II B.Tech. II Semester Supplementary Examinations February 2022
Object Oriented Programming
(Common to CSE & IT)

Max. Marks: 70   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)
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UNIT–I

1. a) Explain relational operators in java.   5M
   b) Java does not support goto statement. Why?   4M
   c) Explain garbage collection in Java.   5M

OR

2. a) Explain the OOPs concepts: Encapsulation, Polymorphism and Abstraction   7M
   b) Explain the java buzz words.   7M

UNIT–II

3. a) Explain method overriding with an example.   7M
   b) Explain the different levels of access protection in java.   7M

OR

4. a) Explain the difference between class and interface with an example each. 7M
   b) Explain in detail the process of creating, defining, importing and accessing a
      package with suitable examples   7M

UNIT–III

5. a) Explain the creation and usage of exception with an example.   7M
   b) Explain thread synchronization with an example.   7M

OR

6. a) Explain about different types of exceptions in JAVA.   7M
   b) Explain the creation of thread using Runnable interface and Thread class
      with an example.   7M

UNIT–IV

7. Explain in detail any four classes of the java.net package.   14M

OR

8. a) Write the differences between applet and an application program.   7M
   b) Write an applet to display the current date and time.   7M

UNIT–V

9. a) Describe delegation event model   5M
   b) Write the limitations of AWT components   4M
   c) Write a java program to illustrate TextEvent.   5M

OR

10. a) Write a java program to display the month names by JList and display the
       days by JComboBox.   7M
    b) In what way JButton is better than Button class? Explain it with an example. 7M

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II B.Tech. II Semester Supplementary Examinations February 2022
Probability and 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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UNIT–I

1. a) If $P(A) = \frac{1}{4}$, $P(B) = \frac{1}{3}$ and $P(A \cup B) = \frac{1}{2}$ then evaluate $P(A/B)$, $P(B/A)$, $P(A \cap B')$ and $P(A/B')$ 8M

   b) State and prove Addition theorem on probability for three events.   6M

OR

2. a) State and prove Baye's theorem.   8M

   b) A card is drawn from a well shuffled deck of 52 playing cards. What is the probability of drawing a red king (ii) 3, 4, 5 or 6 (iii) black card.   6M

UNIT–II

3. a) Find the continuous probability function f(x)=k x² e⁻ˣ when x 0 find (i) k (ii) mean (iii) variance   7M

   b) A hospital switch board receives an average of 4 emergency calls in a 10 minute interval. What is the probability that
   (i) There are at most 2 emergency calls in a 10 minute interval
   (ii) There are exactly 3 emergency calls in a 10 minute interval   7M

OR

4. a) If a random variable has a poisson distribution such that P (1) = P(2) find
   (i) Mean of the distribution,(ii) P(4),(iii) P(x 1),(iv) P(1<x<4)   7M

   b) In a normal distribution, 7% are under 35 and 89% are under 63. Find the mean and the standard deviation of the distribution.   7M

UNIT–III

5. A random sample of size 81 taken whose variance is 20.25 and mean is 32, construct 98% confidence interval   14M

OR

6. A population consists of the five numbers 2, 3, 6, 8, 11. Consider all possible samples of size 2 which can be drawn with replacement from this population. Find the population mean and standard deviation, and mean and standard deviation of the sampling distribution of means.   14M

UNIT–IV

7. An ambulance services claims that it takes on the average less than 10min to reach its destination in emergency calls. A sample of 36 calls has a mean of 11 min and the variance of 16 min. test the significance 0.05 level.   14M

OR

8. A die is thrown 9000 times and of these 3220 yielded a die is thrown 9000 times and of these 3220 yielded a or 4. i.e., this is consistence with the hypothesis is that die was unbiased.   14M

UNIT–V

9. The number of automobile accidents per week in a certain community are as follows 12, 8, 20, 2, 14, 10, 15, 6, 9, and 4. Are these frequencies in agreement with the belief that accident conditions were the same during this 10 week period   14M

OR

10. 200 digits were choose at random from a set of tables. The frequencies of the digits are shown below

Digit	0	1	2	3	4	5	6	7	8	9
Frequency	18	19	23	21	16	25	22	20	21	15

Use the chi-square test to assess the correctness of the hypothesis that the digits were distributed in equal number in the tables from which these were chosen.   14M

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Code: 5G143

II B.Tech. II Semester Supplementary Examinations February 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. Consider the following $\in$ -NFA

	$\in$	a	b	c
p	ø	{p}	{q}	{r}
q	{p}	{q}	{r}	ø
(r)	{q}	{r}	ø	{p}

   i. Compute the $\in$ - closure of each state

   ii. Convert the automation to a DFA.   14M   CO1   L1,L2

OR

2. Construct the Minimized DFA for the given below DFA.

Fig : DFA   14M   CO1   L1,L2

UNIT–II

3. Construct DFA for the Regular expression $(0+1)^* (00+11)(0+1)^*$ 14M   CO2   L2,L3

OR

4. a) Show that $L = \{a^n b^n c^n / n > 0\}$ is not regular using pumping
       lemma   8M   CO2   L2,L3

    b) Illustrate the closure properties of Regular Sets   6M   CO2   L2,L3

UNIT–III

5. Construct regular grammar for given DFA.

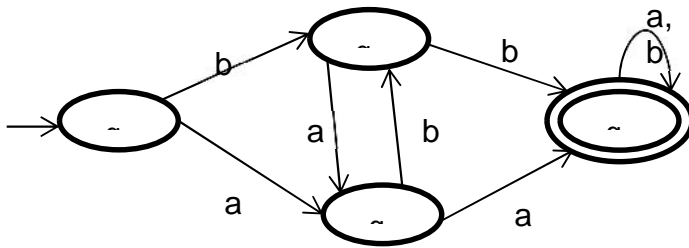**Fig : DFA**

14M CO3 L4

OR

6. Convert the following CFG into CNF.

S   aA | a | Bb |cC
A   aB | ϵ
B   a | Aa
C   cCD
D   ddd

14M CO3 L4

UNIT–IV

7. Obtain a PDA to accept the language L (M) = {w | wϵ (a+b)* and n_a (w) = n_b (w)}.

14M CO4 L3

OR

8. Construct CFG for the PDA M = ({q_0, q_1}, {0, 1}, {R, Z_0},   , q_0, Z_0,) and   is given below:

(q_0, 1, Z_0)= (q_0, RZ_0)
(q_0, 1, R)= (q_0, RR)
(q_0, 0, R)= (q_1, R)
(q_1, 0, Z_0)= (q_0, Z_0)
(q_0, \epsilon, Z0)= (q_0, \epsilon)
(q_1, 1, R)= (q_1, \epsilon)

14M CO4 L3

UNIT–V

9. Design a TM for L = {$0^n 1^n$ | n 1}

14M CO5 L3

OR

10. a) Explain church's hypotheses briefly.

6M CO5 L3

b) Describe in detail about Turing reducibility and Halting Problem.

8M CO5 L3

END