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<b>R-15</b>
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**Code: 5G144**

II B.Tech. II Semester Supplementary Examinations December 2022

**Object Oriented Programming**

(Common to CSE & IT)

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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**UNIT-I**

	Marks	CO	BL
1. Explain different types of control statements available in Java with examples.	14M	1	2

**OR**

2. a) List and explain the java buzz words.	8M	1	1,2
b) Explain the importance of byte code in java programming	6M	1	2

**UNIT-II**

3. a) Explain abstract classes with an example. Compare final and abstract modifiers	7M	2	3
b) Illustrate the use of “this” keyword with an example.	7M	2	3

**OR**

4. Explain the process of creating and accessing packages with suitable example programs.	14M	2	3
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**UNIT-III**

5. a) What is the difference between checked and unchecked exception? Write the code segments for each type.	7M	3	3
b) Explain “throw” and “throws” keywords in Java	7M	3	2

**OR**

6. a) Explain Thread life cycle.	7M	3	2
b) Illustrate user defined exceptions with an example.	7M	3	3

**UNIT-IV**

7. a) List the collection interfaces. Describe List interface.	7M	4	3
b) Explain applet life cycle with suitable program.	7M	4	2

**OR**

8. a) What is the need of SortedSet interface? Explain.	10M	4	3
b) Briefly explain about card layout.	4M	4	2

**UNIT-V**

9. a) Explain the JApplet, JFrame and JComponent.	9M	5	2
b) Describe InetAddress in networking.	5M	5	3

**OR**

10. a) Explain about inner classes.	6M	5	2
b) Explain in detail about Buttons in “javax.swing” package.	8M	5	3

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Hall Ticket Number :									
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<b>R-15</b>
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**Code: 5GC42**

II B.Tech. II Semester Supplementary Examinations December 2022

**Probability & Statistics**

(Common to CE, ME & 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    CO    BL

**UNIT-I**

1. If  $P(A) = 1/4$ ,  $P(B) = 1/3$  and  $P(A \cup B) = 1/2$  then find  $P(A/B)$ ,  $P(B/A)$ ,  $P(A \cap B')$  and  $P(A/B')$ . 14M    1    L2

**OR**

2. State and prove Baye's theorem 14M    1    L2

**UNIT-II**

3. Ten coins are throw simultaneously. Find the probability of getting at least (i) seven heads (ii) six heads 14M    2    L1

**OR**

4. If the probability of a bad reaction from a certain injection is 0.001, determine the chance that out of 2000 individuals more than two individuals will get a bad reaction. 14M    2    L4

**UNIT-III**

5. If we can assert with 95% that the maximum error is 0.05 and P is 0.2. Find the size of the sample. 14M    3    L2

**OR**

6. 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. 14M    3    L2

**UNIT-IV**

7. A random sample of 10 boys had the following I.Qs: 70, 120, 110, 101, 88, 83, 95, 98, 107, and 100. Do these data support the assumption of population mean I.Q of 100? 14M    4    L4

**OR**

8. A random sample of 100 recorded deaths in a country showed an average life span of 71.8 years. Assuming a population standard deviation of 8.9 years, does this seem to indicate that the mean life span today is greater than 70 years? Use a 0.05 level of significance. 14M    4    L4

**UNIT-V**

9. 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    4    L4

**OR**

10. 4 coins were tossed 160 times and the following results were obtained,

No, of Heads	0	1	2	3	4
Frequency	17	52	54	31	6

Under the assumption that coins are unbiased, find the expected frequencies of 0,1,2,3,4 heads and test the goodness of fit for  $\alpha = 0.05$

14M    4    L4

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**R-15**

**Code: 5G142**

II B.Tech. II Semester Supplementary Examinations December 2022

**Design and Analysis of Algorithms**

(Common to CSE & IT)

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	Blooms Level
<b>UNIT-I</b>			
1. a) Write performance analysis of an algorithm	7M	CO1	L2
b) Explain the differences between an algorithm and pseudocode	7M	CO1	L2
<b>OR</b>			
2. a) How to validate an algorithm. Explain	7M	CO1	L5
b) How to design an algorithm. Explain	7M	CO1	L5
<b>UNIT-II</b>			
3. a) Explain the average case analysis of Quick sort in detail	10M	CO2	L2
b) Write the best case analysis of quick sort	4M	CO2	L2
<b>OR</b>			
4. a) Explain the differences between divide and conquer and greedy method	7M	CO2	L2
b) What are the applications of divide and conquer	7M	CO2	L4
<b>UNIT-III</b>			
5. a) Explain the features of dynamic programming	7M	CO3	L2
b) Show the general procedure of dynamic programming	7M	CO3	L4
<b>OR</b>			
6. a) Write the general method of dynamic programming	7M	CO3	L2
b) Explain in detail Matrix chain multiplication	7M	CO3	L2
<b>UNIT-IV</b>			
7. a) List the advantages of backtracking method	7M	CO4	L1
b) Write the general method of back tracking	7M	CO4	L4
<b>OR</b>			
8. Write in detail Travelling sales person problem and discuss how to solve it by using branch and bound method	14M	CO4	L4
<b>UNIT-V</b>			
9. a) How are P and NP problems related	7M	CO5	L4
b) Compare NP hard and NP Completeness	7M	CO5	L4
<b>OR</b>			
10. a) Briefly explain the classes NP hard and NP complete	7M	CO5	L2
b) Explain the satisfiability problem	7M	CO5	L2

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**Code: 5G143**

II B.Tech. II Semester Supplementary Examinations December 2022

**Formal Languages and Automata Theory**

(Computer Science and Engineering)

Max. Marks: 70

Time: 3 Hours

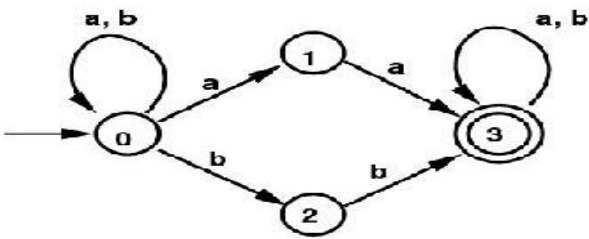
Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

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Marks      CO      Blooms Level

**UNIT-I**

1. a) Categorize the different types of languages in automata theory? 4M
- b) Let M be the NFA shown in Figure. Construct Equivalent DFA for the given NFA? 10M

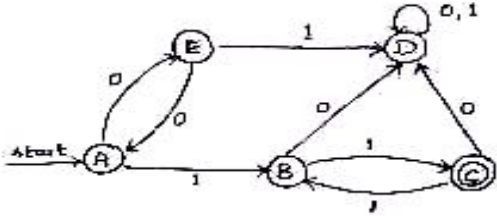


**OR**

2. a) Construct a Moore machine to determine the residue mod 3 for each binary string treated as a binary integer. Convert the resultant to Mealy machine? 10M
- b) What are the difference between NFA and DFA? 4M

**UNIT-II**

3. a) List and explain any six identity rules of the Regular expressions? 6M
- b) Convert the following automation to a Regular Expression? 8M

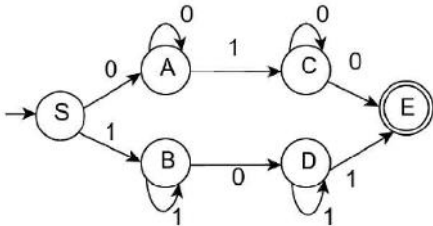


**OR**

4. a) What is pumping lemma? Write the applications of Pumping Lemma? 4M
- b) Construct NFA for the regular expression:  
 $10+(0+11)0^*1$  10M

**UNIT-III**

5. a) Differentiate Leftmost Derivation and Rightmost Derivation with an example? 4M
- b) Find Right Linear Grammar for the following FA? 10M



**OR**

10M      3      L3

6. a) Give the CFG for “The set of all strings of balanced parenthesis”? 6M 3 L3  
 b) Convert the following grammar into CNF?  
     S aAD  
     A aB/bAB  
     B b  
     D d. 8M 3 L6
- UNIT-IV**
7. a) Write a short note on DPDA and DCFL? 4M 4 L3  
 b) Construct the equivalent PDA for the following CFG?  
     S 0A  
     A 0AB/1  
     B 1 10M 4 L5
- OR**
8. a) Differentiate PDA by empty stack and final state by giving their definitions? 4M 4 L5  
 b) Construct a PDA that accepts the language  $L = \{ww^R/w \in \{a, b\}^*\}$ ? 10M 4 L5
- UNIT-V**
9. a) Explain church’s hypothesis? 4M 5 L2  
 b) Explain with a neat diagram, the working of a Turing Machine model? 10M 5 L2
- OR**
10. a) What is Undecidability? Explain about PCP and modified PCP? 4M 5 L2  
 b) Design a Turing machine which multiplies two integers? 10M 5 L6

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