

GUJARAT TECHNOLOGICAL UNIVERSITY

BE-6 SEMESTER – OLD PAPER – S22 TO W25 – QUESTION BANK

Subject Name & Code:

SYSTEMS ENGINEERING (3161013)

Unit 1: Fundamentals of Systems Engineering, Discipline specific Engineering Standards

Repeated Questions:

1. **Compare/contrast Systems Engineering and Traditional Engineering.**
(W25 - Q1a, 07 marks)
(S25 - Q1c, 07 marks)
(S22 - Q1b, 04 marks)
(S23 - Q1b, Not specified)
(S24 - Q3b, 04 marks)
(W22 - Q1b, 04 marks)
2. **Define Systems Engineering / List definitions.**
(W25 - Q1a, 03 marks)
(W23 - Q1a, 03 marks)
(S22 - Q1a, 03 marks)
(W24 - Q1a, 03 marks)
(S23 - Q1a, Not specified)
3. **Explain the importance/power of Systems Engineering with an example.**
(S22 - Q1b, 04 marks)
(S24 - Q4b, 04 marks)
(S25 - Q5c, 07 marks)
4. **Explain Systems Engineering Management (SEM/SEMP).**
(W25 - Q3c, 07 marks)
(W23 - Q3c, 07 marks)
(W24 - Q3c, 07 marks)
(S22 - Q1c, 07 marks)
(S23 - Q1c, Not specified)
(S24 - Q2c OR, 07 marks)
(W22 - Q2c OR, 07 marks)
5. **Explain the System Life Cycle / Project Life Cycle / its phases.**
(W25 - Q1c, 07 marks)
(W23 - Q1c, 07 marks)
(S22 - Q3a, 03 marks)
(S23 - Q2c, Not specified)
(W22 - Q1c, 07 marks)
(S25 - Q2c OR, 07 marks)

Other Important Questions:

1. **What is Systems Engineering? State two contrasts between systems engineering and traditional engineering.** (W25 - Q1a, 03 marks)
2. **Explain any one example of a complex system where system engineering is needed in brief.** (W25 - Q1b, Not specified)
3. **List key milestones in the history of systems engineering.** (S25 - Q1a, 03 marks)
4. **Explain the concept of system lifecycle in systems engineering in brief.** (S25 - Q1b, 04 marks)

5. **Define system engineering and give example of it.** (W23 - Q1a, 03 marks)
 6. **Give the comparison between following two systems perspectives: systems thinking and systems engineering.** (W23 - Q1b, 04 marks)
 7. **Explain the project life cycle in detail.** (W23 - Q1c, 07 marks)
 8. **Define various system Engineering definitions.** (S22 - Q1a, 03 marks)
 9. **Explain power of system engineering.** (S22 - Q1b, 04 marks)
 10. **Discuss SE as a profession.** (S22 - Q1c, 07 marks)
 11. **State three definitions of Systems Engineering.** (W24 - Q1a, 03 marks)
 12. **List the essential characteristics of a successful Systems Engineer professional.** (W24 - Q1b, 04 marks)
 13. **Justify the importance of requirement and need analysis in complex system engineering. List all activities done under this phase.** (W24 - Q1c, 07 marks)
 14. **Define system engineering. Give examples of systems requiring system engineering.** (S23 - Q1a, Not specified)
 15. **Describe the difference between traditional Engineering and SE.** (S23 - Q1b, Not specified)
 16. **Explain in brief Systems Engineering Management.** (S23 - Q1c, Not specified)
 17. **List and Explain any two Engineering standards.** (S24 - Q1a, 03 marks)
 18. **Explain Fundamentals of Systems Engineering.** (S24 - Q1b, 04 marks)
 19. **Explain Systems Engineering: History and Examples in detail.** (S24 - Q1c, 07 marks)
 20. **Explain how System Engineering as Profession built?** (S24 - Q2b, 04 marks)
 21. **Define a system.** (W22 - Q1a, 03 marks)
 22. **Describe the difference between traditional Engineering and Systems.** (W22 - Q1b, 04 marks)
 23. **Explain all phases of System Life Cycle.** (W22 - Q1c, 07 marks)
-

Unit 2: Complex System Structure

Repeated Questions:

1. **Explain complex system hierarchy.**
(W25 - Q2a, 03 marks)
(S25 - Q2b, 04 marks)
(S22 - Q5a OR, 03 marks)
(S23 - Q2b, Not specified)
(S24 - Q4a, 03 marks)
(W22 - Q2b, 04 marks)
2. **Explain system interfaces and interactions.**
(W25 - Q2b, 04 marks)
(S22 - Q2c, 07 marks)
(S24 - Q2c, 07 marks)
(S25 - Q3c, 07 marks)
3. **Explain system environment and system boundaries.**
(W25 - Q3a, 03 marks)
(S22 - Q2c OR, 07 marks)
(S25 - Q3c, 07 marks)
(S24 - Q4c, 07 marks)

Other Important Questions:

1. **List the activities included under all four stages of needs and requirement analysis.** (W25 - Q2c, 07 marks)
 2. **Write a short note on Model Based Systems Engineering (MBSE).** (W25 - Q2c OR, 07 marks)
 3. **List the main evolutionary characteristics of complex systems in brief.** (S25 - Q2a, 03 marks)
 4. **Explain in brief Systems Engineering Management.** (S25 - Q2c, 07 marks)
 5. **Which are three basic entities that constitute media on which systems operate?** (W23 - Q2a, 03 marks)
 6. **What are the sub divisions of information elements? Explain those divisions.** (W23 - Q2b, 04 marks)
 7. **What do you understand by system design hierarchy? Explain it with example.** (W23 - Q2c, 07 marks)
 8. **Explain the spiral model of system life cycle.** (W23 - Q2c OR, 07 marks)
 9. **Give any one example of complex system where system engineering is needed and explain it.** (S22 - Q2a, 03 marks)
 10. **Compare System Engineering and traditional engineering.** (S22 - Q2b, 04 marks)
 11. **Explain the concept of hierarchy in complex systems using a detailed example of any signal and data System.** (W24 - Q2c OR, 07 marks)
 12. **Explain types of interface elements in complex systems with necessary examples.** (W24 - Q2b, 04 marks)
 13. **Define critical path method (CPM) in project management.** (S23 - Q2a, Not specified)
 14. **Explain principal stages in a system life cycle.** (S23 - Q2c, Not specified)
 15. **Explain Work breakdown structure (WBS) in detail.** (S23 - Q2c OR, Not specified)
 16. **Explain system risk management.** (S24 - Q2a, 03 marks)
 17. **What is lifecycle integration?** (W22 - Q2a, 03 marks)
-

Unit 3: Systems Development Management

Repeated Questions:

1. **Explain Work Breakdown Structure (WBS) – definition, benefits, need.**
(W25 - Q3c, 07 marks)
(W23 - Q3c, 07 marks)
(S22 - Q3c, 07 marks)
(W24 - Q3c, 07 marks)
(S23 - Q2c OR, Not specified)
(S24 - Q3c, 07 marks)
(W22 - Q2c, 07 marks)
2. **Explain Systems Engineering Management Plan (SEMP).**
(W25 - Q3c, 07 marks)
(W23 - Q3c, 07 marks)
(W24 - Q3c, 07 marks)
3. **Explain system requirement types.**
(W25 - Q3b, 04 marks)
(S22 - Q3c, 07 marks)
4. **Explain need/requirement analysis.**
(W24 - Q1c, 07 marks)
(W23 - Q3a, 03 marks)
(W22 - Q3a, 03 marks)

Other Important Questions:

1. **Explain following terms in brief; also state its importance in life cycle system engineering. (i) PERT (ii) PDR (iii) CDR.** (W25 - Q3a, 03 marks)
2. **Briefly discuss concept exploration phase in the system life cycle.** (W25 - Q3b, 04 marks)
3. **Explain the purpose of a Work Breakdown Structure (WBS) in project management.** (S25 - Q3a, 03 marks)
4. **Describe how a Systems Engineering Management Plan (SEMP) supports the development of a system.** (S25 - Q3b, 04 marks)
5. **List the key components of systems risk management.** (S25 - Q3a, 03 marks)
6. **Describe the difference between need analysis and need validation.** (S25 - Q3b, 04 marks)
7. **What is rapid prototyping?** (W23 - Q3a, 03 marks)
8. **List out the most common methods of dealing with program risk.** (W23 - Q3b, 04 marks)
9. **Write a note on system engineering management plan (SEMP).** (W23 - Q3c, 07 marks)
10. **Briefly explain need analysis phase.** (W23 - Q3a, 03 marks)
11. **Explain the analysis pyramid used for analysis purpose.** (W23 - Q3b, 04 marks)
12. **Write a note on work breakdown structures (WBS).** (W23 - Q3c, 07 marks)
13. **List major system development characteristics.** (S22 - Q3b, 04 marks)
14. **Explain system risk management.** (S22 - Q3a OR, 03 marks)
15. **Describe Requirement analysis schematic in detail.** (S22 - Q3b OR, 04 marks)
16. **Justify the role of Critical Path Method in project scheduling.** (W24 - Q2a, 03 marks)
17. **Define 'MOE' and 'MOP'.** (W24 - Q3a, 03 marks)
18. **Write a short note on design synthesis processes.** (W24 - Q3b, 04 marks)
19. **Define Preliminary Design Review (PDR) and Critical Design Review (CDR).** (W24 - Q3a, 03 marks)
20. **Briefly discuss activities under each substage of the concept development stage.** (W24 - Q3b, 04 marks)
21. **Define the term "functional allocation".** (S23 - Q3a, Not specified)
22. **Differentiate the terms "concept selection" and "concept validation".** (S23 - Q3b, Not specified)
23. **Write a short note on Model Based Systems Engineering (MBSE).** (S23 - Q3c, Not specified)
24. **Explain system risk management in brief.** (S23 - Q3a OR, Not specified)

25. **Explain functional analysis in brief.** (S23 - Q3b OR, Not specified)
26. **Explain concept exploration phase in the system life cycle.** (S23 - Q3c OR, Not specified)
27. **Explain Hypothesis testing in detail.** (S24 - Q3a, 03 marks)
28. **What is Lifecycle Integration? Explain it in detail.** (S24 - Q3b, 04 marks)
29. **Briefly demonstrate real life systems by the Indian Army.** (S24 - Q3a OR, 03 marks)
30. **Compare System Engineering and traditional engineering.** (S24 - Q3b OR, 04 marks)
31. **How probability data analysis carried out?** (S24 - Q3c OR, 07 marks)
32. **What is requirement analysis?** (W22 - Q3a, 03 marks)
33. **Describe Systems risk management.** (W22 - Q3b, 04 marks)
34. **Explain the concept stage of system lifecycle.** (W22 - Q3c, 07 marks)
35. **What is need analysis?** (W22 - Q3a OR, 03 marks)
36. **Explain functional analysis in brief.** (W22 - Q3b OR, 04 marks)
37. **Explain Model based Systems Engineering (MBSE).** (W22 - Q3c OR, 07 marks)

Unit 4: Engineering Concept Stage

Repeated Questions:

1. **Explain Model-Based Systems Engineering (MBSE).**

(W25 - Q2c OR, 07 marks)

(W23 - Q4a, 03 marks)

(S25 - Q4c, 07 marks)

(S25 - Q4c OR, 07 marks)

(W24 - Q4c, 07 marks)

(S23 - Q3c, Not specified)

(S24 - Q4a, 03 marks)

(W22 - Q3c OR, 07 marks)

2. **Explain Trade-off Analysis / Trade studies.**

(W25 - Q4a, 03 marks)

(W24 - Q4a, 03 marks)

(S23 - Q4a, Not specified)

(W22 - Q4a, 03 marks)

3. **Explain the concept exploration phase / concept stage.**

(W25 - Q3b, 04 marks)

(S22 - Q4b, 04 marks)

(S25 - Q5b, 04 marks)

(W22 - Q3c, 07 marks)

Other Important Questions:

1. **Explain system environment and system boundaries in brief.** (W25 - Q3a, 03 marks)
2. **Explain Systems Engineering Management Plan (SEMP).** (W25 - Q3c, 07 marks)
3. **Write a note on Trade-off Analysis.** (W25 - Q4a, 03 marks)
4. **Write a short note on Systems Modeling Languages.** (W25 - Q4b, 04 marks)
5. **Explain design synthesis processes in detail.** (W25 - Q4c, 07 marks)
6. **List the main components of systems architecture.** (S25 - Q4a, 03 marks)
7. **Describe the role of systems architecture in organizing and structuring complex systems.** (S25 - Q4b, 04 marks)
8. **Define Model-Based Systems Engineering (MBSE) and how does it improve systems engineering processes.** (S25 - Q4c, 07 marks)
9. **Explain two development stages and one application stage in system life cycle stages in brief.** (S25 - Q4a OR, 03 marks)
10. **Describe functional analysis - Top down process.** (S25 - Q4b OR, 04 marks)
11. **Explain Model based Systems Engineering (MBSE).** (S25 - Q4c OR, 07 marks)
12. **Explain briefly about model based systems engineering (MBSE).** (W23 - Q4a, 03 marks)
13. **What is test and evaluation master plan (TEMP)?** (W23 - Q4b, 04 marks)
14. **Draw and explain the concept exploration phase flow diagram.** (W23 - Q4c, 07 marks)
15. **What is risk reduction?** (W23 - Q4a OR, 03 marks)
16. **Explain prototype development as a risk mitigation technique.** (W23 - Q4b OR, 04 marks)
17. **Draw and explain the concept definition phase flow diagram.** (W23 - Q4c OR, 07 marks)
18. **Brief two development stages and one application stage in system life cycle stages.** (S22 - Q4a, 03 marks)
19. **Describe concept stage in detail.** (S22 - Q4b, 04 marks)
20. **Explain importance of system engineering with one example.** (S22 - Q4c, 07 marks)
21. **Define redundancy in engineering design stage.** (S22 - Q4a OR, 03 marks)
22. **Describe major three activities of SE Management.** (S22 - Q4b OR, 04 marks)
23. **Explain Engineering development phase with example.** (S22 - Q4c OR, 07 marks)
24. **Write a short note on Trade-off Analysis.** (W24 - Q4a, 03 marks)
25. **List four pros and cons (two of each) of incorporating some of the latest technology into the development of a new complex system.** (W24 - Q4b, 04 marks)

26. **Write a detailed note on Model Based Systems Engineering (MBSE) approaches.** (W24 - Q4c, 07 marks)
 27. **What is rapid prototyping? Discuss prototype development as a risk mitigation technique.** (W24 - Q4a OR, 03 marks)
 28. **List differences between Unified Modelling Language (UML) and SysML (Systems Modelling Language).** (W24 - Q4b OR, 04 marks)
 29. **Explain (i) risk assessment (ii) risk likelihood and (iii) risk criticality with reference to risk management in systems engineering.** (W24 - Q4c OR, 07 marks)
 30. **Explain trade studies.** (S23 - Q4a, Not specified)
 31. **Explain Product Implementation process in brief.** (S23 - Q4b, Not specified)
 32. **Explain the concept of User Interface Design (UID).** (S23 - Q4c, Not specified)
 33. **Define the term Preliminary Design Review (PDR).** (S23 - Q4a OR, Not specified)
 34. **Explain the concept of risk reduction.** (S23 - Q4b OR, Not specified)
 35. **Explain importance of system engineering with one example.** (S23 - Q4c OR, Not specified)
 36. **Explain Model Based Systems Engg (MBSE) for Decision making in detail.** (S24 - Q4a, 03 marks)
 37. **Explain power of system engineering.** (S24 - Q4b, 04 marks)
 38. **Explain importance of system engineering with one example.** (S24 - Q4c, 07 marks)
 39. **Explain complex system hierarchy.** (S24 - Q4a OR, 03 marks)
 40. **Describe major three activities of SE Management.** (S24 - Q4b OR, 04 marks)
 41. **Explain system environment and system boundaries in detail.** (S24 - Q4c OR, 07 marks)
 42. **What are trade studies?** (W22 - Q4a, 03 marks)
 43. **Explain Product Implementation process in brief.** (W22 - Q4b, 04 marks)
 44. **Explain the model for engineering development phase.** (W22 - Q4c, 07 marks)
 45. **What is specialty engineering?** (W22 - Q4a OR, 03 marks)
 46. **Explain Product Validation process in brief.** (W22 - Q4b OR, 04 marks)
 47. **Explain design synthesis processes in detail.** (W22 - Q4c OR, 07 marks)
-

Unit 5: Engineering Development Stage

Repeated Questions:

1. **Explain prototype development for risk mitigation.**
(W25 - Q4a, 03 marks)
(W23 - Q4b OR, 04 marks)
(W24 - Q4a OR, 03 marks)
2. **Explain hypothesis testing in Systems Engineering.**
(W25 - Q4b, 04 marks)
(S24 - Q3a, 03 marks)
(S23 - Q5b, Not specified)

Other Important Questions:

1. **Justify the need of prototype development for risk mitigation.** (W25 - Q4a, 03 marks)
2. **Discuss role of hypothesis testing in Systems Engineering.** (W25 - Q4b, 04 marks)
3. **Explain the model for engineering development phase.** (W25 - Q4c, 07 marks)
4. **Define modular maintainability, availability and redundancy.** (S25 - Q5a, 03 marks)
5. **Describe concept stage in detail.** (S25 - Q5b, 04 marks)
6. **Explain Product Verification process in detail.** (S25 - Q5c, 07 marks)
7. **Explain System Operation Process in brief.** (S25 - Q5a OR, 03 marks)
8. **Describe the techniques to increase reliability.** (S25 - Q5b OR, 04 marks)
9. **Explain importance of system engineering with one example.** (S25 - Q5c OR, 07 marks)
10. **Which are the techniques to increase reliability?** (W23 - Q5b, 04 marks)
11. **Give the parallels between the system development and test & evaluation planning.** (W23 - Q5c, Not specified)
12. **What do you understand by in service support?** (W23 - Q5a OR, 03 marks)
13. **Which are the key elements of production plan?** (W23 - Q5b OR, 04 marks)
14. **Give the essential features of effective operational evaluation.** (W23 - Q5c OR, 07 marks)
15. **Discuss transition from development to production.** (S22 - Q5a, 03 marks)
16. **Describe functional analysis - Top down process.** (S22 - Q5b, 04 marks)
17. **Describe Integration, testing and evaluation of Total system in detail.** (S22 - Q5c, 07 marks)
18. **Explain complex system hierarchy.** (S22 - Q5a OR, 03 marks)
19. **Briefly demonstrate real life systems by the Indian Army.** (S22 - Q5b OR, 04 marks)
20. **Explain engineering design stage in detail.** (S22 - Q5c OR, 07 marks)
21. **Explain Design synthesis in brief.** (S23 - Q5a, Not specified)
22. **Discuss hypothesis testing in engineering.** (S23 - Q5b, Not specified)
23. **Explain Product Verification process in detail.** (S23 - Q5c, Not specified)
24. **Discuss transition from development to production.** (S23 - Q5a OR, Not specified)
25. **Explain the Concepts of reliability and redundancy for a system.** (S23 - Q5b OR, Not specified)
26. **Explain the concept of system integration.** (S23 - Q5c OR, Not specified)
27. **Give any one example of complex system where system engineering is needed and explain it.** (S24 - Q5a, 03 marks)
28. **Define redundancy in engineering design stage.** (S24 - Q5b, 04 marks)
29. **Explain the Concepts of maintainability, availability, predictability.** (S24 - Q5c, 07 marks)
30. **Explain Test planning and preparation in detail.** (S24 - Q5a OR, 03 marks)
31. **Describe functional analysis - Top down process.** (S24 - Q5b OR, 04 marks)
32. **Describe Integration, testing and evaluation of Total system in detail.** (S24 - Q5c OR, 07 marks)
33. **What is design synthesis?** (W22 - Q5a, 03 marks)
34. **Explain System Maintenance Process in brief.** (W22 - Q5b, 04 marks)
35. **Explain Integration, Verification and Validation of a system.** (W22 - Q5c, 07 marks)
36. **What is system integration?** (W22 - Q5a OR, 03 marks)

37. **Explain System Operation Process in brief.** (W22 - Q5b OR, 04 marks)
38. **Explain Product Verification process in detail.** (W22 - Q5c OR, 07 marks)
-

Unit 6: Engineering Design Stage

Repeated Questions:

1. **Explain the concepts of reliability, redundancy, maintainability, availability, predictability.**
(W25 - Q5a, 03 marks)
(S25 - Q5a, 03 marks)
(S24 - Q5c, 07 marks)
(W24 - Q3c OR, 07 marks)
2. **Explain transition from development to production.**
(W25 - Q5b, 04 marks)
(S22 - Q5a, 03 marks)
(S23 - Q5a OR, Not specified)
(W24 - Q3b OR, 04 marks)
3. **Explain system integration.**
(W25 - Q5c, 07 marks)
(S23 - Q5c OR, Not specified)

Other Important Questions:

1. **Explain concept of redundancy in design engineering design.** (W25 - Q5a, 03 marks)
2. **Discuss transition from development to production.** (W25 - Q5b, 04 marks)
3. **Explain the concept of system integration in detail.** (W25 - Q5c, 07 marks)
4. **Explain concept of predictability in design engineering design.** (W25 - Q5a OR, 03 marks)
5. **Explain System Maintenance Process in brief.** (W25 - Q5b OR, 04 marks)
6. **Explain Verification and Validation of a system in detail.** (W25 - Q5c OR, 07 marks)
7. **Define modular maintainability, availability and redundancy.** (S25 - Q5a, 03 marks)
8. **Describe concept stage in detail.** (S25 - Q5b, 04 marks)
9. **Explain Product Verification process in detail.** (S25 - Q5c, 07 marks)
10. **Explain System Operation Process in brief.** (S25 - Q5a OR, 03 marks)
11. **Describe the techniques to increase reliability.** (S25 - Q5b OR, 04 marks)
12. **Explain importance of system engineering with one example.** (S25 - Q5c OR, 07 marks)
13. **Discuss transition from development to production.** (S22 - Q5a, 03 marks)
14. **Describe functional analysis - Top down process.** (S22 - Q5b, 04 marks)
15. **Describe Integration, testing and evaluation of Total system in detail.** (S22 - Q5c, 07 marks)
16. **Explain complex system hierarchy.** (S22 - Q5a OR, 03 marks)
17. **Briefly demonstrate real life systems by the Indian Army.** (S22 - Q5b OR, 04 marks)
18. **Explain engineering design stage in detail.** (S22 - Q5c OR, 07 marks)
19. **Write a short note on User Interface Design (UID).** (W24 - Q3a, 03 marks)
20. **Explain System Maintenance Process in brief.** (W24 - Q3b, 04 marks)
21. **Discuss the concept of integration testing and its importance in complex systems. List the activities done under integration testing.** (W24 - Q3c, 07 marks)
22. **Explain Verification and Validation of a system in brief.** (W24 - Q3a OR, 03 marks)
23. **Discuss transition from development to production phase.** (W24 - Q3b OR, 04 marks)
24. **Explain the concept of availability, redundancy, and predictability in the engineering design stage.** (W24 - Q3c OR, 07 marks)
25. **Explain Design synthesis in brief.** (S23 - Q5a, Not specified)
26. **Discuss hypothesis testing in engineering.** (S23 - Q5b, Not specified)
27. **Explain Product Verification process in detail.** (S23 - Q5c, Not specified)
28. **Discuss transition from development to production.** (S23 - Q5a OR, Not specified)
29. **Explain the Concepts of reliability and redundancy for a system.** (S23 - Q5b OR, Not specified)
30. **Explain the concept of system integration.** (S23 - Q5c OR, Not specified)
31. **Give any one example of complex system where system engineering is needed and explain it.** (S24 - Q5a, 03 marks)

32. **Define redundancy in engineering design stage.** (S24 - Q5b, 04 marks)
 33. **Explain the Concepts of maintainability, availability, predictability.** (S24 - Q5c, 07 marks)
 34. **Explain Test planning and preparation in detail.** (S24 - Q5a OR, 03 marks)
 35. **Describe functional analysis - Top down process.** (S24 - Q5b OR, 04 marks)
 36. **Describe Integration, testing and evaluation of Total system in detail.** (S24 - Q5c OR, 07 marks)
 37. **What is design synthesis?** (W22 - Q5a, 03 marks)
 38. **Explain System Maintenance Process in brief.** (W22 - Q5b, 04 marks)
 39. **Explain Integration, Verification and Validation of a system.** (W22 - Q5c, 07 marks)
 40. **What is system integration?** (W22 - Q5a OR, 03 marks)
 41. **Explain System Operation Process in brief.** (W22 - Q5b OR, 04 marks)
 42. **Explain Product Verification process in detail.** (W22 - Q5c OR, 07 marks)
-

Unit 7: Integration, Testing and Evaluation of Total System

Repeated Questions:

1. **Explain Integration, Verification and Validation (V&V) of a system.**
(W25 - Q5c OR, 07 marks)
(S22 - Q5c, 07 marks)
(W22 - Q5c, 07 marks)
2. **Explain Product Verification process.**
(S25 - Q5c, 07 marks)
(S23 - Q5c, Not specified)
(W22 - Q5c OR, 07 marks)
3. **Explain System Maintenance Process.**
(W25 - Q5b OR, 04 marks)
(W24 - Q3b, 04 marks)
(W22 - Q5b, 04 marks)

Other Important Questions:

1. **Explain concept of redundancy in design engineering design.** (W25 - Q5a, 03 marks)
2. **Discuss transition from development to production.** (W25 - Q5b, 04 marks)
3. **Explain the concept of system integration in detail.** (W25 - Q5c, 07 marks)
4. **Explain concept of predictability in design engineering design.** (W25 - Q5a OR, 03 marks)
5. **Explain System Maintenance Process in brief.** (W25 - Q5b OR, 04 marks)
6. **Explain Verification and Validation of a system in detail.** (W25 - Q5c OR, 07 marks)
7. **Define modular maintainability, availability and redundancy.** (S25 - Q5a, 03 marks)
8. **Describe concept stage in detail.** (S25 - Q5b, 04 marks)
9. **Explain Product Verification process in detail.** (S25 - Q5c, 07 marks)
10. **Explain System Operation Process in brief.** (S25 - Q5a OR, 03 marks)
11. **Describe the techniques to increase reliability.** (S25 - Q5b OR, 04 marks)
12. **Explain importance of system engineering with one example.** (S25 - Q5c OR, 07 marks)
13. **Discuss transition from development to production.** (S22 - Q5a, 03 marks)
14. **Describe functional analysis - Top down process.** (S22 - Q5b, 04 marks)
15. **Describe Integration, testing and evaluation of Total system in detail.** (S22 - Q5c, 07 marks)
16. **Explain complex system hierarchy.** (S22 - Q5a OR, 03 marks)
17. **Briefly demonstrate real life systems by the Indian Army.** (S22 - Q5b OR, 04 marks)
18. **Explain engineering design stage in detail.** (S22 - Q5c OR, 07 marks)
19. **Write a short note on User Interface Design (UID).** (W24 - Q3a, 03 marks)
20. **Explain System Maintenance Process in brief.** (W24 - Q3b, 04 marks)
21. **Discuss the concept of integration testing and its importance in complex systems. List the activities done under integration testing.** (W24 - Q3c, 07 marks)
22. **Explain Verification and Validation of a system in brief.** (W24 - Q3a OR, 03 marks)
23. **Discuss transition from development to production phase.** (W24 - Q3b OR, 04 marks)
24. **Explain the concept of availability, redundancy, and predictability in the engineering design stage.** (W24 - Q3c OR, 07 marks)
25. **Explain Design synthesis in brief.** (S23 - Q5a, Not specified)
26. **Discuss hypothesis testing in engineering.** (S23 - Q5b, Not specified)
27. **Explain Product Verification process in detail.** (S23 - Q5c, Not specified)
28. **Discuss transition from development to production.** (S23 - Q5a OR, Not specified)
29. **Explain the Concepts of reliability and redundancy for a system.** (S23 - Q5b OR, Not specified)
30. **Explain the concept of system integration.** (S23 - Q5c OR, Not specified)
31. **Give any one example of complex system where system engineering is needed and explain it.** (S24 - Q5a, 03 marks)
32. **Define redundancy in engineering design stage.** (S24 - Q5b, 04 marks)
33. **Explain the Concepts of maintainability, availability, predictability.** (S24 - Q5c, 07 marks)

- marks)
34. **Explain Test planning and preparation in detail.** (S24 - Q5a OR, 03 marks)
 35. **Describe functional analysis - Top down process.** (S24 - Q5b OR, 04 marks)
 36. **Describe Integration, testing and evaluation of Total system in detail.** (S24 - Q5c OR, 07 marks)
 37. **What is design synthesis?** (W22 - Q5a, 03 marks)
 38. **Explain System Maintenance Process in brief.** (W22 - Q5b, 04 marks)
 39. **Explain Integration, Verification and Validation of a system.** (W22 - Q5c, 07 marks)
 40. **What is system integration?** (W22 - Q5a OR, 03 marks)
 41. **Explain System Operation Process in brief.** (W22 - Q5b OR, 04 marks)
 42. **Explain Product Verification process in detail.** (W22 - Q5c OR, 07 marks)
