement of speaker and listeners
   - Continually improve the communication chain
   - Consider the field of expertise of the stakeholder
   - Project meetings with a clear agenda and clear objectives
   - Kick off meeting to detail the project objectives, expectations, deliverables, outcomes and benefits; review of all scope inclusions and exclusions
   - Kick out meetings to formally close the project
   - Project performance reports: concise and honest summary of the project's progression, status and likely conclusion.
   - Reporting along the reporting continuum (progress, status and forecast)

   Barriers to communication:
   - Lack of client involvement
   - Poorly informed stakeholders
   - Lack of meetings and/or too many meetings leading to little action
   - Lack of reporting requirements
   - Poor and incomplete documentation
   - Frequent scope change
   - Changing project personnel
   - Lack of auditing the project to identify lessons learned

The reporting continuum:
Progress Report (time zero to present): reports on information after it has happened.
Status Report (present): reports on the current position of the project against the plan.
Forecast Report (completion oriented): reports against the original completion date, anticipated scope changes, pending risks, approvals pending, escalating issues, expected delays, etc.

5. **Why is stakeholder management important? Discuss four stakeholder management strategies.**

   Stakeholders are persons or entities that affect the outcome of a project. Stakeholder offer many challenges to a project (changing expectations, vested interests, diverse roles, may be internal or external, varied involvement, impact success or failure, have differing needs, and visible legitimacy). Stakeholder management ensures that there is clear assignment of responsibilities, accountability and transparency, identification, communication and management of all stakeholders.

   The diversity of ideas, contribution, support and challenges are all by-products of working with project stakeholders. Therefore, projects cannot be commenced and/or completed without them and it is through their support, commitment, confidence, urgency, direction, ownership, decision-making, problem solving, inclusion and involvement that projects are able to deliver outputs and/or outcomes over time. Each stakeholder's influence and impact on the project is different. Therefore, it is very important to adopt a stakeholder management strategy that treats each stakeholder uniquely.

   Stakeholders:
   - Sponsor (client or owner) – identify and/or confirm the business need and initiate the project.
   - Project (parent) organization – provide organizational structure for project, aligning with, and supporting, the project directive.
   - Project management office (PMO) – act as the central repository for all 'things' projects (e.g. registration, documentation, training, resourcing, approvals, change controls and/or reviews)
   - Project steering committee – often comprising organization-wide senior and/or executive management. They sit across multiple projects providing a governance role to ensure all projects align with both corporate objectives and strategic direction. They can also approve, prioritise and stop projects.
   - Portfolio managers – work strategically either overseeing all projects being completed or those within their particular functional area. Interested more in strategic alignment, client liaison and management, performance measurement and reporting.
   - Program managers – coordinate multiple projects (related and/or interdependent).
   - Project manager – appointed to manage the project. They have the 'single point' authority, accountability and visibility to manage the project from start to finish. They also have to identify, influence and manage the changing expectations of other stakeholders.
   - Project team (subject matter expert – SME) – engine room of the project providing the technical expertise to perform all project activities. They report to the project manager.
   - End users (often confused with clients) – use the delivered product or service.

Response strategies to stakeholder pressure:
- Adaptation strategy: obeying the demands and rules that are presented by stakeholders – adjust to stakeholder pressures to be able to achieve the planned objectives
- Compromising strategy: negotiating with stakeholders, opening the dialog and listen to their requests and offer compensations with appropriate.
- Avoidance strategy: loosing attachment to stakeholders and their claims. Transferring the responsibility of dealing with the claims to others in the project network.
- Dismissal strategy: ignoring stakeholder demands, not considering stakeholder requirements in implementing the project stages
- Influence strategy: dealing proactively with the demands from stakeholders, creating and communicating value to stakeholders while building relationship with them.

Frameworks:
- Stakeholder management matrix
- PARIS framework (Participate, Approve, Responsible, Inform, Signoff)
- RACI framework (Responsible, Approve, Consult, Inform)
- Stakeholder power and interest matrix

Four strategies that could be used to manage both stakeholder influence and impact are shown below:
- Mapping influence and impact (quadrant approach) – plot impact vs. influence and determine management strategy based on which quadrant a particular stakeholder lies (recommended strategies given in literature)
- Classify stakeholders under the following headings and derive management strategy from there:
  - Champion
  - Advocate
  - Liaison
  - Subject matter expert
  - Team member
  - Sponsor
- Produce a stakeholder management matrix: Table providing information including name, responsibilities, information required (by them), format (how they are provided with information) and frequency (meetings)
- RACI matrix: List activities across columns and stakeholders down rows
  - For each stakeholder indicate:
    - Responsible (charged with doing the required activities),
    - Approve (approve all decisions)
    - Consult (need to be consulted prior, during or after an action) or I for
    - Inform (needs to be kept informed of progressive actions)
  - Another acronym is PARIS
    - Participate (charged with doing the activity)
    - Approve (needs to approve all decisions)
    - Responsible (charged with doing the activity)
    - Inform (needs to be kept informed of progressive actions)
    - Sign off (provides official sign off)

6. **What is life cycle thinking and why is it important to project management?**
   Lifecycle thinking is the consideration of factors beyond the traditional boundaries. Lifecycle thinking is an ideological technique used to analyse and assess projects. In a project management context, life cycle thinking is breaking the project down. The lifecycle is a series

of phased stages or decision gates that the project endures from start to close. Each of the stages triggers important documents throughout the project.

Life Cycle Thinking – 'Cradle to Grave'

- Resource Extraction → Production → Consumption → Pollution
- Extend product life through appropriate design to enhance product. Replacement decision can be influenced through these design strategies. Design for:
- Reliability & robustness → not easily broken
- Reparability → simple so that consumer can perform it
- Upgradability → simple again
- Variability → more enduring interest in the product
- Attachment → disposal of products made harder when emotional attachment
- 70% of total product costs saved in design.

Lifecycle Impact Assessment: An impact is a positive or negative result of an effect of a product, process and/or activity including all the social, economic and environmental consequences and implications.

Lifecycle thinking allows the project manager to see the lasting impact of the project. A lot of project managers see the end of the project as being the handover. With life cycle thinking, the project manager is able to see the impacts their decisions and implementations make on an environmental, social and economic standard.

The lifecycle thinking provides a holistic view on the project, better able to identify risks and problems, and better able to treat them.

Benefits:

- Communicates graphical framework of the total project (an overriding narrative of the total project)
- Details responsibility
- Prescribes manageable portions
- Identifies control gates (limits and/or orders the project's progress through clearly defined stages)
- Flags key decisions
- Nominates milestones and deliverables
- Provides a point of reference against which stakeholders can assess progress
- Facilitates appropriate levels of governance throughout the project
- Promotes a sense of urgency throughout the project

7. **What are the stages of quality management?**

Planning: all mandated quality standards, operational definitions and business requirements relevant to the project are clearly identified and agreed. It then aims to ensure that those same standards can be achieved and measured throughout the project. Eg. benchmarking

Assurance: A declaration or guarantee that the overall project performance is evaluated on a regular basis to give all stakeholders the confidence that the relevant quality standards will be satisfied. Eg. Quality audits, a management plan, integrated change control.

Control: Monitors specific task and project results to identify, measure, eliminate the causes of unsatisfactory performance while ensuring that quality compliance is always demonstrated and achieved. Eg, cause-effect diagrams, pareto charts, data flow diagrams, etc.

Improvement: A continuous process performed throughout the project to ensure that a culture, a commitment and an ownership of what the project is delivering and ultimately, how well it is being delivered. Eg. Regular performance reporting, meetings and debriefs, peer reviews.

8. **What is the Program Evaluation and Review Technique (PERT)? Discuss five advantages and five disadvantages.**
   Program Evaluation & Review Technique (Network Diagram) provides a picture of the project's logic, which the WBS accurately recorded in table format only.

   - Illustrates the project's logic and how it is tied together
   - Shows the relationships between required tasks
   - Shows the flow of work throughout the project
   - Highlights where the critical path lies through the project
   - Shows potential bottlenecks

   Advantages:

   - Excellent visual & interactive graphic to demonstrate the schedule
   - Participative decision making
   - Joint risk identification & response strategy
   - Negotiated concessions
   - Improved team ownership
   - Shows Critical Path
   - Eliminates idle time

   Disadvantages:

   - Difficult to read if the project is large
   - No timeline
   - Difficult to monitor & report performance
   - Not always easy to understand
   - Limited amount of information that can display

9. **Something about the balanced scorecard (BSC) for projects.**
   Balanced Scorecard (BSC): Performance measurement framework, which include strategic performance metrics to give project managers and other key stakeholders a more 'balanced' view of project performance.

   - Customer perspective → customer satisfaction, economic value added, intended objectives
   - Project/Internal perspective → team satisfaction, resource management,

- Financial perspective → within budget, variance between original budget and final budget
- Growth & Innovative perspective → best practices identified, ongoing improvement, aligned with TBL and lifecycle thinking.

Throughout the project lifecycle:

1. Initial measurement to establish baseline for project planning
2. BSC benchmarks are included in overall project plan
3. BSC measurements are implemented and initial benchmarks are used to compare and improve the BSC outcomes
4. BSC measurements are reviewed and documented in the final report to support best practices and for lessons learned.

10. **What is required in a contract for it to be legally binding? What are the three types of contracts we learnt in this course?**
11. **Key elements in contracts, what are the three types of Contracts?**
    Contract: A legally binding agreement between two or more parties to act, or refrain from acting, in a particular way. Has the intent to protect interests of both parties. Key elements include:

- An offer
- Acceptance
- Intention/ consent of each party to be legally bound
- Consideration
- Mutuality
- Capacity
- Legality

Types:

- Fixed Price Contract → Delivery of well-defined product for fixed price
- Cost-reimbursable → Seller is paid for the actual costs incurred plus a fee representing seller's profit
- Time and Materials contract → Contains features of both fixed fee & cost-plus contracts

12. **What are the main budgeting techniques learnt in the course?**
    Traditional: Previous year's level of performance is the foundation for next year's figures.

    Zero-based: Previous years are ignored, and each activity is outlaid and justified. Starts off with zero spending to begin with.

    Program: Activities are grouped together for projecting costs generated by each major activity or program.

    Top down: Senior managers pool their knowledge together and use past results to estimate costs, and then these are further broken down to lower level managers.

    Bottom up: People responsible for directly managing/doing the work will estimate costs, and then these are aggregated to give total project cost.

13. **What can a project manager to do resolve disputes between stakeholders?**
FIVE APPROACHES TO MANAGING CONFLICT:

Avoiding (Low Assertion, Low Cooperation)

- No attempt is made to address the conflict at all. A lose-lose strategy.
- Effective when you can't possibly win, the issue is relatively minor or confrontation may result in damage.

Accommodating (Low Assertion, High Cooperation)

- The other's point of view is considered more important to your own (lose-win).
- Effective when the other person's evidence is more compelling, peace is more important to the valued friendship or you want to create a tactical advantage by offering a concession.

Competing/Forcing (High Assertion, Low Cooperation)

- Power and dominance are used to gain compliance to your own perspective (win-lose).
- Effective when you know you are right, stakes are too high to lose, or a show of force is required.

Collaborating (High Assertion, High Cooperation)

- Mutual and optimal outcomes are sought by both parties (win-win).
- Effective when you want to build an alliance or relationship or want an optimal outcome with sacrificing your own.

Compromising (Mid Assertion, Mid Cooperation)

- A mutually acceptable outcome is reached (that is partially satisfies each party through sacrificing some personal goals.
- Effective when the outcomes are only moderately important to each party or no other option is working

14. **Explain how conflicts can be resolved. If the conflict is rapidly evolving, which strategy would you use and why?**
- Avoiding: Low assertion, low cooperation
- Forcing: High assertion, low cooperation
- Accommodating: Low assertion, high cooperation
- Collaborating: High assertion, high cooperation
- Compromising: Mid assertion, mid cooperation

15. **Why is scope management important? What should be included in a scope management plan?**
A scope management plan documents how the project scope will be defined, validated and controlled. It establishes the direction and guidance parameters on how the scope itself will

be managed. It provides a formal mechanism to limit, assess and authorise changes on a consistent and transparent basis.

What does scope include:
- What is (inclusions) and isn't (exclusions) required
- Establishes a scope baseline for comparisons and updates
- Forms the foundation of the project plan
- Investigates if expectation meets capability
- Identifies the project deliverables, results and benefits

Important because:
- Expectations don't always match capability – expectations will always increase
- Scope will always change over time (scope creep)

16. **What key information should be included in the project charter and why? Discuss**
- Problem
- Goal
- Objectives
- Success criteria
- Risks

A project charter should include:
- Project title
- Project start date
- Project finish date
- Key stakeholders
- Business case supporting the project
- Project goals
- Budget information
- Foreseeable risks
- TBL and life cycle thinking

The project charter provides the following benefits:
- Improved accuracy of estimations
- Define baselines for measuring achievements
- Reduced project scheduling variations
- Strategic justification
- Prioritisation of the project
- Formally establishes the project (a project does not exist without a project charter)
- Designates the parameters within which the project manager has the authority to operate
- Gives the project manager authority to spend money and commit resources
- Provides the high-level requirements for the project
- Links the project to the ongoing work of the organization

The project charter is needed because:
- ensures the project manager understands the sponsor's needs
- provides key information needed to get started
- provides a reference document to make sure everyone is on the same page later in the project
- provides the basis to plan the project

- empowers and protects the project manager by describing what he or she is being asked to accomplish

17. What scheduling tools are available to the project manager and team to plan the project activities? Discuss

The project schedule is the time-based-sequenced description of all of the project activities. There are 4 main tools in capturing and/or communicating the schedule to the stakeholders:
- work breakdown structure (WBS)
- program evaluation review technique (PERT) or network diagram
- critical path analysis (CPA)
- Gantt Chart

Work Breakdown Structure is essential as part of a project's lifecycle and timeline. An important part of project planning, the WBS begins with a hierarchy of tasks and levels that help to identify how the project will flow within a designed timeline set by the project manager. Also, it helps to define the specifics of the project outlined in the project scope.

Network Diagram is essentially a flowchart of the project tasks. The network is created by determining predecessor and successor relationships and connecting the tasks based upon those relationships. In a complex project with many organizations/individuals involved, this technique can provide guidance as to who is the internal customer for each task.

Critical path analysis is used to determine what the shortest time to complete the project (the longest path through the network). It offers a visual representation of the project activities, presents the time to complete the tasks and the overall project and tracks of critical activities.

Gantt chart is excellent for tracking progress or activity for tasks once they have been scheduled. It is used for daily/weekly tracking of project progress and it is easy to use and maintain. It creates focus for tracking progress because it is clear to see whether a task should be completed, underway, or pending at any given time.

18. What is the difference between a schedule drawn 'in series' and one drawn 'in parallel'? Discuss and provide examples to substantiate your answer.

The network can be drawn either 'in series', which is a straight line or linear network with one activity following directly on after its linked predecessor, or 'in parallel' where there are two or more paths of linked activities through the network from start to finish.
For example, there are 4 tasks in this project.
- Task A takes 1 day to complete
- Task B takes 4 days to complete and can be executed in parallel with Task C which takes 11 days to complete
- when Tasks B and C are completed, Tasks D can be executed which will take 3 days to complete
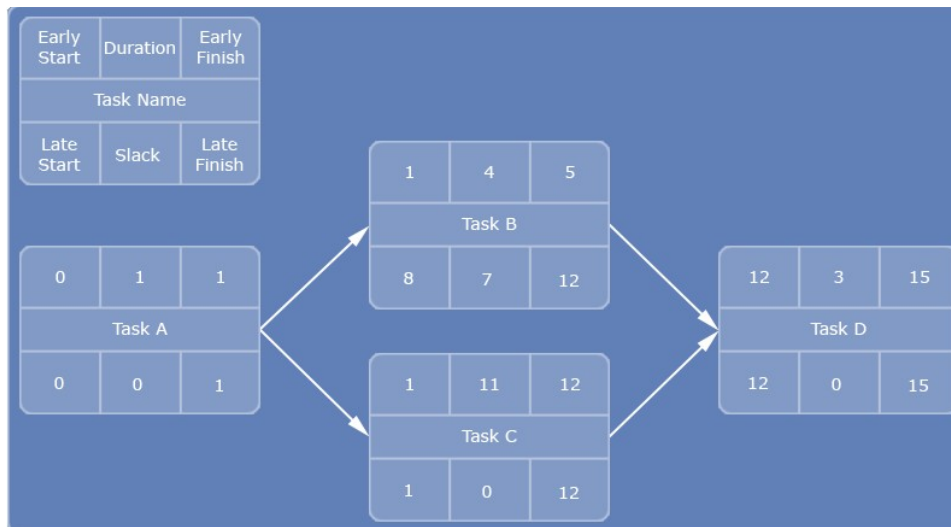
19. **What are some of the key characteristics of a highly performing project team? Discuss and provide examples to support your answer.**
    - **Shared Vision –** when each team member understands where the team is headed and how their specific role contributes to the goals and vision of the team; productivity skyrockets.
        - Put the vision onto paper
        - Develop a vision communication strategy to connect the vision to the team
        - Allow the team to build on the vision and take ownership of it
    - **Health Team Culture –** allows the team to make decisions, not waste time on office politics, and accomplish more in less time.
        - Set expectations for a team culture based on trust and healthy conflict
        - Recognize individuals and the team for achievements and living out core values
        - Create opportunities to connect outside of work
    - **Clear Defined Roles and Expectation for Performance –** team members know what they are supposed to do, how their work supports the team, and how they contribute to the overall success of the team.
        - Identify the roles for the team based on market demands, leadership needs, and the vision
        - Lay out job descriptions with performance expectations and success indicators
        - Perform team assessment using strengths finder to identify the right person for each role
        - Set up a communication strategy to introduce the new roles to the team
    - **Everyone is Held Accountable –** in a culture of accountability, the focus is on the personal development of your team and results
        - Establish one-on-one coaching sessions with each team member
        - Hold regular formal performance reviews
        - Require team members to verbally report on specific projects, goals, and the action plans
    - **The Leader is an Example**
        - Work from leader's strengths-zone and trust others to do the same

- Provide High Impact team building opportunities
- Get into the trenches with the team and show them the leader cares

Some of the noticeable characteristics of a highly performing team are:
- Clear, communicated and recognised long-term goals
- Clear, communicated and accepted objectives
- Unqualified opportunities for success
- Tolerance for calculated risk
- Mutual appreciation for member's individual and broad skills
- Define, communicated and accepted roles
- Explicit, discussed and endorsed procedures
- Open, honest and continuous communication
- Supported leadership
- Commitment to delegation and accountability
- On-going access to constructive feedback and support
- Appropriate, tailored and timely rewards
- Opportunities for regular performance reviews

20. What information should be found in the project 'close-out report' and why? Discuss.

Not only do the project closing processes formally confirm the project has ended, they also provide an opportunity to review the project journey, to document (and hopefully institutionalise) the lessons learned, and to release all the organisational (and external) resources to pursue new endeavours (PMBOK 2012). These reviews should, in fact, form part of the project schedule to ensure they actually get done before everyone rushes for the departure gate, as it is crucial to not only know the project is finished but also that it had met all its objectives with comparisons made against each of the three baselines directing the project since inception—the (revised) scope, the schedule, and cost baselines.

Perhaps known more often as an administrative close, there are a number of given activities that could be performed here in support of project management integration, including:
- Confirmation that all outstanding work has been completed;
- Confirmation that all acceptance criteria nominated by the client have been met;
- Confirmation that all migration or transition procedures are in place; and
- Confirmation that all records have been collected, collated and archived.

Perhaps the best option may be to develop a closeout checklist to ensure that these, and other activities, are not missed at the end of the project

- Project performance – a thorough review of the substantive side of the project to compare what the project achieved with what the project tried to achieve.
- Administrative performance – a review of the administrative practices that helped or hindered the project.
- Organisational structure – a review of how the parent organisational structure aided or impeded the progress of the project.
- Project teams – a review that provides an opportunity to profile the performance of team members.
- Project management techniques – a review of the project management approach adopted throughout the project.

21. **What is procurement management planning and what benefits does it bring to any project? Discuss and provide examples to support your answer.**

The processes necessary to purchase or acquire products, services or results needed from outside the project team. It is a value-adding function that focuses on the efficient attainment of goods, services or results that deliver a number of very specific and measured benefits to the project.

Drivers of procurement:
- Supply the project with the goods and services as specified and as required
- Improved relationship with key suppliers
- Balance output with both value and quality
- Increase accountability in the supply chain
- Encourage greater access to innovative technology, premium materials, workplace competencies and expertise
- TBL and life cycle thinking

The 8 R's of procurement:
- Right price
- Right quantity
- Right quality (which should never be sacrificed)
- Right source
- Right reasons
- Right time
- Right return

22. **Explain how team conflict can have both positive and negative outcomes in a project. Provide examples to support your answer.**

Positive outcomes:
- Exploration of new ideas
- Consideration of other people's perspectives
- Adjustments/modifications made
- Clarification of different positions/interests
- Postponed decisions
- Time to Reconsider, clarify & communicates a Proposal

Negative Outcomes:
- Breakdown in communication
- Increased hostility
- Cessation of work on the project
- Legal action taken for contract breaches
- Project personnel being replaced

According to a reading, Robbins et al 2009, the highest level of group performance is when conflict is approximately medium level, as shown in the graph below. This type of conflict is considered 'functional', where the group was viable, self-critical and innovative. Without group conflict, the group was apathetic and stagnant, correlating to low performance. With too much conflict, the group was disruptive and uncooperative, correlating to low performance.

23. **Describe 5 ways to terminate a project and give examples**

- **Extinction:** Agreed decision to terminate regardless of success
- **Murder:** Silent decision
- **Inclusion:** Successful project institutionalised
- **Integration:** Elements of successful project redistributed
- **Starvation:** Budget cutbacks; Resource reallocation; Changing priorities
- Examples:

24. Explain the steps in risk management. Give examples for each step.

- **Identification:** Identify all internal & external sources of risk having the potential to impact the project (Eg. Use risk registers, historical research, project charter, feasibility studies to identify risks such as Internal or external risks such as ambiguous project charter or economic cycles)
- **Assessment:** Determine both the probability & impact arising from the risk source to calculate the priority (eg. Use 5 x 5 priority card)
- **Analysis:** Work through all tasks to clearly determine how each risk will impact the project's success (eg. Use SWOT or PESTELG analysis, consider issues impacting the situation. Impact analysis, scenario scheduling, contingency planning, financial modelling, sensitivity analysis, decision trees, stakeholder forums)
- **Management:** Plan the appropriate response strategies to accept, reject &/or manage the risk (Eg. Reject, Accept, Mitigate, Share, Transfer, Enhance or Exploit)
- **Evaluation:** Review the risk process & the adequacy of the nominated strategies post project (eg. Documenting the risk register)

25. List and describe 5 common Risk Analysis techniques

PERT: Program Evaluation & Review Technique (Network Diagram)

- Illustrates the project's logic and how it is tied together
- Shows the relationships between required tasks
- Shows the flow of work throughout the project
- Highlights where the critical path lies through the project
- Shows potential bottlenecks

SWOT: Strengths, Weaknesses, Opportunities, Threats
PESTELG: Political, Economic, Social, Technical, Environmental, Legal, Global
Risk Register: A document recording the risk event, probability, impact, priority, strategy and accountability for all project risks.
5 by 5 priority grid: A way of separating, raking and prioritising all the different levels of risk exposure by assigning risks a probability score and impact score to attain a priority score.
Decision Trees: considers possible paths and expects values returned.
Sensitivity analysis: considers demand, feasibility and take-ups.
Expert judgement: considers options, perspectives and viewpoints.
Scenario scheduling: considers alternative scheduling options.

26. Risk response strategies:

Negative Risks:

- Acceptance: of risk and impact on the project's outcome (eg. Accepting that your flight might be delayed, or your wedding reception rained out)
- Mitigation: taking specific action to reduce either the probability and/or impact of the risk (eg. Relocating the wedding indoors)
- Avoid: targeted response aimed at eliminating the threat to protect. (eg. Postponing the wedding to dry season)
- Transfer: transfer the impact of the threat together with ownership to a third party. (eg. Engaging a wedding planner)

Positive:

- Exploit: ensuring the opportunity is realised (eg. Using new technology to reduce the cost and duration required to complete project)
- Enhance: increase probably of event occurring (eg. Assigning additional resources to close out the project sooner)
- Share: share the responsibility of the risk (eg. Joint ventures where each group has expertise that other doesn't)
- Accept: be willing to take the opportunity is was to rise (eg. Being open to a funding partner is the situation arose later)

27. What is the WBS? List 5 Advantages and disadvantages

WBS: The Work Breakdown Structure decomposes the project.

- Identifies all required activities: What work must be performed?
- Determined the durations of activities: How long will each activity take?
- Determines who is needed or the resources for each activity: What resources can perform the work?
- Determines what budget is needed: How much investment is required?

Advantages:

- Captures tasks to complete the project
- Identifies task relationships
- Easy to read in the table format
- Makes possible to visualise a complex project
- Ties the project together

Disadvantages:

- Time consuming
- No timeline
- Potential inconsistency between table and effective schedule
- Potential discrepancy between projected and effective resources
- Some tasks may be constrained by factors other than predecessors

28. What is the difference between PERT and WBS?

29. **What is the scope of a project? It often changes over time. How do you balance involving stakeholders but also freeze the scope to still finish on time?**

Additional Notes:
Estimating Techniques (cost, time, etc.):
- Analogous estimating (history)
- Group decision making
- Resource unit rates
- Bottom-up
- Expert judgement
- Vendor bid analysis
- Three-point estimate
- Parametric

Other sequencing techniques:
- Finish-start
- Start-start
- Finish-finish
- Start-finish
- Fast-track
- Delay

Section C

1. **Describe the utilitarianism, deontology, and virtue-based approaches to Ethics.**
   Utilitarian: An action is judged as ethical or unethical based on the consequence or outcome. This is a future looking approach with the thinking that 'the end justifies the means'. It considers the action which has the greatest good for the greatest number.

   Issues:

   - minority rights at risk
   - who decides what 'good' is?
   - Assumes that the end justifies the means (regardless of the means)
   - Who decides what counts as the benefit and costs to be measured in cost-benefit analysis?
   - Can a standard measure be reached?
   - What counts as consequences?
   - How far into the future should we look?

   Examples:

   - Cost-benefit analysis
   - A pharmaceutical company releasing a new drug with a few side effects. The drug is beneficial to many people and side effects trouble a smaller amount.
   - Ford Pinto case: decision to not reposition fuel tank in vehicle design from a vulnerable position to collision due to cost-benefit analysis.

Deontological: Actions are judged as ethical standing along and without regard to consequence. This is a backward-looking, duty-based approach and the idea of 'means rather than ends'. Based on the idea that we are all morally obliged to follow fundamental rules and principles regardless of consequences.

Unconditional requirements:

1. Act as if, through your actions, you were making universal law for everyone to follow.
2. Always treat any human being (self-included) as an end in himself/herself, never as a means to an end.
3. Act as if you were a member of a community of fellow moral legislators who were ends in themselves.

Issues:

- Suppose that the impacts are known
- Is the list of principles to follow exhaustive?
- What if an individual has values over and above the set values?

Example:

- (video) Man turning down the promotion offer which required him to commit forgery as it when against principles.

Virtue-based: The focus is on the individual rather than on the action itself. It promotes the concept that individuals should seek to live a virtuous life. This is a subjective and individual looking approach. The idea that the art of making good or sound decision involves the exercise of judgement. We are not born virtuous but become virtuous by practise – ethics can be taught, but ethical conduct cannot, it must be practised. The possession and development of a good character of the moral virtues will lead the person to do the right thing.

2. **What are five key principles in the ethics codes for engineers?**

3. **What is a code of ethics? Discuss the limitations of a code of ethics and provide examples to substantiate your answer**

Code of Ethics:

Code of ethics state the moral responsibilities of professionals as seen by the profession and as represented by a professional society. It functions as a commitment by the profession as a whole, that engineers will serve the public health, safety and welfare. The code should only be a starting point for ethical behaviour.

Role of the Code of ethics for engineers:

1) Serving and protecting the public: the professionals stand in a fiduciary relationship with the public and hence, trust and trustworthiness are essential.
2) Guidance: codes provide helpful guidance by articulating the main obligations of engineers.
3) Inspiration: they provide a positive stimulus for ethical conducts as inspired by the collective commitment

4) Shared standards: the diversity of moral viewpoints among individual engineers makes it essential that professionals establish explicit standards
5) Support for responsible professional: gives positive support to professionals seeking to act ethically
6) Education and mutual understanding: encourages a shared understanding among professionals
7) Deterrence and discipline: Professional societies do suspend or expel members whose professional conduct has been proven unethical.
8) Contributing to the profession's image: is essential for sustaining the trust of the public

What they can do

- help to find answers
- protect against pressure to compromise privacy
- Tell what the professional standards of behaviour are

What they cannot do

- cannot force ethical behaviour
- cannot give the answers
- They are not a panacea

Limitations:

- No substitute for individual responsibilities in dealing with real world ethical dilemmas
- Codes may include only general wording leaving areas of vagueness
- Despite the value of guiding professional conduct, codes are not always the complete and final word

4. **What are the benefits of managing a project ethically? Discuss and provide examples to support your answer.**
   - Cultivate strong teamwork and productivity – Ongoing attention and dialogue regarding values in a project builds openness and integrity. The team feels strong alignment between their values and other organization, with strong motivation and performance.
   - Support the team growth and meaning – team members feel full confidence they can admit and deal with whatever comes their way.
   - Help manage values associated with quality management, strategic planning and diversity management – Total quality management includes high priority on certain operating values, e.g., trust among stakeholders, performance, reliability, measurement, and feedback. Ethics management techniques are highly useful for managing strategic values, as well as in managing diversity which is acknowledged as different values and perspectives.
   - Promote a strong public image - an organization regularly gives attention to its ethics can represent a strong positive to the public.

5. **What are the 5 key stakeholders and their basic ethically requirements to each other?**
Sponsor (client/owner)
Project Organisation

Project management office
Project steering committee
Portfolio manager
Program manager
Project manager
Project team

6. **List the 5 key stakeholder groups and their ethical values**
   a) **Clients:**
   b) **Project Steering Group:**
   c) **Sponsors:**
   d) **Team:**
   e) **Manager:**

7. **What are the strengths and weaknesses of the 'utilitarian' (or consequences based) ethical theory? Discuss and provide an example to support your answer.**

8. **What are the strengths and weaknesses of the virtue-based ethical theory? Discuss**

9. **What are the strengths and weaknesses of the 'Deontological' ethical theory? Discuss and provide an example to support your answer.**

10. Describe how sustainable development relates to ethics
11. What is the line drawing approach?

12. What is the difference between a transactional leader and transformational leader? Provide examples

13. **What are the key attributes of an ethical project manager? Discuss and provide examples to substantiate your answer.**

   Attributes of an ethical manager/leader:

   1. Lead by example
   2. Being ethical and honest at all times, obeying to wide loyalty and integrity principles
      a. Telling the truth
      b. Admitting failure
      c. Communicating shared ethical values to employees
      d. Rewarding employees who behave ethically and punish those who don't
      e. Protecting employees who bring to light unethical behaviours or raise ethical issues
   3. Establish codes of ethics and decision rules
   4. Hire individuals with high ethical standards
   5. Have all levels of management continually reaffirm the importance of code of ethics and the organisations commitment to the code

6. Provide ethics training

Transactional leaders: guide or motivate their followers to work towards established goals by exchanging rewards for their productivity. (managing)

Transformational leaders: stimulate and inspire followers to transcend their own self-interests for the good of the organisation to achieve extraordinary outcomes. (leading)

- Create strategic vision
- Communicate the vision
- Model the vision
- Build commitment towards the vision

14. Who are value-based project leaders? How do they help in thinking about putting ethics and leadership together?

15. What are the 7 stages of the Ethical Cycle?
1) Case
2) Moral problem statement
3) Problem analysis: clear identification of relevant elements (stakeholders, moral values involved)
4) Options for action: all possible options identified
5) Ethical judgement: thorough application of moral concepts, ethical theories, models and frameworks.
6) Reflection: reflect on the outcomes of the previous stage
7) Morally accepted actions: actions chosen to solve ethical dilemma.

16. Discuss the universal moral values for corporate codes of ethics.

Universal moral values are generated by considering three sources:

a) Corporate codes of ethics
b) Global codes of ethics
c) Business ethics literature

Based on the convergence of the three sources of standards, six moral values of corporate codes of ethics are proposed:

1. Trustworthiness – Integrity, honesty, loyalty, transparency
2. Respect – for human rights
3. Responsibility – accountability, self-restraints
4. Fairness – equity
5. Caring – no harm
6. Citizenship – TBL, obeying the law

17. What is the UN Global Compact's ten principles?

The UN Global Compact's ten principles:

1) Human rights:
   a) Business should support and respect the protection of internationally proclaimed human rights.
   b) Make sure that they are not complicit in human rights abuses.
2) Labour:
   a) Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining.
   b) The elimination of all forms of forced and compulsory labour.
   c) The effective abolition of child labour.
   d) The elimination of discrimination in respect of employment and occupation.
3) Environment:
   a) Businesses should support a precautionary approach to environmental challenges.
   b) Undertake initiatives to promote greater environmental responsibility.
   c) Encourage the development and diffusion of environmentally friendly technologies.
4) Anti-Corruption:
   a) Businesses should work against corruption in all its forms, including extortion and bribery.

Sometimes conflict among various ethical principles that imply different and sometimes competing positions. The number of conflicts increases as the number of stakeholders increases.

Tests of ethics:

1. Legal test: does the action violate law?
2. Duties test: is the action contrary to widely accepted moral obligations?
3. Consequence test: is it likely that any major damages to people or organisations will result from the contemplated actions?
4. Utilitarian test: is there a satisfactory alternative action that produces equal or greater benefits to the parties affected that the proposed action?
5. Special obligations test: does the action violate any other special duties
6. Motives test: is the intent of the contemplated action harmful?
7. Rights test: does the contemplated action infringe upon rights of consumer in any way
8. Justice test: does the contemplated action leave another person less well-off?
9. Sustainable test: can the contemplated action be considered sustainable in that is does not negatively impact upon future generations?

Ethical Dilemmas:
- A cafeteria in an office building has comfortable tables and chairs but they invite people to linger for too long. You are asked to design uncomfortable chairs to discourage lingering.
- A project manager's boss orders for a violation tag to be removed from faulty equipment as he views the situation as a minor infraction and doesn't want the project to be delayed as a result. -

- Whistle-blowing

Possible ethical problems:

1. Conceptual task (eg. Unrealistic assumption, untrue feasibility studies, test of prototype done only under most favourable conditions)
2. Design (eg. Design changes not carefully checked, lack of risk identification and management plan)
3. Manufacture (eg. Promise of unrealistic completion date, inadequate testing of purchased parts)
4. Implementation (eg. No formal procedure for following project/product effects on society and environment)
5. Final task (eg. Lack of attention to ultimate product disposal, fail to provide public notification of hazards)

Why Ethics: 3

- Moral awareness
- Moral reasoning
- Moral coherence
- Moral imagination
- Moral communication
- Moral reasonableness
- Respect for people
- Tolerance and diversity
- Moral hope
- Integrity and honesty
- Growing social movement that has led to increased social expectations
- Regulatory control: protection of workers, consumers, citizens, stakeholder and environment rights
- Sustainable business engineering
- Strongly related to TBL

The line drawing approach (dealing with the grey area of ethics): spectrum of choices from the positive paradigm (morally acceptable) to the negative paradigm (not moral acceptable). A choice they may appear to be morally acceptable may not be the best choice.

Stages of moral development:

1 and 2. Pre-conventional morality – self interest

3 and 4. Conventional morality – interest in friends, family and associates.

5, 6 and 7. Post-conventional morality – a concern for social justice and collective well being (TBL)

Managing Cross Cultural Business Ethics:

4 perspectives framework (not mutually exclusive):

1. Follow the norms of the home country because that is the patriotic thing to do

2. Follow the norms of the host country to show proper respect for the host country's culture.
3. Follow whichever norm is most profitable
4. Follow whichever norm is morally best.

5 norms that should be implemented:

1. Do no intentional direct harm
2. If the project is morally justified, it should benefit the host country
3. Respect the human rights of the workers, consumers, and all others in the host country
4. Promote the development of just background institutions
5. Respect the laws of a host country and well as it's culture and local values.

6 universal moral values:

1. Trustworthiness
2. Respect
3. Responsibility
4. Fairness
5. Caring
6. Citizenship

Executive integrity: a breaking out of a narrow individualism and it based on a fearless trust in what true dialogue and understanding might bring, both new responsibilities and new forms of responsiveness to the other.

Limits of manager/leader's ethics:

- Where do they place their loyalty?
- Where do they seek to show integrity and where do they not?
- Loyalty and Integrity may conflict: integrity demands sacrifice of things, loyalty is the sacrificing of integrity to obtain things. (eg. Integrity – a person will tell the manager of the wrongdoing and try to convince them to put things right, loyalty – a person will offer to cover up the organisation)