



Harcourt Butler Technical University
Kanpur

END
SEM
EXAM
2023-24

Branch	CSE/IT	Program	B.Tech
Course Name	Software Testing	Semester	VII
CourseCode	ECS-491	Year	IV
Time:	02:30 Hr	Maximum Marks	50

Knowledge Level(KL)	K1:Remembering K2:Understanding	K3:Applying K4:Analysing	K5:Evaluating K6:Creating
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Note: Answer All Questions

Q.No	Questions	Marks	COs	KL
1	Attempt both questions.			
(a)	Define testing objectives. What are the principles of testing?	5	CO1	K1
(b)	Define software quality and reliability. What is the difference between testing and debugging?	5	CO1	K1
2.	Attempt both questions.			
(a)	Discuss white box testing with all its types. How can you compute the cyclomatic complexity of a program? How is cyclomatic complexity useful in program testing?	5	CO2	K5
(b)	What do you understand by black box testing? Give a broad classification of its different types. Design the black-box test suite for a function that checks whether a character string (of up to twenty-five characters in length) is a palindrome.	5	CO2	K3
3.	Attempt both questions:			
(a)	What is the difference between top-down and bottom-up integration testing approaches? What are their advantages and disadvantages? Explain your answer using an example. Why is the mixed integration testing approach preferred by many testers?	5	CO3	K1
(b)	Do you agree with the following statement—“System testing can be considered a pure black-box test.” Justify your answer.	5	CO3	K4
4.	Attempt both questions.			
(a)	Explain Adhoc testing. Discuss pair and exploratory testing.	5	CO4	K2

(b)	What do mean by sanity testing? Define test minimization and dynamic slicing.	5	CO4	K2
5.	Attempt both questions:			
(a)	What are the implications of the inheritance, polymorphism, and encapsulation features of an object-oriented program in satisfactory testing of the program?	5	CO5	K2
(b)	What do you understand by Test automation? What is the scope of automation? Define generic requirements for the test tool framework.	5	CO5	K1

Course Outcomes	CO1	Understand the various types and principles of Software Testing (Understand)
	CO2	Understand white box and black box testing. (Understand)
	CO3	Apply Integration, System, and Acceptance Testing. (Apply)
	CO4	Design Test selection & minimization for regression testing. (Apply)
	CO5	Analyze Test Management and Automation. (Apply)



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END
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Branch	CSE/IT		Program	B.Tech
Course Name	Data Warehousing and Data Mining		Semester	VII
Course Code	EIT-463		Year	IV (2023)
Time:	02:30 Hr		Maximum Marks	50
Knowledge Level(KL)	K1:Remembering K2.Understanding	K3:Applying K4:Analysing	K5:Evaluating K6:Creating	

Note: Answer All Questions

Q.No	Questions	Marks	COs	KL
1.	Attempt both questions. (a) What is KDD? Explain about data mining as a step in the process of knowledge discovery. (b) What is data cleaning? Explain the steps involved in data cleaning.	5	CO1	K1, K6
2.	Attempt both questions. (a) What is data generalization? Write short note on the following: i. q-q plots ii. Scatter plots iii. Loess curves iv. Standard deviation (b) What do you understand by the term association rule mining in large databases? Explain the weakness and strengths of Association rule analysis.	5	CO2	K1, K6
3.	Attempt both questions: (a) What is classification? Define classification by decision tree induction and classification by backpropagation. (b) Define the following: i. DBSCAN ii. OPTICS iii. CURE	5	CO3	K1, K2
4.	Attempt both questions. (a) Differentiate between OLTP database and data warehouse database. (b) Define three tier data warehouse architecture. What is data mart?	5	CO4	K1, K4
5.	Attempt both questions: (a) What are data warehouse recovery models? Define Disaster recovery. (b) What do you understand by OLAP? Define the operations performed on OLAP with example.	5	CO5	K1, K2

Course Outcomes	CO1	Understand importance of abstraction of Knowledge from unstructured sources at sufficient level. (Understand)
	CO2	Use of high level operational skills and real world case studies for knowledge discovery and data warehousing based principles. (Apply)
	CO3	Understand the areas of probability, statistics and machine learning algorithms which underpin the knowledge discovery enterprise. (Understand)
	CO4	Design data mining and data warehousing systems and solutions to meet user requirements and specifications. (Apply, Analyze)
	CO5	Compare and contrast OLAP and data mining as techniques for extracting knowledge from a data warehouse. (Evaluate)



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Branch	CSE/IT	Program	B. Tech
Course Name	MOBILE APPLICATION DEVELOPMENT	Semester	VII
Course Code	ECS-451	Year	2023-24
Time	2:30 Hr	Maximum Marks	50
Knowledge Level (KL)	K1: Remembering K2: Understanding	K3: Applying K4: Analyzing	K5: Evaluating K6: Creating

Note: Attempt all Questions

Q. No	Questions	Mark S	COs	KL
1	a) What are the distinguish features of mobile applications as compared to traditional desktop applications? b) What principles and practices are involved in generic User Interface (UI) development for mobile applications?	5x2=10	CO1	K1, K2
2	a) Discuss the main features and capabilities of Android Studio. b) Describe the typical workflow of developing an Android applications using Java.	5x2=10	CO2	K2
3	a) Describe the process of integrating mobile applications with cloud services. What benefits does this integration offer? b) How does the choice of networking protocols impact the performance of mobile applications?	5x2=10	CO3	K2
4	a) Explain the role of encryption in ensuring the security of sensitive data in mobile applications. b) Illustrate the enterprise requirements in mobile applications with the help of examples.	5x2=10	CO4	K3, K4
5	a) Explain the key testing methodologies specific to mobile applications. b) Describe the stages involved in the development process for mobile applications with the help of a labeled diagram?	5x2=10	CO5	K2

Course Outcomes	CO1	Understand technology and business trends impacting mobile applications.
	CO2	Understand and implement mobile application development languages.
	CO3	Understand the characterization and architecture of mobile applications.
	CO4	Understand and design enterprise scale requirements of mobile applications.
	CO5	Design and develop mobile applications using application development framework.



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Branch	FOOD TECHNOLOGY (Open Electives)	Program	B. Tech
Course Name	BASIC CONCEPT OF FOOD PROCESSING AND PRESERVATION	Semester	VII
Course Code	OFT 491	Year 2023-24	IV
Time: 2:30 Hr	Answer All Questions	Maximum Marks	50
Knowledge Level (KL)	K1: Remembering K2: Understanding	K3: Applying K4: Analysing	K5: Evaluating K6: Creating

Note: 1. Attempt all questions.
2. All questions carry marks, as shown against them.

Q. No.1	<p>a State the basic principles of food preservation. Classify various methods used for preservation of foods.</p> <p>b Describe the major nutrients of the food. Classify the foods on the basis of their functions</p>	Marks	COs	KL
Q. No.2	<p>a How does water activity affect food spoilage? Define Intermediate moisture food.</p> <p>b Explain preservation of foods by freezing, differentiate between slow and fast freezing of foods.</p>	5	CO2	K2
Q. No.3	<p>a Illustrate various steps of canning for high acid foods and their significance. Differentiate clearly between drying and dehydration.</p> <p>b Define the term blanching. Explain pasteurization and various methods of pasteurization.</p>	5	CO3	K2
Q. No.4	<p>a Discuss preservation of foods by using chemical preservatives. Differentiate Class I and Class II preservatives.</p> <p>b Discuss the principle and working of High Pressure Processing (HPP) and its applications in food preservations.</p>	5	CO4	K3
Q. No.5	<p>a Discuss the principle of Microwave Heating. State the advantages and limitations of microwave in food processing.</p> <p>b Differentiate clearly between food quality and food safety. Explain the working and principle texture profile analyzer.</p>	5	CO5	K3

Course Outcomes	CO1	Understand fundamental principles of food preservation	K2
	CO2	Understand the Basic concept of nutrients of food	K2
	CO3	Understand the principle of thermal processing and applying high temperature processing in food industry	K3
	CO4	Understand the principles of non-thermal preservation methods	K2
	CO5	Understand concepts of Food quality and role of total quality management system in food industry	K2

	Harcourt Butler Technical University Kanpur	END SEMESTER EXAM
Branch	PLASTIC TECHNOLOGY	Program
Course Name	INTRODUCTION TO POLYMER SCIENCE	Semester
Course Code	OPL 491	Year
Time: 2:30 Hr.	Answer All Questions	Maximum Marks
Knowledge Level (KL)	K1: Remembering K2: Understanding	K3: Applying K4: Analysing
		K5: Evaluating K6: Creating
		50

Note: 1. Attempt all questions.
2. All questions carry marks, as shown against them.

Q. No	Questions	Marks	COs	KL
1. (a) ✓	Give definition of polymer citing example. Discuss the classification of polymers on basis of Source of Availability, Tacticity, and Structure and give two example of each category.	5	CO1	K2
(b) ✓	Define the term "degree of polymerization" (DP) and Write down the chemical structure of Monomer and repeat unit of the following Polymers - a) Polyvinyl Chloride (PVC) b) Polyethylene terephthalate(PET) c) Polycarbonate d) Nylon 66 (e) Polystyrene	5	CO1	K4
2. (a) ✓	Analyze the kinetics of free radical polymerization and define an expression for rate of polymerization.	5	CO2	K4
(b) ✓	In a polymer sample 30% of molecules have a molecular mass 20,000, 40% have 30,000 and the rest 60,000. Calculate the number average, weight average molecular weight and poly-dispersity index (PDI) of the polymer.	5	CO2	K3,K5
OR				
	Describe the bulk polymerization technique and discuss the key steps involved in this polymerization technique. Provide examples of polymers synthesized using bulk polymerization and explain the significance of this technique in the polymer industry.			
3. (a) ✓	Describe the chemistry of synthetic & manufacturing process for production of polystyrene. Analyze its properties and applications.	5	CO3	K4
3. (b) ✓	Analyze the high pressure production process for manufacturing of Low density polythene (LDPE) with the help of a neat flow sheet.	5	CO3	K4
4. (a) ✓	Describe the production process for Urea formaldehyde resin. Analyze its properties and applications.	5	CO4	K4
(b) ✓	Analyze the difference between synthesis, properties and applications of Novolac and Resole type of Phenol Formaldehyde.	5	CO4	K4

5. (a)	Analyze the utility of polymer blends in commercial applications with the help of suitable example. OR Analyze the utility of plastic materials in the automobile industry and giving reasons for use in particular application.	5	CO5	K3
(b)	Describe the fundamental differences between homopolymers and copolymers. Analyze their utility for specific application and giving examples.	5	CO5	K4

Course Outcomes	CO 1	Understand basics of polymer science and their classifications.
	CO 2	Understand different types of polymerizations with mechanism and kinetics.
	CO 3	Understand and apply various production processes of commodity plastics
	CO 4	Understand chemistry and apply production of common formaldehyde based thermoset.
	CO 5	Understand and apply different plastic processing techniques, Indian markets of Plastics.



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SEM**

Branch	CSE / IT		Program	B. Tech
Course Name	ARTIFICIAL INTELLIGENCE		Semester	VII
Course Code	ECS 453		Year	2023-24
Time: 2:30 Hr	Answer All Questions		Maximum Marks	50
Knowledge Level (KL)	K1: Remembering K2: Understanding	K3: Applying K4: Analysing	K5: Evaluating K6: Creating	

Note: Attempt both parts of a question together at same contiguous space.

Q. No	Questions	Marks	COs	KL
1a	Why Best First Technique (A^* algorithm) does not properly work with problem state space represented in the form of AND-OR graph? Also, write down differences between A^* and AO^* techniques.	4	CO1	K4
1b	Prove that a worst case algorithm to solve the Travelling Salesman Problem is of exponential complexity. Suggest some good heuristics based algorithm to solve this problem and show that your algorithm is not, in general, optimal, but still often good.	4	CO1	K3
2a	Represent the following statements in Propositional or First Order Predicate Logic <ol style="list-style-type: none"> Anything anyone eats and is not killed by is food. Jack and Jill will both not go up the hill. Two persons are siblings if they have same parents. Teachers and Scientists are intelligent. Students like only good Teachers. 	4	CO2	K2
2b	Using method of resolution or otherwise prove the validity of following argument. <ol style="list-style-type: none"> $\forall x[D(x) \vee P(x) \rightarrow R(x)]$ $\forall x[C(x) \rightarrow I(x)]$ $\exists x[P(x) \wedge \neg I(x)]$ $\exists x[D(x) \wedge C(x)]$ Therefore, $\exists x[R(x) \wedge I(x)]$ 	4	CO2	K4
3a	Explain the Alpha- Beta Procedure of game playing with a suitable example. Why does search in game-playing programs always proceed forward from the current position rather than backward from goal?	4	CO3	K5
3b	Write down the general syntax of Frames used for knowledge representation and represent the following knowledge using frame structure. Bob is a Professor. He is 42 years old. His wife is Sandy and children are Joe & Sue. He lives at Street No. 100, City Dallas, State Texas and PIN 75000.	4	CO3	K5

4a	State the resolution principle. Discuss various types of resolution used in AI techniques.	4	CO4	K5
4b	<p>Consider the following sentences:</p> <ul style="list-style-type: none"> • John likes all kinds of food. • Apples are food. • Chickens are food. • Anything anyone eats and isn't killed by is food. • Bill eats peanuts and is still alive. • Sue eats everything Bill eats. <p>(i) Translate these sentences into Well Formed Formulas (WFF) in predicate logic.</p> <p>(ii) Prove that John likes peanut using backward chaining.</p> <p>(iii) Convert the above WFF into clausal form.</p> <p>(iv) Prove that John likes peanut using resolution.</p> <p>(v) Use resolution to answer the question, "What food does Sue eat?"</p>	4	CO4	K5
5a	What are advantages and drawbacks of using Scripts? Create a Script about attending a class lecture.	4	CO5	K1
5b	<p>Write Short Notes on any Two:</p> <ul style="list-style-type: none"> (i) Handling Uncertainty in AI (ii) Machine Perception Algorithms. (iii) JESS programming 	4	CO5	K1
6	<p>Lab component</p> <p>Write a PROLOG program that answers questions about family members and relationships. Include predicates and rules which define sister, brother, father, mother, grandchild, grandfather and uncle. The program should be able to answer queries such as following:</p> <p>?- father (X, bob). ?- grandson(X, Y). ?- uncle(bill,sue). ?- mother(mary,X).</p>	10	CO6	K6

Course Outcomes	CO1	Understand different types of AI agents (Understand).
	CO2	Understand and apply various AI search algorithms (uninformed, informed, heuristic, constraint satisfaction, genetic algorithms) (Understand, Apply).
	CO3	Understand the fundamentals of knowledge representation, reasoning, and machine learning techniques and apply them to real world problems. (Understand, Apply)
	CO4	Know how to build simple knowledge-based systems using languages like LISP, Prolog, and AI tools like JESS. (Apply)
	CO5	Carry out independent (or in a small group) research and communicate it effectively in a seminar. (Apply, Analyze)