



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad -500 043

INFORMATION TECHNOLOGY

TUTORIAL QUESTION BANK

Course Name	: SOFTWARE ENGINEERING
Course Code	: ACS008
Class	: IV Semester
Branch	: Information Technology
Year	: 2018 – 2019
Course Faculty	: Ms. B.Dhanalaxmi, Assistant Professor Mr.A.Praveen, Assistant Professor Department of Information Technology

COURSE OVERVIEW:

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

COURSE OBJECTIVES:

The course should enable the students to:

I.	Learn how to elicitate requirements and develop software life cycles.
II.	Understand the design considerations for enterprise integration and deployment.
III.	Analyze quality assurance techniques and testing methodologies.
IV.	Understand implementation issues such as modularity and coding standards.
V.	Prepare a project plan for a software project that includes estimates of size and effort, a schedule, resource allocation, configuration control, and project risk.

COURSE LEARNING OUTCOMES:

Students, who complete the course, will have demonstrated the ability to do the following:

Sl. No.	Descriptio
ACS008.01	Understand the key concerns that are common to all software development processes.
ACS008.02	Identify the appropriate process models, approaches and techniques to manage a given software development process.
ACS008.03	Identify the approach to risks management through risk identification, risk measurement and risk mitigation.
ACS008.04	Use the concept of Earned Value Analysis (EVA) to measure the projects progress at any given point in time, forecasting its completion date and final cost, and analyzing variances in the schedule and budget as the project proceeds.
ACS008.05	Memorize project planning activities that accurately help in selection and initiation of individual projects and of portfolios of projects in the enterprise.
ACS008.06	Identify dependability and security issues that affect a given software product.
ACS008.07	Use the concept of classical analysis to determine the acceptance criteria as part of specification.
ACS008.08	Memorize the importance of eliciting the requirements for a software product and translate these into
ACS008.09	Understand the concept of data dictionary in order to manage the details in large-scale systems, to locate errors and omissions in the system.
ACS008.10	Understand the concept of petri nets that exhibit concurrency, synchronization and used as a visual communication aid to model the system behavior.
ACS008.11	Memorize the design of object oriented software using with the aid of a formal system modeling notation.
ACS008.12	Learn to model the structure and behavior of a software system.
ACS008.13	Memorize different architectural styles, patterns and architectural mapping using data
ACS008.14	Understand the principles of graphical user interface design.
ACS008.15	Understand the concept of component-level design used to define interface characteristics and communication mechanisms for each software component identified in the architectural design.
ACS008.16	Understand the importance of testing with the performance of root cause analysis.
ACS008.17	Memorize the concepts of software testing approaches such as unit testing and integration testing.
ACS008.18	Understand the approaches to verification and validation including static analysis and reviews.
ACS008.19	Identify the major differences between white box testing and black box testing.
ACS008.20	Understand the importance of refactoring which improves the performance of non functional attributes of the software.
ACS008.21	Learn to manage time, processes and resources effectively by prioritizing competing demands to achieve personal and team goals.
ACS008.22	Understand the concept of risk management through risk identification, risk measurement and mitigation.
ACS008.23	Memorize the relationship between people and effort.
ACS008.24	Identify the importance of earned value analysis related to project scheduling.
ACS008.25	Use a proactive, structured risk assessment and analysis activity to identify and analyze root causes.
ACS008.26	Possess the knowledge and skills for employability and to succeed in national and international level competitive exams.

TUTORIAL QUESTION BANK

S. No	QUESTION	Blooms taxonomy level	Course Learning Outcomes
UNIT - I			
SOFTWARE PROCESS AND PROJECT MANAGEMENT			
Part - A (Short Answer Questions)			
1	Demonstrate all the applications of software	Remember	ACS008.01
2	List out the types of software myths?	Remember	ACS008.02
3	List out all the umbrella activities in process framework	Understand	ACS008.02
4	Discuss about software process?	Remember	ACS008.02
5	List out the different layers of software engineering.	Understand	ACS008.02
6	Define the process pattern?	Remember	ACS008.03
7	List out the types of software process models.	Understand	ACS008.03
8	Define various steps involved in identifying a Task Set	Remember	ACS008.03
9	Give the importance of process patterns in designing a module.	Remember	ACS008.05
10	Discuss the template for process patterns.	Remember	ACS008.03
11	Explain waterfall model and who invented waterfall model	Understand	ACS008.02
12	List the three types of process patterns, with suitable examples.	Remember	ACS008.03
13	List different advantages of waterfall model.	Understand	ACS008.02
14	Discuss different disadvantages of waterfall model.	Remember	ACS008.02
15	Illustrate various problems of prototyping.	Remember	ACS008.02
16	Define the use of incremental process model	Understand	ACS008.02
17	List out the disadvantages of spiral model	Understand	ACS008.02
18	Discuss about component based development.	Remember	ACS008.02
19	Define how software cost is estimated.	Understand	ACS008.05
20	What is the use of COCOMO model.	Understand	ACS008.05
21	Discuss about project scheduling?	Understand	ACS008.05
22	Demonstrate the concept of earned value analysis.	Remember	ACS008.04
22	Write about risk management.	Understand	ACS008.05
Part - B (Long Answer Questions)			
1	Explain the evolving role of software.	Remember	ACS008.01
2	Define software and explain the various characteristics of software.	Remember	ACS008.01
3	Explain “Software myth”? Discuss on various types of software myths and the true aspects of these myths.	Remember	ACS008.01
4	Discuss about software Engineering? Explain the layered technology of software engineering.	Understand	ACS008.01
5	Describe with the help of the diagram discuss in detail waterfall model. Give certain reasons for its failure.	Understand	ACS008.02
6	Explain the use of incremental process model with neat diagram.	Understand	ACS008.02

7	Discuss briefly about Evolutionary Process Models with neat diagram.	Remember	ACS008.02
8	Explain briefly about the Spiral model with neat sketch.	Understand	ACS008.02
9	Describe the use of concurrent development model (or) concurrent engineering model.	Understand	ACS008.02
10	Explain briefly about Component- Based Development model.	Understand	ACS008.02
11	Discuss briefly about Aspect-Oriented Software Development model	Remember	ACS008.02
12	What is Estimation? Explain its importance with examples.	Understand	ACS008.05
13	Explain in detail about LOC-based and FP-based estimation with an example.	Understand	ACS008.05
14	Describe COCOMO model and explain its importance.	Understand	ACS008.05
15	What is scheduling? Explain the importance of scheduling in software development.	Remember	ACS008.04
16	Discuss the importance of earned value analysis	Understand	ACS008.04
17	What is risk? Explain about reactive versus proactive risk strategies	Remember	ACS008.03
18	Discuss in detail about different software risks.	Understand	ACS008.03

Part - C (Problem Solving and Critical Thinking Questions)

1	Try to develop a set of actions for the communication activity. Select one action and define a task set for it.	Understand	ACS008.02
2	Is it possible to combine process models? If so, provide an example.	Understand	ACS008.02
3	What are the advantages and disadvantages of developing software in which quality is “good enough”?	Remember	ACS008.02
4	Explain why systems developed as prototypes should not normally be used as production systems.	Understand	ACS008.02

**UNIT - II
REQUIREMENTS ANALYSIS AND SPECIFICATION**

Part – A (Short Answer Questions)

1	Discuss different types of system requirements?	Understand	ACS008.06
2	What are functional requirements?	Understand	ACS008.06
3	Explain nonfunctional requirements?	Understand	ACS008.06
4	Discuss domain requirements?	Remember	ACS008.06
5	List different kinds of nonfunctional requirements?	Remember	ACS008.06
6	Define functional requirement with an example?	Understand	ACS008.07
7	Discuss user requirements in detail?	Understand	ACS008.07
8	Explain the need for system requirement.	Remember	ACS008.07
9	Discuss about requirement validation?	Understand	ACS008.08
10	Explain about requirement engineering process	Remember	ACS008.08
11	Discuss about requirement discovery	Remember	ACS008.08
12	Discuss about Requirements classification and organization.	Understand	ACS008.08
13	Compare functional and non functional requirements.	Remember	ACS008.08
14	Demonstrate the use of Ethnography technique.	Understand	ACS008.08
15	What is Scenarios? Explain.	Remember	ACS008.08
16	Define the characteristics of Effective interviewers.	Understand	ACS008.08
17	Give an example for requirement validation.	Remember	ACS008.08

18	Discuss various types of validation techniques that can be used individually or in conjunction with one another:	Understand	ACS008.08
19	Explain about Requirements management planning	Remember	ACS008.08
20	Discuss about Requirements change management.	Remember	ACS008.08
21	Explain requirement review?	Understand	ACS008.08
22	Define data dictionary?	Understand	ACS008.08
23	Discuss data flow model?	Understand	ACS008.08
24	Explain Data dictionary in the process of requirements analysis, state machine model of a microwave oven?	Remember	ACS008.09
25	List kinds of behavioral and object models?	Understand	ACS008.09
26	Design class hierarchy for library by using inheritance model?	Remember	ACS008.09
27	List different examples for non functional requirements.	Understand	ACS008.09
28	Write about Structured system analysis	Remember	ACS008.09
29	Write about importance of data dictionary in classical analysis.	Understand	ACS008.09
30	Discuss about petri nets?	Understand	ACS008.10
Part - B (Long Answer Questions)			
1	What is requirement? Explain about user requirements with an example.	Understand	ACS008.06
2	Explain briefly about functional requirements with an example.	Remember	ACS008.06
3	Discuss in detail about non-functional requirements with an example.	Remember	ACS008.06
	Compare and contrast functional requirements and non-functional requirements.	Understand	ACS008.06
4	What are system requirements? Explain in a detail.	Understand	ACS008.06
5	Explain briefly about The software requirements document.	Remember	ACS008.06
6	Discuss about requirement engineering process.	Understand	ACS008.07
7	Discuss briefly how requirement validation is done?	Understand	ACS008.07
8	Explain how requirements are managed in software project management.	Understand	ACS008.08
9	Discuss in detail about requirement discovery with an example.	Understand	ACS008.08
10	What is interviewing? Explain different types of interviews.	Remember	ACS008.08
11	Write short notes on requirement specification with an example.	Remember	ACS008.08
12	Define the importance of natural language specification with an example.	Understand	ACS008.08
13	Discuss how requirements are elucidated and validated in software project.	Understand	ACS008.08
14	Demonstrate the uses of Use cases in requirements elicitation and analysis with an example.	Remember	ACS008.08
15	What is Ethnography? Explain its importance.	Understand	ACS008.08
16	Discuss how feasibility studies are important in requirement engineering process.	Remember	ACS008.08
17	Why and how requirements validation is done in software development.	Understand	ACS008.08
18	What do you mean by structured system analysis? Elaborate.	Understand	ACS008.09
19	Discuss in detail the need of petri nets, with an example.	Remember	ACS008.10
20	Define Data dictionary. Give the importance of data dictionary with an suitable example.	Understand	ACS008.09

Part – C (Problem Solving and Critical Thinking)			
1	Identify various functional and non functional requirements that may be defined for library based system.	Remember	ACS008.06
2	List out user requirements for the following functions a) Cash dispensing function in a bank ATM. b) Spelling check and correcting function in a word processor	Understand	ACS008.06
3	Write a set of non-functional requirements for the ticket-issuing system, setting out its expected reliability and response time..	Understand	ACS008.06
4	Discuss the functionality of an ATM machine and develop a set of use cases that could serve as a basis for understanding the requirements for an ATM system.	Understand	ACS008.09
5	Explain who should be involved in requirements review? draw a process model showing how a requirements review might be organized.	Understand	ACS008.10
UNIT-III SOFTWARE DESIGN			
Part – A (Short Answer Questions)			
1	Explain why design is important in software engineering	Remember	ACS008.11
2	Discuss analysis and design model	Understand	ACS008.11
3	Describe about software quality guidelines	Understand	ACS008.11
4	How do we assess the quality of a software design	Remember	ACS008.11
5	What characteristics are common to all design methods?	Understand	ACS008.11
6	Write a short note on Abstraction.	Understand	ACS008.11
7	Discuss the importance of design pattern	Remember	ACS008.11
8	Explain about the modularity in design concepts.	Understand	ACS008.11
9	Discuss the concept of Information Hiding and Functional Independence.	Remember	ACS008.11
10	Discuss the importance of refactoring in software design.	Understand	ACS008.12
11	Write a short note on design classes in software design.	Understand	ACS008.12
12	Discuss about interface design elements in the design model	Remember	ACS008.12
13	Write short notes on component level and deployment level design elements	Remember	ACS008.12
14	Define software architecture with its importance	Understand	ACS008.13
15	Write short notes on architectural descriptions	Remember	ACS008.13
16	Explain taxonomy of architectural styles	Understand	ACS008.13
17	Write a short notes on architecture patterns	Remember	ACS008.13
18	Demonstrate about representing the system in context	Understand	ACS008.13
19	Define the roles of archetypes in architectural design	Remember	ACS008.13
20	Write short notes on architectural mapping using data flow	Understand	ACS008.13
21	What is user interface design	Understand	ACS008.14
22	Demonstrate the importance of user analysis	Remember	ACS008.14
23	Discuss about Use cases and Task elaboration	Remember	ACS008.14

24	Write short notes on Workflow analysis	Understand	ACS008.14
25	Define various User interface design steps	Understand	ACS008.14
26	Write any three user interface design issues	Remember	ACS008.14
27	List out the golden rules for interface design	Understand	ACS008.14
28	What is a component?	Understand	ACS008.15
29	What belongs to a component according to object oriented view	Remember	ACS008.15
30	List any two basic design principles that are applicable to component-level design	Understand	ACS008.15
31	What should we consider when we name components?	Remember	ACS008.15
32	Write a short notes on cohesion	Remember	ACS008.15
33	What is coupling? Explain different categories of coupling	Understand	ACS008.15
34	List out the steps for conducting component level design	Remember	ACS008.15
35	Discuss the importance of graphical design notation in designing class based components	Understand	ACS008.15
36	List the various steps to develop a decision table.	Understand	ACS008.15
37	What is program design language? Discuss in detail.	Remember	ACS008.15
38	Why are control components necessary in traditional software and generally not required in object-oriented software?	Remember	ACS008.15
Part – B (Long Answer Questions)			
1	Explain briefly about the design process and also explain its characteristics.	Understand	ACS008.11
2	Discuss briefly the following fundamental concepts of software design: i) Abstraction ii) Modularity iii) Information hiding.	Remember	ACS008.11
3	Illustrate the importance of design classes. Explain different types design classes.	Remember	ACS008.11
4	Discuss in detail about architectural design elements and interface design elements.	Understand	ACS008.11
5	Explain the importance of component level design and deployment level design elements.	Understand	ACS008.11
6	What is software architecture? Why it is important explain with an example.	Understand	ACS008.12
7	Explain briefly about transform mapping with an example	Understand	ACS008.12
8	Demonstrate the importance of Archetypes with an example.	Remember	ACS008.12
9	Discuss in detail about different architectural styles.	Remember	ACS008.13
10	Demonstrate how a system represent in architectural context with an example.	Remember	ACS008.13
11	Discuss briefly about the golden rules for the user interface design.	Understand	ACS008.14
12	Explain briefly about the importance of task analysis and modeling.	Remember	ACS008.14
13	Discuss in detail about user interface design patterns with an example.	Remember	ACS008.14
14	Explain briefly about different common design issues in user interface design.	Understand	ACS008.14
15	List the basic design principles for designing class based components.	Remember	ACS008.15
16	What is Cohesion? Explain its importance in designing class based components.	Understand	ACS008.15
17	Discuss in detail about Coupling and also explain different categories of Coupling.	Remember	ACS008.15

18	Compare and contrast Coupling and Cohesion in designing class based components.	Understand	ACS008.12
19	Describe about graphical design notation in designing traditional components.	Remember	ACS008.15
20	Explain the necessary steps to build decision table in designing traditional components.	Understand	ACS008.15
Part – C (Problem Solving and Critical Thinking)			
1	State how do we assess quality of a software design?	Understand	ACS008.11
2	Describe the design pattern that you encounter in a category of everyday things.	Understand	ACS008.12
3	Explain the examples of three data abstractions and the procedural abstractions that can be used to manipulate them.	Understand	ACS008.13
4	Demonstrate the architecture of a house or building as a metaphor, Draw comparison with software architecture. How are the disciplines of classical architecture and software architecture similar? How do they differ?	Understand	ACS008.15
UNIT-IV TESTING AND IMPLEMENTATION			
1	What are the characteristics of testability?	Understand	ACS008.16
2	Define various test characteristics.	Remember	ACS008.16
3	Write short notes on internal and external views of testing.	Understand	ACS008.16
4	What is white box testing?	Understand	ACS008.16
5	Discuss the importance of graph matrices in basis path testing.	Remember	ACS008.16
6	Explain different steps that can be applied to derive the test cases.	Understand	ACS008.16
7	What is loop testing? Write a short notes on loop testing.	Understand	ACS008.16
8	Define condition testing and data flow testing.	Remember	ACS008.16
9	What are the differences between verification and validation?	Understand	ACS008.18
10	Demonstrate about boundary value analysis in black box testing.	Remember	ACS008.19
11	Discuss in detail about graph-based testing methods.	Remember	ACS008.19
12	What is regression testing?	Understand	ACS008.19
13	Write short notes on unit testing and explain its environment.	Understand	ACS008.17
14	What is the use of integration testing? Explain its types.	Remember	ACS008.17
15	Discuss about alpha and beta testing.	Understand	ACS008.18
16	Define stress and performance testing.	Understand	ACS008.18
17	Explain about debugging process.	Remember	ACS008.18
18	Define various debugging strategies.	Remember	ACS008.18
19	Define the importance of refactoring technique in software implementation.	Understand	ACS008.20
20	Write short notes on coding practices.	Understand	ACS008.20
Part – B (Long Answer Questions)			
1	Explain about the importance of test strategies for conventional software.	Understand	ACS008.17
2	What is testing? Discuss in detail about Black-Box testing.	Remember	ACS008.19
3	Compare and contrast black box testing and White Box testing.	Understand	ACS008.19

4	Discuss in detail about basis path testing and explain its importance.	Remember	ACS008.16
5	Explain briefly about control structure testing.	Understand	ACS008.16
6	What is system testing? Explain briefly about system testing.	Understand	ACS008.19
7	Discuss in detail about the art of debugging.	Remember	ACS008.19
8	Demonstrate the importance of validation testing?	Understand	ACS008.18
9	Write short notes on regression and white box testing.	Remember	ACS008.19
10	Explain about various software implementation techniques.	Understand	ACS008.20

Part – C (Problem Solving and Critical Thinking)

1	Who should perform the validation test—the software developer or the software user? Justify your answer.	Understand	ACS008.16
2	Develop a complete test strategy for the SafeHome system.	Understand	ACS008.16
3	Using your own words, describe the difference between verification and validation.	Remember	ACS008.18
4	Is unit testing possible or even desirable in all circumstances? Provide examples to justify your answer.	Remember	ACS008.18

**UNIT-V
PROJECT MANAGEMENT**

Part - A (Short Answer Questions)

1	Write short notes on estimation.	Understand	ACS008.21
2	Give an example of LOC-based cost estimation	Remember	ACS008.21
3	Write a short notes on FP-based cost estimation	Remember	ACS008.21
4	Discuss about outsourcing.	Remember	ACS008.21
5	What is planning? Write about project planning process.	Understand	ACS008.21
6	Write a short note on COCOMO II model.	Remember	ACS008.21
7	Discuss about proactive risk strategies.	Understand	ACS008.22
8	Demonstrate various types of software risks.	Understand	ACS008.22
9	Write a short note on risk identification.	Remember	ACS008.22
10	Explain how overall project risk will be assessed.	Understand	ACS008.22
11	What is risk projection (or) risk estimation?	Remember	ACS008.22
12	Elaborate the RMMM.	Remember	ACS008.22
13	Discuss about software project scheduling.	Understand	ACS008.24
14	What are the basic principles of software project scheduling?	Remember	ACS008.24
15	Define the relationship between people and effort.	Remember	ACS008.23
16	How should effort be distributed across the software process workflow?	Understand	ACS008.23
17	Discuss about time-line charts with an examples.	Understand	ACS008.24
18	Write a short note on earned value analysis.	Understand	ACS008.24
19	Determine process metrics and software process improvement	Remember	ACS008.25
20	Illustrate the various metrics for software quality.	Understand	ACS008.24

Part - B (Long Answer Questions)

1	Explain in detail about Reactive versus Proactive Risk Strategies	Understand	ACS008.22
2	Write briefly about Risk mitigation, monitoring, and management.	Remember	ACS008.22

3	What is scheduling? Explain the importance of scheduling in the project management.	Remember	ACS008.24
4	Discuss the importance of project scheduling.	Understand	ACS008.24
5	Write about how to define a task set for the software project.	Remember	ACS008.24
6	How the risk identification is done in risk management.	Remember	ACS008.22
7	Compare the pros and cons of COCOMO and COCOMO II Models?	Understand	ACS008.23
8	Explain in detail about software measurement and discuss various metrics.	Remember	ACS008.21
9	Explain the process of integrating metrics within the software process.	Remember	ACS008.21
10	Discuss in detail about various metrics for small organizations.	Understand	ACS008.21
Part – C (Problem Solving and Critical Thinking)			
1	Describe the difference between “known risks” and “predictable risks.”	Understand	ACS008.22
2	Describe five software application areas in which software safety and hazard analysis would be a major concern.	Understand	ACS008.22

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