INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

INFORMATION TECHNOLOGY

TUTORIAL QUESTION BANK

Course Title	**SOFTWARE TESTING METHODOLOGIES**			
Course Code	**A60525**			
Regulation	R15			
Course Structure	Lectures	Tutorials	Practical's	Credits
	4	-	-	4
Team of Instructors	Mrs B Pravallika, Assistant Professor, IT			

OBJECTIVES:

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.

GROUP - A (SHORT ANSWER QUESTIONS)			
S. No.	**Question**	**Blooms Taxonomy Level**	**Course Outcome**
	UNIT – I		
1.	Explain goals for testing and model for testing in software testing?	Understand	1
2.	Describe phases in tester's mental life and state Complexity Barrier?	Remember	1
3.	Explain about test design and explain different types of testing?	Understand	1
4.	Explain the following a) Environment b) Program c) Bugs	Understand	1
5.	State pesticide paradox and complexity barrier in purpose of testing?	Remember	2
6.	Demonstrate nightmare list and when to stop testing in the consequences of bugs?	Understand	2
7.	Illustrate hardware architecture and software architecture?	Understand	2
8.	Differentiate function versus structure testing .and compare small versus large programming?	Understand	2
9.	Demonstrate test bug remedies and illustrate requirement bugs?	Understand	2
10.	Explain external interfaces and internal interfaces and discuss the consequences of bugs?	Understand	2
11.	Define path testing and explain about decision and case statements?	Remember	5
12.	Explain bug assumption and compare control flow graphs and flow charts?	Understand	5

13.	State control flow graph and list independence and co-relation of variables and predicates?	Remember	5
14.	State process blocks and defines predicate and path predicates?	Remember	5
15.	Demonstrate path statement, path testing criteria and explain branch testing?	Understand	5
16.	Explain about simple independent and co-related predicates?	Understand	5
17.	Define loops and explain different types of loops and **Explain** nested loops	Understand	5
18.	Explain flow graph notational evolution and explain co-related independent predicates?	Understand	5
19.	Explain path nodes and links and explain the effectiveness and limitations of path testing?	Understand	5
20.	Explain multi entry and multi exit routines and describe path predicate expression?	Understand	5

GROUP-B (LONG ANSWER QUESTIONS)

S. No.	Question	Blooms Taxonomy Level	Course Outcome
	UNIT - I		
1	Discuss that software testing will ensure the quality of a developed software?	Understand	1
2	Describe is it possible for a tester to find all the bugs in a system Why might it not be necessary for a program to be completely free of defects before it is delivered to its customers? And Discuss to what extent can testing be used to validate that the program is fit for its purpose?	Understand	1
3	Demonstrate the phases in a tester's mental life and Define testing and explain the purpose of testing?	Understand	1
4	Explain the principles of test case design? And List out various dichotomies and explain?	Understand	2
5	State differences between functional and structural testing? and List the factors on which the importance of the bugs depends and give the metrics for them?	Understand	2
6	Classify the different kinds of bugs and explain? And Explain the procedure used in quantifying the nightmare list to stop Testing?	Understand	4
7	Discuss clearly about requirements, features, and functionality of bugs? and Discuss control and sequence bugs and the methods to be caught?	Understand	4
8	Summarize white box testing and black box testing and give the differences between them? And Compare static data and dynamic data?	Understand	4
9	Discuss interface, integration and system bugs with an example? And Explain about resource management problem in software testing?	Understand	4
10	Demonstrate structural bugs, coding bugs, data bugs and system bugs and discuss methods to catch these bugs? And Discuss the classes of bugs in the taxonomy of bugs?	Understand	4
11	Define software bug in software testing? And Discuss pesticide paradox and complexity barrier?	Understand	4
12	Define integration testing and discuss the goals of integration testing? And Explain clearly the white box tests and behavioural tests?	Understand	4
13	Define statement coverage (C1) and branch coverage (C2)? Explain with an example methods to select enough paths to achieve C1+C2?	Understand	5
14	Discuss about assignment blindness, and equality blindness of predicates?Explain the terms achievable and unachievable paths?	Understand	5
15	Discuss about "Traversal marker" form of path instrumentation?Explain coincidental correctness? Give an example?	Understand	5
16	Discuss statement testing and branch testing? Give suitable examples?State and explain various path selection rules for path testing?	Understand	5

17	Explain about program's control flow? Is it useful for path testing?Discuss various flow graph elements with their notations?	Understand	5
18	**J**ustify flowchart is different from a control flow graph?Explain about multi entry and multi exit routines and fundamental path selection criteria?	Understand	5
19	Describe the following concepts a. Predicates b. Predicate Expression c. Predicate Coverage d. Achievable paths	Understand	5
20	Define path sensitization and write heuristic the procedure used in path sensitization?Explain how concatenated loops can be tested?Discuss the three cases for single loop testing?	Understand	5
21	Write about implementation of path testing and various applications of path testing ? Explain the linear predicates with the help of an example?Draw a flow graph for calculating the sum of n given numbers algorithm?	Understand	5
22	Explain the following terms i. New code ii. Maintenance iii. Re-hosting	Understand	5
23	Define predicates? Explain multi-way branches and inputs used in path testing?Discuss predicate interpretation? Explain independence and co-relation of variables and predicates?	Understand	5
24	Explain the following terms i. Independent and un co-related predicates ii. Co-related independent predicates iii. Dependent predicates	Understand	5
GROUP-III (ANALYTICAL QUESTIONS			
S. No.	**Question**	**Blooms Taxonomy Level**	**Course Outcome**
UNIT – I			
1	Discuss in practice, that life cycle model may have more, fewer or different levels of development and testing, depending on the project and the software product?	Understand	3
2	Demonstrate when the build comes to the QA team, the parameters to be taken for consideration to reject the build upfront without committing for testing?	Understand	2
3	Discuss that test cannot be automated? Acceptance test plan is prepared from? Explain the test case design methodology? Does test plan contain bug tracing procedure and reporting procedure?	Understand	4
4	Discuss the importance of a document for product? How will you test requirement and design document?	Understand	3
5	Identify yourself as a developer of flight control system? Describe any three test adequacy criteria you would consider applying to develop test cases for flight control system?	Understand	1
6	List and explain types of system test? Why is testing plan important for developing a repeatable and managed testing process? Give example.	Understand	1
7	Defin**e** role do user/client play in the development of test plan for a project? Should they be present at any of the test plan reviews? Justify.	Understand	2
8	Discuss developing a patient record system for health care centre, why one of the stop test will be most appropriate for this system? What is the role of the tester in supporting, monitoring and controlling of testing?	Understand	2
9	Demonstrate why is it important to meticulously inspect test result? Give Example? Discuss the drawbacks in case if you fail to inspect?	Understand	1

10	Enumerate why is it impossible for a tester to find all the bugs in a system? Why might it not be necessary for a program to be completely free of defects before it is delivered to its customers?	Understand	2
11	Consider the following fragment of code. **Explain** how many tests are required for 100% decision coverage? if width > length then biggest dimension = width if height > width then biggest dimension = height end_if else biggest dimension = length if height > length then biggest dimension = height end_if end_if	Understand	5
12	Design test cases to provide 100% statement and 100% decision coverage for the following fragment of code. if width > length then biggest dimension = width else biggest dimension = length end_if The following has been added to the bottom of the code fragment above. Print "Biggest dimension is" & biggest dimension print "Width: "& width print "Length: " & length. How many more test cases are required?	Remember	5
13	Given the following code, Demonstrate which statement is true about the minimum number of test cases required for full statement and branch coverage? Read p Read q IF p+q > 100 THEN Print "Large" ENDIF IF p > 50 THEN Print "p Large" ENDIF	Understand	5
14	Describe the activities or tasks and responsibilities for developer or tester in support of multilevel testing?	Understand	5
15	List the tasks that must be performed by the developer or tester during the preparation for unit testing?	Understand	5
16	Illustrate the importance of security testing and what are the consequences of security breaches, also write the various areas which has to be focused on during security testing and State the need for integration testing in procedural code?	Understand	5

17	For the code fragment given below, Demonstrate which answer correctly represents minimum tests required for statement and branch coverage respectively
	Discount rate=1;
	Fare = 1000;
	If ((person == "senior citizen") and ("travel month = January"))
	Bonuspoints = 100+Bonuspoints;
	If (class=="first")
	discountRate = .5;
	Fare = fare * discountRate;
		Understand	5

18	Consider pseudo code below were a programming language **Find** the no of tests are required to achieve 100% statement coverage?
	If x=3 then
	Display_messageX;
	If y=2 then
	Display_messageY;
	Else
	Display_messageZ;
	Else
	Display_messageZ;
		Understand	5

19	Given the following code, Discuss the minimum number of test cases required for full statement and branch coverage?
	Read p
	Read q
	IF p+q > 100 THEN
	Print "Large"
	ENDIF
	IF p > 50 THEN
	Print "p Large"
	ENDIF
		Understand	5

20	Define which combination of p, q and r values will ensure 100 % statement coverage?
	if (p = q) {
	r = r + 1;
	if (r < 5) {
	s = 10;
	}
	} else if (p > q) {
	s = 5;
	}
		Understand	5

GROUP - A (SHORT ANSWER QUESTIONS)

UNIT – II

S. No.	Question	Blooms Taxonomy Level	Course Outcome
1.	Explain all c-uses/some p-uses strategies and discuss all p-uses/some c-uses strategies?	Understand	6
2.	Explain births and mergers in a transaction flow testing?	Understand	6
3.	Demonstrate transaction flow structure and discuss transaction flow testing techniques?	Understand	6
4.	Demonstrate du-path and define all du-paths?	Understand	6
5.	Define path selection and illustrate path sensitization?	Understand	6
6.	Describe all predicate uses and all computational uses strategy?	Understand	6
7.	Explain transaction flow sensitization and discuss transaction instrumentation?	Understand	6
8.	Demonstrate data flow anomalies and explain components of data flow model?	Understand	6
9.	Define data flow testing and explain the application tools and effectiveness of data flow testing?	Understand	6
10.	Explain how Transaction Flow occurs?	Understand	6
11.	Explain applications of transaction flows?	Understand	6
12.	Demonstrate how to implement Transaction Flows with example?	Understand	6
13.	Describe different complications in Transaction Flows?	Understand	6
14.	Define Data Flow Testing?	Remember	6

15.	Define MIMD Machines?	Remember	6
16.	Explain Data Flow Anomalies?	Understand	6
17.	Explain Data Flow Anomaly State Graph with example?	Understand	6
18.	Compare static versus dynamic anomaly detection?	Understand	6
19.	Compare Transaction Flow graph and Data Flow graph?	Understand	6

GROUP-B (LONG ANSWER QUESTIONS)

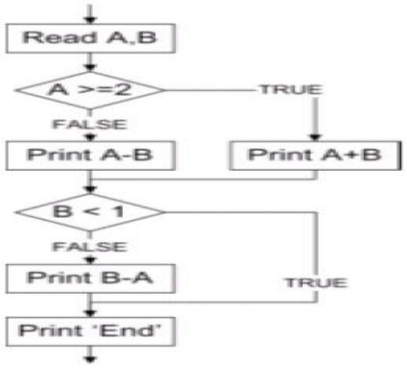
UNIT – II

S. No.	Question	Blooms Taxonomy Level	Course Outcome
1	Demonstrate an anomaly can be detected. Explain different types of data flow anomalies and data flow anomaly state graphs? And Write applications of data flow testing?	Understand	7
2	Demonstrate the transaction flows? Discuss their complications? And Discuss about static and dynamic anomaly detection?	Understand	6
3	State and explain various transaction flow junctions and mergers? And Explain the terms inspections, reviews and walkthroughs?	Understand	6
4	Discuss the following strategies of data flow testing with suitable examples: i. All-predicate-uses (APU) strategy ii. All-computational (ACU) strategy	Understand	7
5	Define program slice? Discuss about static and dynamic program slicing? Explain the terms Dicing, Data-flow and Debugging?	Remember	7
6	Demonstrate transaction flows occurrence , illustrate with help of Examples. implementation of a transaction flow is usually implicit in The design of the systems control structure and database explain?	Understand	6
7	Explain the transaction flow testing with an example Distinguish between control flow and transaction flow?	Understand	6
8	Define transaction flow structure? Discuss the reasons that the Transaction flows are often structured?	Remember	7
9	Define the terms i. Biosis ii. Mitosis iii. Absorption iv. Conjugation	Remember	6
10	List nine possible two-letter combinations of the object states of data Anomalies. Classify them as buggy, suspicious and ok?	Understand	7
11	Discuss All-du-Paths (ADUP) is the strongest data-flow testing Strategy?	Remember	7
12	Define the terms i. Definition clear path segment ii. Loop free path segment iii. Simple path segment	Understand	7
13	Construct the Dataflow graph for the following problem. i. Given L, t, and d, solve for Z. ii. cos(C) = cos(L) sin(t) iii. tan(M)= cot(L) cos(t) iv. tan(Z+F)= -sin(L) tant(t) v. tan (F) = cos(M) tan(M+d).	Understand	7
14	Name and explain data flow testing strategies? Discuss the reasons why only the static anomaly detection is not enough?	Remember	7
15	Discuss the three possible interpretations of the decision symbol with two or more out links?	Remember	7
16	Define a transaction explain steps involved in an online transaction system.	Understand	7

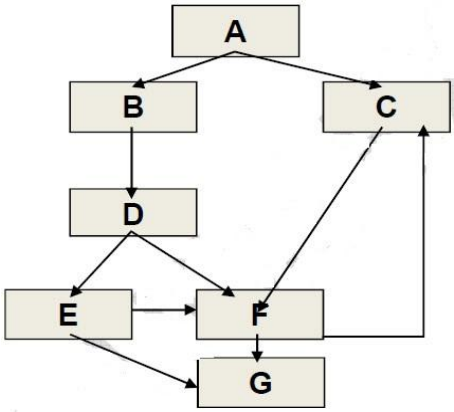
17	List out the applications of transaction flows and Discuss the implementation of transaction flow	Remember	7
18	Explain transaction flow strategies. List out the advantages and disadvantages of path selection in transaction flow?	Understand	7
19	Explain the methodologies applied for testing blindness? And Explain the classification and detection of Anomaly?	Understand	7
GROUP-III (ANALYTICAL QUESTIONS)			
UNIT – II			
S. No.	**Question**	**Blooms Taxonomy Level**	**Course Outcome**
2	Discuss during an early period of test execution, a defect is located, resolved and conformed as resolved re-testing ,but is seen again later during subsequent test execution .what type of testing can be conducted for a related aspect of configuration management that is most likely to have broken down?	Understand	6
3	If a Product risk analysis is performed during the planning stage of the test process. During the execution stage of the test process, the test manager directs the testers to classify each detect report by the known product risk it relates to other. once a week test manager runs a report that shows the percentage of defects related to each known product risk and to unknown risks. Discuss what is one possible use of such a report?	Understand	6
4	Demonstrate the two specification based techniques are most closely related to each other? Write some key characteristics of specification based techniques?	Understand	7
5	Discuss the most important difference between the metrics based approach and the expert –based approach to test estimation?	Understand	7

6	For the following piece of code Demonstrate how many test cases are needed to get 100% statement coverage?
	
	Procedure X
	Read (Color) // Input color from user
	IF (Color == RED•) THEN
	Call Roses(Color)
	ELSEIF (Color == BLUE•) THEN
	Call Violets(Color)
	ELSE
	PRINT User is no Shakespeare
	SaveToDatabase(Color)
	End Procedure X
		Understand	5

7	For the following piece of code, Demonstrate how many test cases are needed to get 100% statement coverage?
	
	Procedure X
	Read (Color) // Input color from user
	IF (Color == “Red”) THEN
	Call Roses(Color)
	ELSEIF (Color == “Blue”) THEN
	Call Violets(Color)
	ELSE
	PRINT “User is no Shakespeare”
	SaveToDatabase(Color)
	End Procedure X
		Understand	5

8	Consider the following flow chart diagram:  Demonstrate the minimum number of test cases required for 100% statement coverage and 100%decision coverage, respectively?	Understand	5

9	Consider the following sample of pseudo code:
	
	Read A, B, C;
	If A > B then
	Print "Primary ratio is" & A / B;
	End If
	If A > C then
	Print "Secondary ration is" & A / C;
	End If.
	
	List which of the following test cases would achieve 100% statement coverage
		Remember	5

10	Discuss one of the test goals for the project is to have 100% decision coverage. The following three tests have been executed for the control flow graph shown below? Test A covers path: A, B, D, E, G. Test B covers path: A, B, D, E, F, G. Test C covers path: A, C, F, C, F, C, F, G.  	Understand	5

11	Consider the following sample of pseudo code:
	
	Input ExamScore
	If ExamScore <= 75 then
	Print "Candidate has failed"
	Else
	Print "Candidate has passed"
	If ExamScore >= 120 then
	Print "Candidate has achieved a distinction"
	EndIf
	EndIf.
	
	List the minimum number of test cases required to guarantee 100% decision coverage?
		Remember	5

12	If the system requires 100% decision coverage at component testing for all modules. The following module has been tested with a single test case. The test case follows the path A, B, D, E, F, and G. Demonstrate What level of decision coverage has been achieved?	Understand	5

GROUP - A (SHORT ANSWER QUESTIONS)

UNIT – III

MID-I

S. No.	Question	Blooms Taxonomy Level	Course Outcome
1.	Explain domain closure and define domain dimensionality?	Understand	8
2.	Discuss liberalizing transformation and co-ordinate transformation?	Understand	8
3.	Explain about a) Interior Point b) Boundary Point c) Extreme Point d) on-point e) off-point	Understand	8
4.	Describe co-incidental correctness and discuss representative outcome?	Understand	8
5.	Demonstrate complete and systematic boundaries and describe non-linear boundaries?	Understand	8
6.	Explain simple domain boundaries and compound predicates?	Understand	8
7.	State functional homogeneity of bugs and define random testing?	Remember	8
8.	Demonstrate linear vector space and illustrate one-dimensional domain bugs closed boundaries?	Understand	8

MID-II

9.	Explain loop free software and explain interface range/domain compatibility testing?	Understand	8
10.	Explain bug assumptions for Domain Testing?	Understand	8
11.	Compare simple domain boundaries and compound predicates?	Understand	8
12.	Explain linear vector space?	Understand	8
13.	Define Nice domains.	Remember	10
14.	Explain different properties under nice domains?	Understand	8
15.	What are ugly domains?	Understand	8
16.	Compare specified domains and implemented domains.	Understand	8
17.	Explain interior point, boundary point and extreme point?	Understand	8
18.	Define tilted boundary and shifted boundary.	Remember	10
19.	Compare equality predicates and inequality predicates.	Understand	8

GROUP-B (LONG ANSWER QUESTIONS)			
Unit - III			
MID-I			
S. No.	**Question**	**Blooms Taxonomy Level**	**Course Outcome**
1	Demonstrate meaning of domain testing? Discuss various Applications of domain Testing	Understand	8
2	Discuss about equality and inequality predicates. Also explain how They are treated in domain testing?	Understand	8
3	Explain the domain boundary bugs for two dimensional domains? And Discuss about systematic boundaries?	Understand	8
4	Classify what can go wrong with boundaries, then define a test Strategy for each case in domain testing?	Understand	9
5	Discuss about Linear, Non orthogonal, Tilted domain boundaries With suitable examples? and Discuss about ugly domains with suitable examples?	Understand	8
6	Define the following concepts. i. Domains ii. Domain closure iii. Domain dimensionality iv. Bug Assumptions for domain Testing	Remember	8
7	Explain that domain testing can be used in both functional and Structural testing?	Understand	8
8	Discuss about specified and implemented domains? and Discuss about domain closure and domain dimensionality?	Understand	8
9	Describe short notes on i. Ambiguities and contradictions ii. Simplifying the topology iii. Rectifying boundary closures	Understand	8
10	Explain the terms i. Domains and range ii. Closure compatibility iii. Domain compatibility testing	Understand	8
MID-II			
11	Discuss that programmers and testers treat ugly domains? And Explain the restrictions that are made on the domains?	Understand	8
12	Explain the following terms i. Domain Testing ii. Linear zing Transformation iii. Non-Linear zing Transformation iv. Canonical program form	Understand	8
13	Discuss in detail the nice domains and ugly domains with suitable Examples? And Discuss about random testing?	Understand	8
14	Discuss about variations, tools and effectiveness of domain testing?	Understand	8
15	Define domain and explain domain model in detail? And Discuss the simplifications of ugly domains.	Understand	8
16	Explain the testing strategy for two-dimensional domains? And Discuss the purpose of domain testing?	Understand	8
17	List the restrictions of domain testing and explain? And Explain about coordinate transformation?	Understand	8
18	Define the bug assumptions for domain testing. And Explain about simple domain boundaries and compound predicates?	Understand	8
19	List out and explain the properties of domain boundaries and Explain about linearizing transformation	Understand	8

GROUP-III (ANALYTICAL QUESTIONS)			
MID-I			
UNIT - III			
S. No.	**Question**	**Blooms Taxonomy Level**	**Course Outcome**
2	Discuss that would like to know whether black box testing techniques like boundary value analysis and equivalence partitioning during which phases of testing are they used, if possible with examples ?	Understand	8
3	Describe why is it necessary to develop test cases for both valid and invalid input condition?	Remember	8
4	Describe why it is necessary to develop test cases for both valid and invalid input condition. how important is document for product? how will you test requirement and design Document?	Remember	8
5	Consider programmer A and programmer B are working on a group of interfacing modules. Programmer A tends to be a poor communicator and does not get along well with Programmer B. Due to this situation, Discuss what types of defects are likely to surface in these interfacing modules?	Understand	9
6	A program validates a numeric field as follows: values less than 10 are rejected, values between 10 and 21 are accepted, values greater than or equal to 22 are rejected. Define which of the following covers the most boundary values?	Remember	9
MID-II			
7	Discuss In a system designed to work out the tax to be paid: An employee has $4000 of salary tax free. The next $1500 is taxed at 10% The next $28000 is taxed at 22%. Any further amount is taxed at 40% To the nearest $ which of these is a valid boundary value analysis test case?	Understand	9
8	Descuss the digital "Rainbow Thermometer" uses 7 colors to show the ambient temperature. Each color spans a range of just 5 Deg. C, with an operating minimum and maximum of minus 5 Deg. C and 30 Deg.C. Which of the following values is least likely to have been identified when applying the boundary value test design technique?	Understand	9

9	Given the following sample of pseudo code?
	Roman"'>
	Input number of male rabbits
	Input number of female rabbits
	If male rabbits > 0 and female rabbits > 0 then
	Input Do you want to breed (Yes / No)
	If breed = "No"
	Print "Keep male and female rabbits apart!"
	End if
	End If.
	Describe which of the following test cases will ensure that statement "06" is executed?
		Remember	9

10	Consider Arrive and Go airline wants to clarify its baggage handling policy, whilst maximizing revenues, and will introduce the following tariffs for all baggage per individual customer (weights are rounded up to the nearest 0.1Kg): The first 2Kg will be carried free of charge. The next 10 Kg will be carried for a flat charge of $10. An additional 15Kg will be charged a total charge of $17. Luggage over this amount will be charged at $5 per Kg, up to a maximum of 150Kg per person. No passenger may take more that 150Kg with them. Define Which of the following would constitute boundary values for baggage weights in the price calculation?	Remember	9

11	For a system designed to work out the tax to be paid. An employee has $4000 of salary tax free. The next $1500 is taxed at 10%. The next $28000 is taxed at 22% .Any further amount is taxed at 40% .To the nearest $ .Discuss which of these is a valid boundary value analysis test case?	Understand	9
12	If the order numbers on a stock control system can range between 10000 and 99999 inclusive. Describe the following inputs might be a result of designing tests for only valid equivalence classes and valid boundaries?	Remember	9

GROUP - A (SHORT ANSWER QUESTIONS)

UNIT – IV

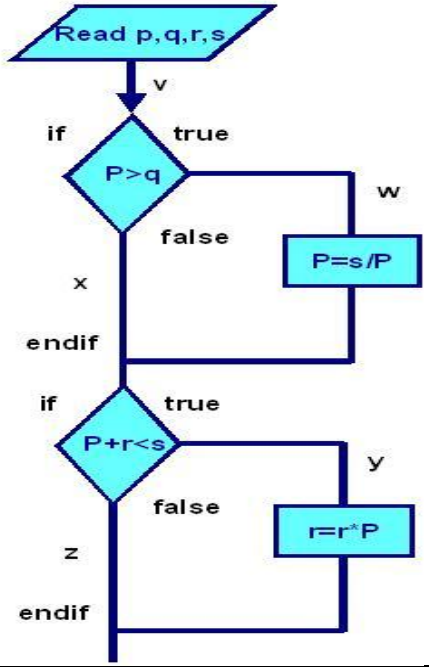
S. No.	Question	Blooms Taxonomy Level	Course Outcome
1.	Explain path sum and discuss approximate minimum number of paths?	Understand	10
2.	Explain the methods of regular expressions and flow anomaly detection?	Understand	10
3.	Demonstrate absorption law and explain the limitations of path testing?	Remember	10
4.	Define loops and explain different loop terms?	Remember	10
5.	Explain identity elements and explain mean processing time of a routine?	Understand	10
6.	Discuss about cross-term step and explain maximum path count arithmetic?	Understand	10
7.	Explain parallel terms and demonstrate how many paths in a flow graph?	Understand	10
8.	Discuss loop terms and demonstrate lower path count arithmetic?	Understand	10
9.	Explain applications of path testing and explain push/pop and get/return?	Understand	10
10.	Define hardware logic testing and explain KV-charts?	Remember	12
11.	Explain about knowledge based systems in logic based testing?	Understand	12
12.	Define decision table and explain about don't care and impossible terms?	Remember	12
13.	Compare condition stub and action stub and discuss three successive stages of canonical processors?	Understand	12
14.	Explain decision table processors and discuss finding and translating the logic?	Understand	12
15.	Explain test case design and sketch KV-charts of 3 variables and 4 variables?	Understand	12
16.	Discuss predicates and relational operators in logic based testing?	Understand	12
17.	Define case tables and multi valued logics in knowledge based systems?	Remember	12
18.	Explain the rules of Boolean algebra and explain them in detail?	Understand	12
19.	Define the operators of Boolean algebra and list them with examples?	Remember	12

GROUP-B (LONG ANSWER QUESTIONS)

UNIT – IV

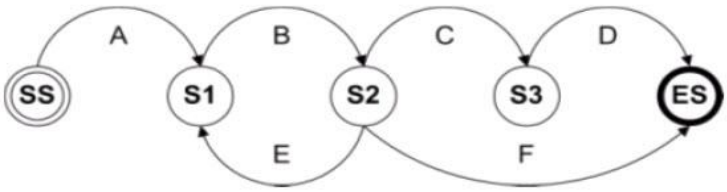
S. No.	Question	Blooms Taxonomy Level	Course Outcome
1	Demonstrate using reduction procedure to convert flow graph whose links are labelled into a path expression? explain each step With flow graph?	Apply	11
2	In reduction procedure explain about: i. Cross-Term step ii. Parallel Term iii. Loop Term iv. Comments, Identities and Node - Removal Order	Understand	10
3	Define path product, path expression and path sum? Explain with an example? And Explain applications of paths, path products and regular expressions?	Remember	10
4	Write short notes on: i. Distributive laws ii. Absorption Rule iii. Loops iv. Identity Elements	Remember	11

5	Demonstrate how to find approximate minimum numbers of paths With an example? And Explain the probability of getting path expression with an example?	Remember	10
6	Discuss regular expressions and flow anomaly detection? And Explain a regular expression and flow anomaly detection method With an example and limitations?	Understand	11
7	Explain about the mean processing time of a routine with an example? and Explain the generalizations and limitations of regular expressions?	Understand	11
8	Explain the push/pop arithmetic with an example? an Explain the get/return arithmetic with an example?	Understand	11
9	Explain the problem occurred in the regular expressions with an Example? Explain the method that will be useful for regular expressions with an Example?	Understand	11
10	Demonstrate decision table and how is a decision table useful in Testing? Explain with the help of an example? Explain prime implicant, sum-of-product form and product-of-sum Form?	Understand	12
11	Explain about don't care conditions in the logic based testing? And Discuss about the ambiguities and contradictions in the Specifications?	Understand	12
12	Demonstrate methods to check the consistency and completeness in The decision tables?	Understand	13
13	Explain the following in logic based systems i. Path and domain ii. Test case design iii. Boolean equations	Understand	12
14	Demonstrate by means of truth tables the validity of the following theorems of Boolean algebra: i. Associative laws ii. Demorgans theorems for three variables iii. Distributive law of + over	Understand	13
15	Demonstrate boolean algebra rules. illustrate the rules with path Expressions.and Use a Karnaugh map to minimize F= B'C'D'+A'B'C'D'+ABC'D+A'BCD+ABD+B'CD'+A'BC'D	Understand	13
16	Demonstrate reduction the following functions using karnaugh map method $F(A,B,C,D)=\pi (4,5,6,7,8,12,13)+d(1,15)$	Understand	13
17	Discuss the different operators used in boolean algebra and give Tracts tables for them? Explain the testing strategies for KV charts?	Understand	13
18	State the representation of minterm and maxterm for three variables(D+M) Minimize the given expression using four variable k-map. F(A,B,C,D)= _ m(0,1,3,4,7,8,15).	Remember	13
19	Explain the terms i. Decision table processors ii. Expansion of immaterial cases iii. Test case design	Understand	12
20	Define the terms predicate, relational operator of case statements And multi valued logics?	Understand	13
GROUP-III (ANALYTICAL QUESTIONS)			
UNIT – IV			
S. No.	**Question**	**Blooms Taxonomy Level**	**Course Outcome**

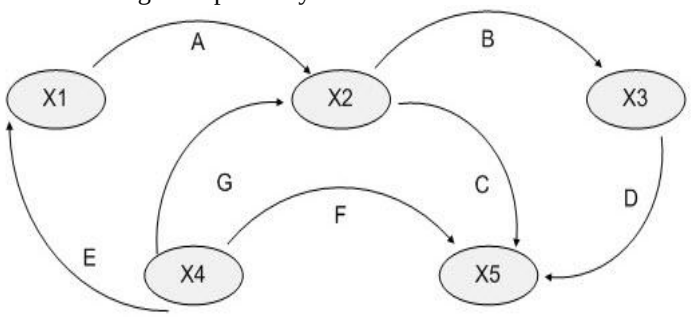
1	Describe the minimum combination of paths required to provide full statement coverage? 	Remember	10

2	Given the following highly simplified procedure
	Ask: "What type of ticket do you require, single or return?"
	IF the customer wants return
	Ask: "What rate, Standard or Cheap-day?"
	IF the customer replies Cheap-day
	Say: "That will be 11:20"
	ELSE
	Say: "That will be 19:50"
	ENDIF
	ELSE
	Say: "That will be 9:75"
	ENDIF
	Calculate the minimum number of tests that are needed to ensure that all the questions have been asked, all combinations have occurred and all replies given.
		Understand	11

3	Explain the relations between regular expressions and flow anomaly detection with an example. If X and Y are following path expressions, answer the given questions. X = abc + def + ghi Y = uvw + z i) Find value of XY ii) Is XY = YX. Justify your answer.	Understand	11

<table>
<tr>
<td>4</td>
<td>Consider the following decision table for car rental.
<table>
<tr><td>Conditions</td><td>Rule 1</td><td>Rule 2</td><td>Rule 3</td><td>Rule 4</td></tr>
<tr><td>Over 23?</td><td>F</td><td>T</td><td>T</td><td>T</td></tr>
<tr><td>Clean driving record?</td><td>Don't care</td><td>F</td><td>T</td><td>T</td></tr>
<tr><td>On business?</td><td>Don't care</td><td>Don't care</td><td>F</td><td>T</td></tr>
<tr><td>Actions</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Supply rental car?</td><td>F</td><td>F</td><td>T</td><td>T</td></tr>
<tr><td>Premium charge</td><td>F</td><td>F</td><td>F</td><td>T</td></tr>
</table>
Given this decision table, Discuss what is the expected result for the following test cases?</td>
<td>Understand</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>Given the following decision table:
<table>
<tr><td></td><td>Rule 1</td><td>Rule 1</td><td>Rule 1</td><td>Rule 1</td></tr>
<tr><td>Conditions</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Frequent Flyer</td><td>Gold</td><td>Gold</td><td>Silver</td><td>Silver</td></tr>
<tr><td>Class</td><td>Business</td><td>Economy</td><td>Business</td><td>Economy</td></tr>
<tr><td>Actions</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Free Upgrade</td><td>First</td><td>Business</td><td>No</td><td>Business</td></tr>
<tr><td>Discounted Upgrade</td><td>N/A</td><td>First</td><td>First</td><td>None</td></tr>
</table>
Describe what is the expected result for each of the following test cases?</td>
<td>Understand</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>Given the following state transition diagram:


Demonstrate which of the test cases below will cover the following series of state transitions?
SS - S1 - S2 - S1 - S2 - ES</td>
<td>Understand</td>
<td>13</td>
</tr>
</table>

<table>
<tr><td>7</td><td>Define how many test cases are required to cover 100% 0 - switch coverage respectively from X2?
 
</td><td>Remember</td><td>13</td></tr>
<tr><td>8</td><td>Given the following decision table .Name which of the following test cases and expected results is valid?
<table>
<tr><td></td><td>Rule 1</td><td>Rule 2</td><td>Rule 3</td><td>Rule 4</td></tr>
<tr><td>Conditions</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Age</td><td><21 yrs</td><td>21-29 yrs</td><td>30-50yrs</td><td>> 50yrs</td></tr>
<tr><td>Insurance Class</td><td>A</td><td>A or B</td><td>B. C or D</td><td>C or D</td></tr>
<tr><td>Actions</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Premium</td><td>100</td><td>90</td><td>70</td><td>70</td></tr>
<tr><td>Excess</td><td>2,500</td><td>2,500</td><td>500</td><td>1000</td></tr>
</table></td><td>Understand</td><td>13</td></tr>
<tr><td>9</td><td>Explain the following functions using K-Maps
F(A,B,C,D) = P(4,5,6,7,8,12,13)+d(1,15)</td><td>Understand</td><td>13</td></tr>
<tr><td>10</td><td>Explain how can we form specifications into sentences? Write down different phrases that can be used for words?</td><td>Understand</td><td>13</td></tr>
<tr><td>11</td><td>Demonstrate by means of truth tables the validity of the following theorems of Boolean algebra
i. Associative Laws
ii. Demorgan's theorems for three variables
iii. Distributive Law
iv. Absorption Rule</td><td>Understand</td><td>13</td></tr>
<tr><td>12</td><td>Discuss an example of decision table testing for a financial application applied at the system level?</td><td>Understand</td><td>13</td></tr>
<tr><td colspan="4">GROUP - A (SHORT ANSWER QUESTIONS)</td></tr>
<tr><td colspan="4">UNIT-V</td></tr>
<tr><td>S. No.</td><td>Question</td><td>Blooms Taxonomy Level</td><td>Course Outcome</td></tr>
<tr><td>1.</td><td>Explain state graphs and explain about equivalent states?</td><td>Understand</td><td>14</td></tr>
<tr><td>2.</td><td>Define transition and discuss unreachable states?</td><td>Remember</td><td>14</td></tr>
<tr><td>3.</td><td>Explain about state tables and define dead states?</td><td>Understand</td><td>14</td></tr>
<tr><td>4.</td><td>Compare time and sequence and explain about state bugs?</td><td>Understand</td><td>14</td></tr>
<tr><td>5.</td><td>Explain input encoding and input alphabet and illustrate output errors?</td><td>Understand</td><td>14</td></tr>
<tr><td>6.</td><td>Discuss output encoding and output alphabet and explain encoding bugs?</td><td>Understand</td><td>14</td></tr>
<tr><td>7.</td><td>Demonstrate state codes and state symbol products and explain limitations of state graphs?</td><td>Understand</td><td>14</td></tr>
</table>

8.	Explain the application comments for designers and testers?	Understand	14
9.	Explain switches, flags and unachievable paths and demonstrate unspecified and contradictory transitions?	Understand	14
10.	Define graph matrix and explain out-degree and in-degree?	Remember	15
11.	Explain connection matrix and explain about relations?	Understand	15
12.	Explain properties of relations and define parallel reduction?	Understand	15
13.	Define equivalence relation and explain loop reduction?	Remember	15
14.	Explain partial ordering relations and demonstrate cross-term reduction?	Understand	15
15.	Explain the powers of a matrix and define node reduction optimization?	Understand	16
16.	Discuss matrix power and products and illustrate linked list representation of graph matrices?	Understand	16
17.	Demonstrate set of all paths and define loops?	Understand	16
18.	Explain partitioning algorithm of graph matrices?	Understand	16
19.	Discuss node reduction algorithm of graph matrices?	Understand	16

GROUP-B (LONG ANSWER QUESTIONS)

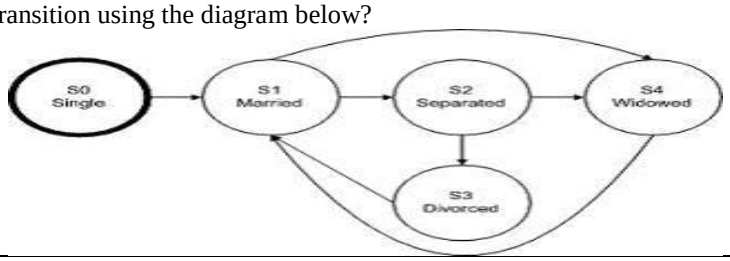
UNIT – V

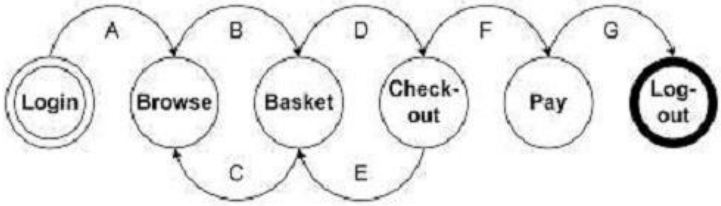
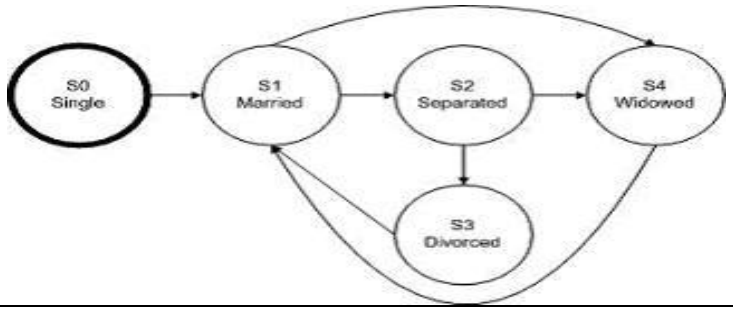
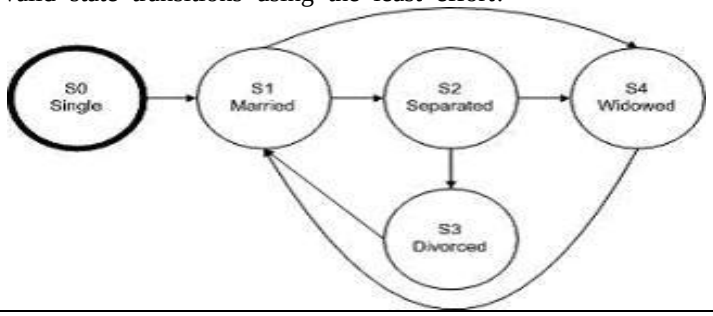
S. No.	Question	Blooms Taxonomy Level	Course Outcome
1	Discuss the principles of state testing? Explain its advantages and Disadvantages?	Understand	14
2	Compare the differences between logic based testing , state testing And path testing? And Explain all the rules in the conversion of specification into a stateGraph?	Understand	14
3	Explain the terms i. No of states ii. Impossible states iii. Equivalent States	Understand	14
4	Demonstrate the software implementation issues in state testing?. Discuss tester's comments about state graphs?	Understand	14
5	Explain state testing and testability tips with an example? And Explain state graphs with implementation with an example?	Understand	14
6	Define the following terms i. States ii. Inputs and transitions iv. Outputs iv. State tables	Remember	14
7	Illustrate designer's comments about state graphs? And Draw a hard disk recovery a state graph with a state table?	Understand	14
8	Explain and write a short notes on i. Switches, Flags, unachievable paths. ii. Essential an Inessential finite state behaviour	Understand	14
9	Demonstrate design guidelines for building finite state machines into your code?	Understand	14
10	Demonstrate an algorithm for node reduction (general)? And Illustrate the applications of node reduction algorithm?	Understand	15
11	Discuss a node reduction algorithm in terms of matrix operations? And Define graph matrices and their applications?	Understand	15
12	Illustrate a partitioning algorithm with an example? Discuss strategy to write an algorithm for all pairs paths using matrix operations?	Understand	16
13	Discuss relative merits and demerits of different graph matrix Representations?	Understand	16
14	Demonstrate the operations does a toolkit consist for the representation of graphs Illustrate about matrix powers and products	Understand	16

15	Demonstrate the advantages of array representations? And Describe loops and demonstrate loops in matrix representation?	Understand	16
16	Discuss the linked list representation? And Demonstrate the matrix operations in tool building?	Understand	16
17	Define graph matrices and evaluate graph matrix with pictorial Graph explains the basic algorithms? And Demonstrate maximum element and minimum element of a graph?	Understand	15
18	Explain the properties of relations? Explain them with example	Understand	16
19	Explain parallel reduction and loop reduction? And Write about equivalence relation and partial ordering relation?	Understand	16

GROUP-III (ANALYTICAL QUESTIONS)

UNIT - V

S. No.	Question	Blooms Taxonomy Level	Course Outcome
1	Consider Postal rates for 'light letters' are 25p up to 10g, 35p up to 50g plus an extra 10p for each additional 25g up to 100g. Discuss which test inputs (in grams) would be selected using equivalence partitioning	Understand	14
2	If thermometer measures temperature in whole degrees only. If the temperature falls below 18 degrees, the heating is switched off. It is switched on again when the temperature reaches 21 degrees. Name the best values in degrees to cover all equivalence partitions?	Remember	14
3	Explain a system designed to work out the tax to be paid: An employee has 4000 of salary tax free. The next 1500 is taxed at 10%.The next 28000 after that is taxed at 22%.Any further amount is taxed at 40%.To the nearest whole pound, Discuss which of these groups of numbers fall into three different equivalence classes?	Understand	14
4	Consider there is one application, which runs on a single terminal. there is another application that works on multiple terminals. Demonstrate what are the test techniques you will use on the second application that you would not do on the first application? which test suite will check for an invalid transition using the diagram below? 	Understand	14
5	Consider the following state table: <table><tr><th></th><th>On</th><th>Off</th><th>Channel 1</th><th>Channel 2</th><th>Channel >2</th><th>Stby</th></tr><tr><td>Standby</td><td>Live</td><td>N</td><td>N</td><td>N</td><td>N</td><td>N</td></tr><tr><td>Live</td><td>N</td><td>Standby</td><td>Display Channel 1</td><td>Display Channel 2</td><td>N</td><td>Standby</td></tr><tr><td>Display Channel 1</td><td>N</td><td>N</td><td>N</td><td>Display Channel 2</td><td>Live</td><td>Standby</td></tr><tr><td>Display Channel 2</td><td>N</td><td>N</td><td>Display Channel 1</td><td>N</td><td>Live</td><td>Standby</td></tr></table> Demonstrate which of the following represents an invalid transition (N)?	Understand	14

6	Consider the following state transition diagram .Show which of the following series of state transitions contains an invalid transition which may indicate a fault in the system design? 	Understand	14
7	Without testing all possible transitions, Demonstrate which test suite will test all marital statuses? 	Understand	14
8	Using the diagram below, Explain which test suite will check for all valid state transitions using the least effort? 	Understand	14

<table>
<tr>
<td>9</td>
<td>Consider Four testers each submitted an incident report in which each reported a problem with the user log-on process. User log-on is a critical component of the system. The table below describes the four defect reports submitted?
<table>
<tr><th>Tester ID</th><th>Incident Description</th><th>Inputs / Expected & Actual Results</th><th>Business Priority (1 High 2 Medium 3 Low)</th></tr>
<tr><td>Tester 1</td><td>User Log-on validation error</td><td>Entered user ID of Ram Kumar & password ABCREATE but got an error message</td><td>1</td></tr>
<tr><td>Tester 2</td><td>Log-on does not meet requirements</td><td>Inputs: Entered valid user ID & password
Expected result: Main menu screen to be displayed
Actual result: Error saying incorrect password</td><td>2</td></tr>
<tr><td>Tester 3</td><td>Log-on password validation error</td><td>Inputs: User ID Ram Kumar & password ABCREATE
Expected result: Main menu screen
Actual result: Error Message – “Incorrect password”
This test has worked many times before</td><td>2</td></tr>
<tr><td>Tester 4</td><td>Password validation error</td><td>Inputs: User ID Ram Kumar & password ABCREATE
Expected result: Main menu screen
Actual result: “Incorrect password”
N. B: The same inputs worked yesterday, before code release 1.2 was delivered</td><td>1</td></tr>
</table>
Demonstrate which tester has reported the incident most effectively, considering the information and priority they have supplied?</td>
<td>Understand</td>
<td>14</td>
</tr>
<tr><td>10</td><td>Explain win runner testing process?</td><td>Understand</td><td>16</td></tr>
<tr><td>11</td><td>Discuss how does win runner recognize objects on the application?</td><td>Understand</td><td>16</td></tr>
</table>

12	If a company is going to provide their employees with a bonus which will be based on the employee's length of service in the company. The bonus calculation will be zero if they have been with the company for less than two years, 10% of their salary for more than two but less than five years, and 25% for five to ten years, 35% for ten years or more. The interface will not allow a negative value to be input, but it will allow a zero to be input. Demonstrate how many equivalence partitions are needed to test the calculation of the bonus?	Understand	15
13	An automated air-conditioner is programmed to turn its heating unit on when the temperature falls below 17 Deg. C and to turn its refrigeration unit on when the temperature exceeds 26 Deg. C. The air-conditioner is designed to operate at temperatures between -10 Deg. C and +40 Deg. C. Given the above specification, Estimate which of the following sets of values shows that the equivalence partition test design technique has been used correctly?	Understand	15
14	An employee's bonus is to be calculated. It cannot become negative, but it can be calculated to zero. The bonus is based on the duration of the employment. An employee can be employed for less than or equal to 2 years, more than 2 years but less than 5 years,5 to 10 years, or longer than 10 years. Depending on this period of employment, an employee will get either onus or a bonus of 10%, 25% or 35%.Estimate how many equivalence partitions are needed to test the calculation of the onus?	Understand	15
15	Explain the advanced scripting techniques for test execution tools?	Understand	15
16	Discuss the potential benefits from using tools in general to support testing?	Understand	15
17	Explain the goal for a proof-of-concept or pilot phase for tool evaluation?	Understand	15

Prepared By: Mrs B Pravallika Assistant Professor, IT

Date: 21 Dec, 2017

HOD, IT