

Hall Ticket Number :

R-11 / R-13

Code: 1G143

II B.Tech. II Semester Supplementary Examinations May 2018

Design and Analysis of Algorithms

(Common to CSE & IT)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks each**)

1. a) Elaborate on asymptotic notations with examples. 7M
b) What is weighting rule? Discuss about the union algorithm using weighting rule. 7M
2. a) Write the pseudo code for finding the position of the largest element in the given array of N numbers using divide and conquer. 7M
b) Explain merge sort problem using divide and conquer 7M
3. a) Demonstrate with an example Prim's and Kruskal's algorithm 7M
b) Demonstrate with an example how to solve the given knapsack problem using Greedy technique. $n = 3$ $m = 20$ $(p_1, p_2, p_3) = (25, 24, 15)$ $(w_1, w_2, w_3) = (18, 15, 10)$ 7M
4. a) Dynamic programming is best compared to the greedy method. Justify the statement. Explain all pairs shortest path problem. 7M
b) Explain how travelling person problem could be solved using dynamic programming method. Explain with sample graph. 7M
5. a) Write the control abstraction for backtracking method. How the 8 queens' problem could be solved using backtracking method? Discuss. 7M
b) Let $S = \{5, 7, 10, 12, 15, 18, 20\}$ and $m=35$. Find all the possible subsets of S whose sum is equivalent to m . Draw the portion of state space tree for this problem. 7M
6. a) Give an algorithm to identify articulation points and to construct biconnected components. Explain with an example. 7M
b) Explain in detail DFS graph traversal. 7M
7. a) Explain with an algorithm as to how 0/1 knapsack problem is solved using branch and bound technique. 7M
b) Compare and contrast LC-BB and FIFO BB 7M
8. a) Write and explain Cook's theorem. 7M
b) Explain in detail NP hard problems. 7M

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II B.Tech. II Semester Supplementary Examinations May 2018

Object Oriented Programming through Java

(Common to CSE & IT)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

1. a) Explain about type conversion and casting in java
b) Write a program to illustrate the usage of the following methods of the following methods of StringBuffer class.
setCharAt(), append(), getChars()
2. a) Define inheritance. Explain about the forms of inheritance.
b) Explain about abstract class with an example program.
3. a) How can we achieve multiple inheritances in java? Write example program.
b) Explain the importance of final in java programming.
4. a) Distinguish between classes and interface.
b) Why we need to set the CLASSPATH? Explain.
5. a) What is an exception? Distinguish between built – in and user – defined exceptions.
b) Discuss about the thread priorities.
6. a) What is applet? Explain life cycle of an applet.
b) Explain boarder and grid layout manager types with the help of example programs.
7. Explain the steps involved in creating JCheckBox, JRadioButton, JButton, JLabel.
8. Write short notes on the following:
(a) Datagrams.
(b) URL connection.
(c) Java.net package.

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R-11/R-13**Code: 1GC42**

II B.Tech. II Semester Supplementary Examinations May 2018

Probability and Statistics

(Common to CE, ME & IT)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questionsAll Questions carry equal Marks (**14 Marks** each)

1. a) Calculate the mean and standard deviation for the following

Size of item:	6	7	8	9	10	11	12
Frequency:	3	6	9	13	8	5	4

7M

- b) Find the Correlation Coefficient between industrial production and export using the following data and comment on the result.

Production (in crore tons)	55	56	58	59	60	60	62
Export (in crore tons)	35	38	38	39	44	43	45

7M

2. a) Two cards are drawn at random from an ordinary deck of 52 playing cards. What is the probability of getting two aces if

- i) The first card is replaced before the second card is drawn;
 ii) The first card is not replaced before the second card is drawn?

6M

- b) State and Prove Baye's theorem.

8M

3. a) A discrete random variable X has the following probability distribution given below:

Value of X	0	1	2	3	4	5	6	7
$P(X = x)$	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2 + k$

- (i) Find the value of 'k'. (ii) Find
- $P(X < 6)$
- ,
- $P(0 < X < 4)$
- and
- $P(X \geq 6)$
- .

7M

- b) Find the value of
- k
- and the distribution function
- $F(x)$
- given the probability density function of a random variable X as:
- $f(x) = \frac{k}{x^2 + 1}$
- ,
- $-\infty < x < \infty$
- .

7M

4. a) Find the mean and variance for the Poisson distribution.

7M

- b) An aptitude test for selecting offers in a bank is conducted on 1000 candidates. The average score is 42 and the standard deviation of score is 24. Assuming normal distribution for the scores, find

- (i) The number of candidates whose scores exceed 60;
 (ii) The number of candidates whose scores lie between 30 and 60.

7M

5. A population consists of five numbers 2, 3, 6, 8 and 11. Consider all possible samples of size 2 that can be drawn with replacement from this population. Find

- a) The mean of the population.
 b) The standard deviation of the population.
 c) The mean of the sampling distribution of means and
 d) The standard deviation of the sampling distribution of means

14M

6. a) Explain the following:
- Point estimation
 - Interval estimation
- b) Determine a 95% confidence interval for the mean of a normal distribution with variance $\sigma^2 = 0.25$, using a sample of $n = 100$ values with mean $\bar{x} = 212.3$.

8M

6M

7. a) Two samples of sodium vapor bulbs were tested for length of life and the following results were returned :

	Size	Sample mean	Sample S.D.
Type I	8	1234 hrs	36 hrs
Type II	7	1036 hrs	40 hrs

Is the difference in the means significant to generalize that type I is superior to type II regarding length of life? Use a 0.05 level of significance.

7M

- b) In a random sample of 100 tube lights produced by company A, the mean life time of tube light is 1190 hours with standard deviation of 90 hours. Also in a random sample of 75 tube lights from company B the mean life time is 1230 hours with standard deviation of 120 hours. Is there a difference between the mean lifetimes of the two brands of tube lights at a significance level of 0.05?
8. a) Transceivers provide wireless communication among electronic components of consumer products. Responding to a need for a fast, low-cost test of Bluetooth-capable transceivers, engineers developed a product test at the water level. In one set of trails with 60 devices selected from different wafer lots, 48 devices passed. Test the null hypothesis $p = 0.70$ against the alternative hypothesis $p > 0.70$ at the 0.95 level of significance.

7M

6M

- b) To determine whether there really is a relationship between an employee's performances in the company's training program and his or her ultimate success in the job, the company takes a sample of 400 cases from its very extensive files and obtains the results shown in the following table:

Performance in training program					
		Below Average	Average	Above Average	Total
Success in job (employer's rating)	Poor	23	60	29	112
	Average	28	79	60	167
	Very good	9	49	63	121
	Total	60	188	152	400

Use the 0.01 level of significance to test the null hypothesis that performance in the training program and success in the job are independent.

8M
