Hall Ticket Number :

R-17

Code: 7G144

II B.Tech. II Semester Supplementary Examinations April 2023
Object Oriented Programming using JAVA
(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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			Marks	CO	BL
		UNIT–I			
1.	a)	Explain the benefits and applications of OOPs	7M	1	2
	b)	List and explain the java buzz words.	7M	1	1,2
		OR			
2.	a)	Write a java program to find any given number is palindrome or not	8M	1	3
	b)	Explain the importance of byte code in java programming	6M	1	2
		UNIT–II			
3.	a)	Write a program to demonstrate static variables, methods and blocks.	7M	2	3
	b)	Explain the differences between abstract class and interface	7M	2	2
		OR			
4.	a)	Differentiate between method overloading and method overriding with an example.	7M	2	2
	b)	Explain the keywords this, static, super and final with one example each.	7M	2	2
		UNIT–III			
5.	a)	Write a java program to display the priority of a thread.	7M	3	3
	b)	What is an exception? In what way it is differ from error? Explain.	7M	3	1,2
		OR			
6.	a)	With the help of an example, explain multithreading by extending Thread class	7M	3	2
	b)	Distinguish between final and finally keywords	7M	3	2
		UNIT–IV			
7.	a)	Write about the different lambda parameter passing techniques.	7M	4	3
	b)	Give brief description about the java's generic classes.	7M	4	1
		OR			
8.	a)	What are the restrictions on generics usage? Explain briefly.	7M	4	2
	b)	Explain predefine functional interfaces.	7M	4	2
		UNIT–V			
9.	a)	Explain the differences between Vector and Arrays. Explain the methods in Vector class.	7M	5	2
	b)	Explain various interfaces used in Collection framework?	7M	5	2
		OR			
10.	a)	Explain the importance of Hash set interface in java	7M	5	2
	b)	What is Scanner class? Describe the details of Scanner class.	7M	5	1,2

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II B.Tech. II Semester Supplementary Examinations April 2023

Operating Systems

(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	BL

UNIT–I

1.	a)	What is the purpose of an operating system? What are its design goals?	7M	CO1	L1
	b)	What are the essential properties of the batch, real-time, and distributed operating system?	7M	CO1	L1

OR

2.	a)	What is the purpose of interrupting? What are the differences between a trap and an interrupt?	7M	CO1	L4
	b)	What is distributed system? Explain with a neat diagram, how it is different from a computer network?	7M	CO1	L4

UNIT–II

3.	a)	Provide two programming examples in which multithreading does *not* provide better performance than a single-threaded solution.	7M	CO2	L5
	b)	Discuss in detail threading Issues?	7M	CO2	L2

OR

4.	a)	Identify the Importance of Atomic transactions in executing critical sections?	7M	CO2	L3
	b)	Show that the two-phase locking protocol ensures conflict serializability?	7M	CO2	L4

UNIT–III

5.	a)	Explain different Contiguous Memory allocation strategies with a neat diagram?	7M	CO3	L2
	b)	Describe the parameters to be considered for evaluating a memory management strategy?	7M	CO3	L4

OR

6.	a)	What is the optimistic assumption made in the deadlock-detection algorithm? How can this assumption be violated?	6M	CO3	L4
	b)	Explain the use of a resource allocation graph in detecting deadlocks with a suitable example?	8M	CO3	L3

UNIT–IV

7.	a)	What are points to be considered in file system design? Explain the following file allocation methods (i) Contiguous allocation (ii) i-node.	8M	CO4	L2
	b)	Why must the bit map for file allocation be kept on mass storage, rather than in main memory?	6M	CO4	L2

OR

8.	a)	What is Mounting? Describe file system mounting with a neat diagram?	7M	CO4	L3
	b)	What is Directory? List and explain Directory implementation methods with a neat diagram?	7M	CO4	L2

UNIT–V

9.	a)	Discuss the strengths and weaknesses of implementing an access matrix using access lists that are associated with objects?	7M	CO5	L2
	b)	Write a short note on the Revocation of access rights?	7M	CO5	L1

OR

10.	a)	How are the access-matrix facility and the role-based access-control facility similar? How do they differ?	7M	CO5	L4
	b)	Explain about domains of protection?	7M	CO5	L3

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II B.Tech. II Semester Supplementary Examinations April 2023
Probability and Statistics
(Common to CE , ME and CSE)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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Marks

UNIT–I

1. a) A card is drawn from a pack of 52 cards. Find the probability of getting a king or a heart or a red card.   6M

   b) A University bought 45% , 25% and 30% of computers from HCL, WIPRO and IBM respectively and 2%, 3% and 1% of these were found to be defective. Find the probability of a computer selected at random is found to be defective?   8M

OR

2. a) Define the following (i) Sample Space (ii) event (iii) Outcome (iv) Probability   8M

   b) If two dice are throw , Find the probability of getting a sum is10   6M

UNIT–II

3. a) The weekly wages of 1000 workmen are normally distributed around a mean of Rs.70 with a standard deviation of Rs.5. Estimate the number of workers whose weekly wages will be (i) Between Rs.69 and Rs.72 (ii) Less than Rs.69 (iii)More than Rs.72.   7M

   b) Out of 800 families with 5 children each, how many would you expect to have (i) 3 boys (ii) 5 girls (iii) either 2 or 3 boys? Assume equal probabilities for boys and girls.   7M

OR

4. a) A random variable x has the following probability function values of x.

x	-2	-1	0	1	2	3
P(x)	0.1	K	0.2	2k	0.3	k

   Find the values K, $P(X \geq -1), P(X \leq 2)$ 7M

   b) Fit a poisson distribution to the frequency distribution

x	0	1	2	3	4
f	46	38	22	9	1

      7M

UNIT–III

5. a) A population consists of 5, 10, 14, 18, 13, 24. Consider all possible samples of size 2 which can be drawn without replacement from this population. Find the population mean and standard deviation, and mean and standard deviation of the sampling distribution of means.   7M

   b) Find 95% confidence limits for the mean of a normality distributed population from which the following sample was taken 15,17,10,18,16,9,7,11,13,14.   7M

OR

6. a) A random sample of size 81 was taken whose variance is 20.25 and mean is 32. Construct 98% confidence interval.   7M

   b) A random sample size 100 is taken from a population with $† = 5.1$. Given that the sample mean $\overline{x} = 21.6$. Construct a 95%confidence interval for population mean.   7M

UNIT–IV

7. To examine the hypothesis that the husbands are more intelligent that the wives an investigator took a sample of 10 couples and administered them a test which measures the I.Q. The results are as follows

Husbands	117	105	97	105	123	109	86	78	103	107
Wives	106	98	87	104	116	95	90	69	108	85

Test the hypothesis with a reasonable test at the level of significance of 0.05. 14M

OR

8. a) In a sample of 1000 people in Karnataka, 540 are rice eaters and the rest are wheat eaters can we assume that both rice and wheat are equally popular in this state at 1% of level of significance. 7M

   b) Tests performed with a random sample of 40 engineers produced by a large manufacture. Show that they have a mean thermal effect of 31.45% with a standard deviation 1.6% at 0.01level of significance. Test the null hypothesis $\sim = 32.3\%$, against the alternative hypothesis $\sim \neq 32.3\%$. 7M

UNIT–V

9. a) The time taken by workers in performing a job by method I and method II is given below

Method I	20	16	26	27	23	22	-
Method II	27	33	42	35	32	34	38

   Do the data show that the variances of time distribution from population from which these samples are drawn do not differ significantly? 7M

   b) The following table gives the classification of 100workers according to sex and nature of work. Test whether the nature of work is independent of the sex of the worker.

	Stable	Unstable	Total
Males	40	20	60
Females	10	30	40
Total	50	50	100

7M

OR

10. The measurements of the output of two units have given the following results. Assuming that both samples have been obtained from the normal populations at 10% significant level, Test whether the two populations have the same variance

Unit-A	14.1	10.1	14.7	13.7	14.0
Unit-B	14.0	14.5	13.7	12.7	14.1

14M

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R-19

Code: 7G142

II B.Tech. II Semester Supplementary Examinations April 2023
Design and Analysis of Algorithms
(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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			Marks	CO	BL
		UNIT–I			
1.	a)	Write an algorithm for finding n natural numbers	7M	CO1	1
	b)	Explain the algorithm for Fibonacci sequence of n numbers	7M	CO1	2
		OR			
2.	a)	Compare and contrast between iterative and recursive process	7M	CO1	5
	b)	How do we analyze algorithms? Explain	7M	CO1	5
		UNIT–II			
3.		Explain about prims algorithm with an example	14M	CO2	2
		OR			
4.	a)	What are the applications of greedy method	7M	CO2	2
	b)	Explain the general method of greedy method	7M	CO2	2
		UNIT–III			
5.	a)	What does dynamic programming have in common with divide and conquer	7M	CO3	4
	b)	Explain the applications of dynamic programming	7M	CO3	2
		OR			
6.		Explain about Travelling sales person problem using dynamic programming	14M	CO3	2
		UNIT–IV			
7.	a)	Write in detail 8 queens problem	7M	CO4	4
	b)	Explain the control abstraction for back tracking method	7M	CO4	2
		OR			
8.	a)	Explain properties of LC search	7M	CO4	2
	b)	Write the control abstraction of LC branch and bound method	7M	CO4	4
		UNIT–V			
9.	a)	Explain in detail the classes of P and NP with examples	7M	CO5	2
	b)	Explain the strategy to prove that a problem is NP hard in detail	7M	CO5	2
		OR			
10.		State and Explain COOKS theorem in detail	14M	CO5	1,2

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R-17

Code: 7G143

II B.Tech. II Semester Supplementary Examinations April 2023
Formal Languages and Automata Theory
(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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	Marks	CO	BL

UNIT–I

1. a) Define Alphabets, Strings and Languages with examples? — 6M CO1 L1

   b) Construct DFA equivalent to the following NFA. Show the acceptance of the string 00011 on both the Fas. Assume that q0 is the start state and q3 is final state?

	0	1
q0	{q0,q1}	{q0}
q1	-	{q2}
q2	-	{q3}
q3	-	-

   10M CO1 L5

OR

2. a) Compare and contrast Moore Machine with Melay Machine? — 5M CO1 L5

   b) Design a DFA that accepts the language over the alphabet, = {0, 1, 2} where the decimal equivalent of the language is divisible by 3**?** — 9M CO1 L6

UNIT–II

3. a) Explain the closure properties of regular languages? — 6M CO2 L2

   b) Construct a Finite Automata for the regular expression?
      (0+1)(1+10)* — 8M CO2 L5

OR

4. a) Define a Regular expression. Find regular expressions for the following languages over the alphabet {a, b**}.**
      i. All strings of odd length
      ii. All strings that end with either ab or b — L1
      iii. All strings that contain even number of a's — 8M CO2 L5

   b) Show that the Language L = $\{a^{i^2} / i \geq 1\}$ is not regular? — 6M CO2 L6

UNIT–III

5. a) List the closure properties of Context Free Languages? — 6M CO3 L1

b) Explain minimization of CFG with the following example?

     S   aA | aBB

     A   aAA |

     B   bB | bbC

     C   B   8M CO3 L2

OR

6. a) Construct a FA recognizing the following regular grammar?

     S   aS/bA/b

     A   aA/bS/a   6M CO3 L5

    b) Convert the given CFG to CNF?

     S   aAs/ a

     A SbA/SS/ba   8M CO3 L6

UNIT–IV

7. a) Write and explain about Push Down Automata?   4M CO4 L1

    b) Construct a PDA that accepts the language L={wcw^R/w $\in$ {a, b}}?   10M CO4 L5

OR

8. a) Describe equivalence of CFL and PDA with appropriate example?   6M CO4 L2

    b) Design PDA to accept the following CFG?

     S   AA/a

     A   SA/b   8M CO4 L6

UNIT–V

9. a) Write short notes on Liner Bounded Automaton?   4M CO5 L4

    b) Design Turing's Machine to accept the language L={a^n b^n c^n / n 1}. Also give the graphical representation and Instantaneous description (ID) for the import "aabbcc"?   10M CO5 L6

OR

10. a) Write and explain about Counter machines?   6M CO5 L2

   b) Design a TM for L = {0^{n}1^n | n 1}   8M CO5 L6

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