VIDYA ACADEMY OF SCIENCE AND TECHNOLOGY

TECHNICAL CAMPUS, KILIMANOOR

(A Unit of Vidya International Charitable Trust)

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S8 CSE QUESTION BANK

CST402 DISTRIBUTED COMPUTING

MODULE 1			
Sl. No	**Questions**	**Marks**	**KTU/KU Month/Year**
1	List any 4 issues in the design of a distributed system.	4	DEC 18, Sep-20
2	Identify any three distributed applications and for each application, determine which all motivating factors are important for building an application over a distributed system.	3	MODEL QUESTION PAPER
3	Write notes on mobile and ubiquitous computing.	4	DEC 18
4	Assume that the surface of the past cone form a consistent cut. Does it mean that all events on the surface of the past cone are always concurrent? Demonstrate with the help of an example.	3	MODEL QUESTION PAPER
5	Explain how multimedia services are supported in distributed systems.	4	MAY19
6	Which are the different versions of send and receive primitives for distributed communication? Explain.	8	MODEL QUESTION PAPER
7	"The absence of these two transparencies most strongly affects the utilization of distributed resources". Identify and explain the above two types of transparencies with examples.	4	MAR 2020
8	Explain the three different models of the service provided by communication networks.	6	MODEL QUESTION PAPER
9	Explain how the causal dependency between events in distributed execution is defined using Lamport's happened before relationship.	8	MODEL QUESTION PAPER
10	Address the various strategies that can be adopted to satisfy the requirements of a reliable and fault tolerant distributed system.	6	MODEL QUESTION PAPER
11	In what all aspects distributed systems are better than centralized systems? Give examples of two applications for which distributed systems will be more suitable.	4	SEP 2020
12	What are the different communicating entities in a distributed system?	4	SEP 2020

MODULE 2			
Sl. No	**Questions**	**Marks**	**KTU/KU Month/Year**
1	Illustrate bully algorithm for electing a new leader. Does the algorithm meet liveness and safety conditions?	7	MODEL QUESTION
2	Clearly mentioning assumptions, explain the rules of termination detection using distributed snapshots.	7	MODEL QUESTION
3	In Chandy-Lamport algorithm for recording global snapshots, explain how the recorded local snapshots can be put together to create the global snapshot. Can multiple processes initiate the algorithm concurrently?	7	MODEL QUESTION
4	Illustrate the working of spanning tree based termination detection algorithm	4	MODEL QUESTION
5	Specify the issues in recording a global state.	3	MODEL QUESTION
6	Explain the rules used to update clocks in scalar time representation..	3	MODEL QUESTION
7	Apply ring-based leader election algorithm with 10 processes in the worst-performing case. Count the number of messages needed.	7	MODEL QUESTION
8	Apply spanning tree-based termination detection algorithm in the following scenario. The nodes are processes 0 to 6. Leaf nodes 3, 4, 5, and 6 are each given tokens T3, T4, T5 and T6 respectively. Leaf nodes 3, 4, 5 and 6 terminate in the order, but before terminating node 5,it sends a message to node 1.	7	MODEL QUESTION
9	Explain Termination detection by weight throwing.	5	MODEL QUESTION
10	Explain Spanning-tree-based algorithm	5	MODEL QUESTION

MODULE 3			
Sl.No	**Questions**	**Marks**	**KTU/KU Month/Year**
1	Describe how quorum-based mutual exclusion algorithms differ from the other categories of mutual exclusion algorithms.	3	MODEL QUESTION PAPER

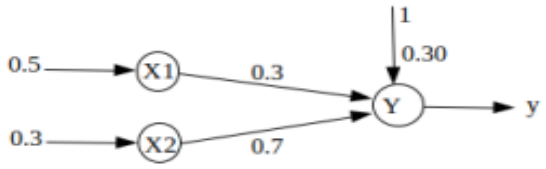
2	Explain with example, how wait-for-graphs can be used in deadlock detection.	3	MODEL QUESTION PAPER
3	Explain and illustrate Lamport's mutual exclusion algorithm.	8	MODEL QUESTION PAPER
4	Discuss the three types of messages required for deadlock handling in Maekawa's algorithm. Explain how Maekawa's algorithm handles deadlocks.	6	MODEL QUESTION PAPER
5	Explain and illustrate Ricart- Agrawala algorithm for achieving mutual exclusion.	8	MODEL QUESTION PAPER
6	Explain any three different models and issues of deadlock	6	MODEL QUESTION PAPER
7	What are the requirements of mutual exclusion algorithms?	5	MODEL QUESTION
8	Illustrate Suzuki- Kasami's broadcast algorithm.	7	MODEL QUESTION
9	Explain deadlock handling strategies	5	MODEL QUESTION

MODULE 4

Sl. No	Questions	Marks	KTU/KU Month/Year
1	What are the issues in failure recovery? Illustrate with suitable examples.	7	DEC 18
2	Show that Lamport's Bakery algorithm for shared memory mutual exclusion, satisfy the three requirements of critical section problem.	7	DEC 18
3	Differentiate consistent and inconsistent states with examples.	4	DEC18
4	What is check point-based rollback-recovery? Explain the three classifications of check point-based rollback-recovery	10	DEC 18
5	Define the no-orphans consistency condition.	3	MAY 19

6	List any three advantages of using distributed shared memory.	3	MAY 19
7	Illustrate the detailed abstraction of distributed shared memory and interaction with application processes.	5	MAY 19
8	Classify different log based roll back recovery techniques.	5	MAY 19
9	Explain Lamport's bakery algorithm	7	MAR 2020
10	Describe log based roll back recovery.	7	MAR 2020
MODULE 5			
Sl.No	**Questions**	**Marks**	**KTU/KU Month/Year**
1	Define Byzantine agreement problem.	3	MODEL QUESTION
2	What do you mean by Vice and Venus in AFS?. What are their roles?	6	DEC 18
3	Summarize any five Distributed File System requirements.	6	DEC 18
4	Explain NFS Architecture with diagram	6	DEC 18
5	Differentiate Andrew file system and NFS	4	MAY 19
6	How does Andrew File System ensure that the cached copies of files are up-to-date?	6	MAY 19
7	Briefly explain different types of navigations used for name resolution	6	MAY 19
8	With appropriate diagram explain the distribution of processes in the Andrew File System	4	MAR 2020
9	Differentiate between whole file serving and whole file caching in Andrew file system	3	MODEL QUESTION
10	Differentiate Andrew file system and NFS.	4	MODEL QUESTION
11	Explain Sun NFS architecture with diagram.	10	MODEL QUESTION
12	Explain consensus algorithm for crash failures under synchronous systems.	6	MODEL QUESTION
13	Summarize distributed file system requirements	8	MODEL QUESTION

CST 444 SOFT COMPUTING

Module I			
Sl. No	Questions	Marks	Year
1	Differentiate between the problem solving strategies: Soft computing and Hard computing.?	3	KTU (S,FE) 2021
2	What is the role of activation function in Artificial Neural Network (ANN)? Write and explain any two activation functions of ANN.	3	KTU(S,FE)2021
3	Implement AND function using Mc Culloch-Pitts neuron. Use binary data.	6	KTU(S,FE)2021
4	Calculate the net input to the neuron Y for the network shown in figure. 	5	KTU(S,FE) 2021
5	Explain the five basic architectures of ANN based on connection.	4	KTU(S,FE) 2021
6	"The Hebb rule is more suited for Bipolar data than binary data." Justify the statement.?	3	DEC 2021
7	Explain the training algorithm of Hebb network.	3	KTU (S,FE) JAN 2022
8	What are the different types of learning methods employed in neural networks?	4	KTU (S,FE) JAN 2022
9	Implementation of logic gates using i) MP neuron ii) Hebb network --AND,OR,NOR,XOR ,AND, NOT etc.	8	MODEL QUESTION
10	Obtain the output of the neuron for a network with inputs are given as [x1, x2] = [0.7, 0.8] and the weights are [w1, w2] = [0.2, 0.3] with bias = 0.9. Use i) Binary sigmoidal activation function ii) Bipolar sigmoid activation function	8	MODEL QUESTION
11	Design a Hebb net to implement NOR function using with bipolar inputs and targets.	6	KTU (R,S) DEC 2020

12	A 4-input neuron has weights 1, 2, 3 and 4. The transfer function is linear with the constant of proportionality being equal to 2. The inputs are 4, 10, 5 and 20 respectively. Predict the output?	6	MODEL QUESTION
13	Implement AND(x1, x2) where x1, x2 is an element of {0,1} using MP neuron.	4	MODEL QUESTION
Module II			
1	What are the activations used in backpropagation network algorithm	3	KTU (PT)DEC 2021
2	State the testing algorithm used in perceptron algorithm.	4	KTU (PT)DEC 2021
3	How is error propagated in backpropagation network? Explain the phase II of BPN training algorithm.	5	KTU (S,Fe)Jan 2022
4	Implement OR function using perceptron training algorithm with binary inputs and bipolar targets. (up to 2 epochs)	4	KTU Dec 2020
5	Draw the architecture of back propagation network and write training algorithm.	6	KTU Dec 2020
6	Explain the architecture and training algorithm of Adaline network . Use Adaline nerwork to train NOR logic function with bipolar inputs and targets. Perform 2 epochs of training.	8	Model Question
7	Discuss the training algorithm and explain the weight updates in back propagation networks	10	Model Question
8	Explain how synaptic weights are adapted iteration by iteration using error correction rule in Perceptron convergence algorithm for an OR gate with bipolar inputs and outputs. Initial weights are all zero and learning rate parameter η=0.1	10	Model Question
9	Explain Perceptron convergence theorem and discuss Perceptron algorithm based on XOR logic function.	4	Model Question
10	Implement OR function using Adaline network. Use bipolar inputs. Perform one epoch of training.	6	Model Question
Module III			

1	Define (i) core (ii) support (iii) boundary of a fuzzy set.	5	KTU DEC 2020
2	List the properties of fuzzy set.	5	KTU DEC 2020
3	Differentiate between fuzzy tolerance and equivalence relation. How can we convert fuzzy tolerance relation to fuzzy equivalence relation?	3	KTU Dec 2020
4	Using your own intuition and your own definitions of the universe of discourse, plot fuzzy membership functions for "Age of people": (i) Very young (ii) Young (iii) Middle-aged (iv) Old (v) Very old	3	KTU Dec 2020
5	Define composition operation in fuzzy relations? Two fuzzy relations R and S are given below. Obtain the composition T of these fuzzy relations using $\underset{\sim}{R} = \begin{array}{c} \\ x1 \\ x2 \end{array}\begin{array}{c} \begin{array}{cc} y1 & y2 \end{array} \\ \begin{bmatrix} .5 & .2 \\ .3 & .8 \end{bmatrix} \end{array}$ $\underset{\sim}{S} = \begin{array}{c} \\ y1 \\ y2 \end{array}\begin{array}{c} \begin{array}{ccc} z1 & z2 & z3 \end{array} \\ \begin{bmatrix} 1 & .5 & .2 \\ .8 & .4 & .6 \end{bmatrix} \end{array}$ i)Max-min composition ii)Max-product composition	9	KTU (S,FE) 2022
6	Given two fuzzy sets A and B, compute the following set operations on A and B: a) Algebraic sum b) Algebraic product c) Bounded sum d) Bounded difference $\underset{\sim}{A} = \left\{\frac{1}{2} + \frac{0.5}{3} + \frac{0.3}{4} + \frac{0.2}{5}\right\}$ $\underset{\sim}{B} = \left\{\frac{0.5}{2} + \frac{0.7}{3} + \frac{0.2}{4} + \frac{0.4}{5}\right\}$	5	KTU (S,FE) 2022
	Module IV		
1	Apply Mamdani fuzzy model to design a controller to determine the wash time of a domestic washing machine. Assume input is dirt and grease of the cloth. Use three descriptors for input variable and five descriptors for output variables .Derive the set of rules for controller action and defuzzification. Design should be supported by figure wherever possible.	10	Model Question

2	Using inference approach, find the membership values for each of the triangular shapes (I, R, IR, T) for a triangle with angles 120°, 50°, 10°.	8	Model Question
3	Explain Single-Point Crossover and Two-Point Crossover with example.	4	Model question
4	Differentiate between value encoding and permutation encoding.	8	Model Question
5	Explain the stopping conditions for genetic algorithm.	6	Model question
6	Explain five different types of selection and crossover genetic operators.	10	KTU(S,FE)JAN2022
7	With block diagram explain about Fuzzy Inference system.	5	KTU DEC2020
8	With an example explain Mamdani FIS model.	6	KTU(PT)DEC 2021
9	List out the various encoding techniques in GA with examples for each	5	KTU(PT)DEC 2021
MODULE V			
1	Explain convex and non convex MOOP? How to find a non dominated set.	10	Model Question
2	What are the properties of dominance relation?	4	Model Question
3	Explain Genetic Neuro-Hybrid System with block diagram. Also write the advantages of Genetic- Neuro Hybrid systems	8	Model Question
4	Discuss the classification of Neuro-Fuzzy Hybrid System.	6	Model Question
5	Give the properties of Genetic-neuro hybrid systems with a block diagram.	7	Model question
6	With suitable example,explain about different methods of encoding that are possible in genetic algorithm.	5	Model Question
7	List the various advantages of Genetic-neuro hybrid systems.	3	Model Question
8	Explain cooperative Neural Fuzzy systems.	5	Model Question
9	Explain a simple genetic algorithm with an example	5	Model Question

CS 476 - MOBILE COMPUTING

MODULE 1

S.No.	Questions	Mark	Month & year
	Module-1		
1.	Explain different types of middleware and gateways required in the architecture of mobile computing	3	April/2018, Sept -2020& May/2019
2.	Explain the major segments to support mobile computing function with diagram	3	April/2018
3.	Explain in detail the three-tier architecture of mobile computing	9	April/2018
4.	Describe the following in Mobile IP with suitable figures a. Components of Mobile IP b. Data transfer to a Mobile node c. Reverse tunneling	9	April/2018
5.	Compare nomadic mobile computing and pervasive mobile computing	5	May/2019
6.	Discuss different types of mobility in mobile computing functions?	5	May/2019
7.	Differentiate between Telecommunication networks and Internet?	3	Sept -2020
8.	What are the functions of Transcoding Middleware? Give two examples?	4	Sept -2020
9.	Explain the various applications of mobile computing	5	Sept -2020
10.	List out and explain the design issues for mobile computing	4	Sept -2020
	Module-2		
1.	Highlight the differences between DSSS and FHSS	3	April/2018
2.	Compare and contrast Satellite systems-GEO, LEO and MEO	3	April/2018
3.	Elaborate the working of following medium access control protocols: a. TDMA b. FDMA c.CDMA	9	April/2018 & Sept-2020
4.	Explain Cellular Concepts, Channel assignment strategies and Hand-off strategies in detail using appropriate diagrams	9	April/2018 & Sep-2020
5.	Explain the architectural components and services of GSM technology with suitable diagrams	9	May/2019 & Sept -2020
6.	Why spread spectrum is used in wireless communication? List the benefits?	3	Sept -2020
7.	List out two Hand-off prioritization techniques?	4	Sept -2020
	Module-3		
1.	Explain in detail the architecture, multiple access and addressing mechanisms in IEEE 802.11 wireless LAN standard	9	April/2018, May/2019
2.	Distinguish between Adhoc network and Infrastructure network	3	May/2019
3.	Explain the architecture of IEEE 802.11 standard with suitable diagram	5	May/2019
4.	Draw and explain MAC frame format of IEEE 802.11	4	May/2019
5.	Explain the working procedure and protocol stack architecture of	10	May/2019 &

	Bluetooth technology with suitable diagrams		Sept -2020
Module-4			
1.	Describe the working of DHCP in Mobile computing with neat diagrams	3	April/2018, Sept -2020 & May/2019
2.	Explain the working of selective retransmission in TCP to support mobility	3	April/2018
3.	Highlight the differences between DSR and DSDV protocols	3	April/2018
4.	Explain in detail the working of Indirect TCP and Snooping TCP with example	9	April/2018
5.	Explain slow start mechanism in conventional TCP, what is the impact of high error rate and missing acknowledgements in wireless network on slow start?	10	April/2018
6.	Explain different requirements of Mobile IP	3	May/2019
7.	Compare the following mobile transport layer protocols (i) Indirect TCP (ii) Snooping TCP (iii) Mobile TCP (iv) T-TCP	10	April-2018, May/2019
8.	Classify and explain the routing algorithms used in Mobile Ad hoc Network (MANET).	10	April-2018, Sept -2020
9.	Write the limitations of conventional TCP (for wired network) to be used in mobile networks	3	Sept -2020
10.	Describe the working of Dynamic Source Routing with suitable example	9	May/2019, Sept -2020
11.	Describe the following Terminologies used in Mobile IP a) Home Agent (HA) b) Foreign Agent (FA) c) Care-of Address (COA)	3	Sept -2020
12.	Explain about Mobile Transport Layer approaches and compare it's pros and cons?	10	Sept -2020
13.	With neat sketches and illustration, discuss the WAP architecture in detail.	10	Sept -2020
Module-5			
1.	What are the major components of security, explain each with examples	10	April/2018
2.	Explain network architecture and interfaces of next generation network-LTE	10	May/2019
3.	Discuss about various security issues in mobile computing	10	May/2019
4.	Briefly explain Super core concept in 5G? List two benefits?	4	Sept -2020
5.	What are the benefits of 5G wireless technology?	5	Sept -2020
6.	Discuss about the various security issues in mobile networks?	6	Sept -2020
7.	Explain the LTE architecture and Interface?	4	Sept -2020

CST 458 SOFTWARE TESTING

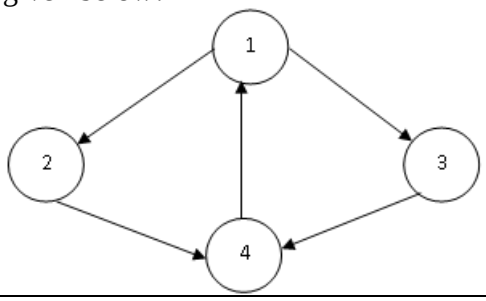
MODULE 1			
SL.NO	**QUESTIONS**	**MARK**	
1	Define the terms failure, error and fault.	3	MODEL
2	What are the different quality factors of a good software product?	3	MODEL
3	Compare verification and validation with respect to software testing process	8	MODEL
4	Explain the three different testing methods	6	MODEL
5	Explain the following types of testing (i)Black Box testing (ii) White Box testing (iii) GreyBox testing (iv) Unit testing (v) Integration testing (vi) System testing (vii) Acceptance testing	14	MODEL
6	Explain different levels of software testing in detail	14	MODEL

7	Explain the following coverage criteria based on the code fragment given below? (i) Functional coverage (ii) Statement coverage (iii)Conditional coverage (iv)Branch coverage
	int foo (int x, int y)
	{
	int z = 0;
	if ((x > 0) && (y > 0)){ z = x;}
	return z;
	}
		8	MODEL

8	Write positive and negative test cases for an ATM Machine?	6	MODEL
9	Explain about Test cases.	3	MODEL
10	Explain about Beta testing.	6	MODEL
MODULE 2			
1	Unit testing is done by the programmer who writes the code. Why?	3	MODEL
2	What is meant by functional program testing?	3	MODEL
3	Explain in detail, the steps in mutation testing	10	MODEL
4	Write notes on JUnit.	4	MODEL
5	Explain static unit testing in detail.	7	MODEL

6	Explain dynamic unit test in detail.	7	MODEL
7	Define Ground string, Mutation score, and Mutants?	3	MODEL
8	What are the functions of Test driver and Test stubs in dynamic unit testing?	3	MODEL
9	Explain the major difference between control flow testing and data flow testing.	6	MODEL
10	Explain seven types of mutation operators with neat examples?	14	MODEL
	MODULE 3		
1	What is du pair in a data flow graph? Give example	3	MODEL
2	Draw the control flow graph for 'switch' and 'for' statement	3	MODEL
3	Explain the steps for data flow testing in detail	8	MODEL
4	Explain the following terms with example i) coupling du pair ii) method and call coverage	6	MODEL
5	Write note on inheritance testing	4	MODEL

6	Draw the CFG for the following two code segments.
	`if ( x < y )`
	`{`
	`  y = 0;`
	`  x = x + 1;`
	`}`
	
	`x = 0;`
	`while (x < y)`
	`{`
	`  y = f (x, y);`
	`  x = x+1;`
	`}`
		10	MODEL

7	Define Node coverage, Edge coverage and Prime path coverage in a control flow graph?	3	MODEL
8	What are du paths and du pairs in a data flow graph?	3	MODEL
9	Explain touring, side trips and detours with a neat example	7	MODEL
10	Explain simple path coverage and prime path coverage with the help of CFG given below?  	7	MODEL
11	Draw CFG fragment for (i) Simple if (ii) Simple while loop (iii) Simple for loop	7	MODEL
12	Explain the following concepts with examples? (i)Call graph (ii) Inheritance graph (iii) Coupling du-pairs	7	MODEL

	MODULE 4		
1	What are the two approaches of input domain modelling? Explain	3	MODEL
2	List the four key aspects in functional testing.	3	MODEL
3	Domain testing is an intelligent method of testing. Justify your answer by explaining different criteria for combining multiple partitions in domain testing.	14	MODEL
4	Explain the types in functional testing	7	MODEL
5	Explain the steps in functional testing	7	MODEL
6	Briefly explain input domain modelling approaches?	7	MODEL
7	Consider the triangle classification program with a specification: The program reads floating values from the standard input. The three values A, B, and C are interpreted as representing the lengths of the sides of triangle. The program then prints a message to the standard output that states whether the triangle, if it can be formed, is scalene, isosceles, equilateral, or right angled. Determine the following for the above program: (i) For the boundary condition A +B > C case (scalene triangle), identify test cases to verify the boundary. (ii) For the boundary condition A = C case (isosceles triangle), identify testcases to verify the boundary. (iii) For the boundary condition A = B = C case (equilateral triangle), identify testcases to verify the boundary.	6	MODEL
8	Develop a decision table to generate test cases for this specification.	8	MODEL
9	Explain about multiple partitions of the input domain.	14	MODEL
10	Explain about random testing	7	MODEL
	MODULE 5		
1	What is symbolic execution tree? Give an example.	3	MODEL
2	Discuss the disadvantages of grey box testing	3	MODEL
3	Explain the various techniques for grey box testing in detail.	14	MODEL
4	Explain parameterized unit testing	6	MODEL
5	Explain the grey box testing methodology in detail.	8	MODEL
6	Explain the concept of symbolic execution with the help of a toy example?	3	MODEL
7	Explain the importance of grey box testing, its advantages and disadvantages?	9	MODEL
8	Consider the code fragment given below: - 1. POWER: PROCEDURE(X, Y); 2. Z ← 1; 3. J ← 1;	7	MODEL

	4. LAB: IF Y ≥ J THEN 5. DO; Z← Z * X; 6. J ← J + 1; 7. GO TO LAB; END; 8. RETURN (Z) ; 9. END; Explain Symbolic execution of POWER (αl, α2).		
9	Explain Execution tree for POWER (αl, α2).	7	MODEL
10	Explain about Orthogonal Array Testing	3	MODEL