R-11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)

II B.Tech. II Semester Supplementary Examinations Jan/Feb 2014

Database Management Systems
(Common to CSE & IT)

Max. Marks: 70   **Time: 03 Hours**

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Answer *any five* questions
All Questions carry equal marks (14 Marks each)

1. a) What are the types of languages a database system provides? Explain.   7M

   b) Give short notes on Transaction management.   7M

2. a) Draw An E-R Diagram motor-vehicle sales company and Design a generalization–specialization hierarchy for a motor-vehicle sales company.   7M

   b) Explain the conceptual design of ER model.   7M

3. a) What is a foreign key constraint? Why are such constraints important? What is referential integrity?   7M

   b) How can we translate an ER –diagram in to SQL statement to create tables .How are constraints in the ER model, weak entity sets, class hierarchies and aggregation handled.   7M

4. a) Explain SQL join operators.   7M

   b) Discuss about aggregation functions with examples.   7M

5. a) What is normalization? Discuss first, second and third normal forms with examples.   7M

   b) Explain the need of Schema refinement in detail.   7M

6. a) What are the ACID properties? Illustrate them through examples.   7M

   b) Define the terms Transaction, Schedule, Serializable Schedule, recoverable Schedule, Strict Schedule with suitable examples   7M

7. a) Explain Dead lock Prevention Policies employed in databases.   7M

   b) Discuss in detail about log based recovery.   7M

8. a) Explain Clustered index organization with an example   7M

   b) What is the order of a B+ Tree? Describe the format of nodes in a B+ Tree. Why are the nodes at the leaf level linked?   7M

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Code : *1G143*

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
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II B.Tech. II Semester Supplementary Examinations Jan/Feb 2014

Design and Analysis of Algorithms
(*Common to CSE & IT*)

Max. Marks: 70   Time: 03 Hours

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Answer *any five* questions
All Questions carry equal marks (14 Marks each)

1. a) Write the non-recursive algorithm for finding the Nth Fibonacci number and derive it's time complexity.   7M

   b) Explain in detail about various asymptotic notations used for expressing the time complexity of an algorithm.   7M

2. Write an algorithm to sort N numbers in descending order using quick sort. Trace the algorithm with the numbers 56, 79,3, 6, 83, 8. Also analyze the time complexity.   14M

3. Explain the general method of greedy strategy. Explain how the single source shortest path can be computed by taking a weighted graph, using greedy method. Write the algorithm and derive the time complexity.   14M

4. a) Explain matrix chain multiplication with an example.   7M

   b) Solve the following 0/1 Knapsack problem using dynamic programming
   P =(11,21,31,33), W=(2,11,22,15), C=40, n=4.   7M

5. What is backtracking? Explain how the sum of subsets problem can be solved using backtracking, with an example. Write the algorithm and derive the time complexity.   14M

6. What are bi-connected components of a given graph? Give an example graph and it's corresponding bi-connected components. Write an algorithm to find out the bi-connected components of given graph and derive it's time complexity.   14M

7. Explain in detail how you solve the travelling salesperson problem using LC Branch and Bound method. Write the algorithm, derive it's complexity and trace it for the graph with the following cost matrix. Assume that the source is the first vertex.

$$\begin{pmatrix} \infty & 20 & 30 & 10 & 11 \\ 15 & \infty & 16 & 4 & 2 \\ 3 & 5 & \infty & 2 & 4 \\ 19 & 6 & 18 & \infty & 3 \\ 16 & 4 & 7 & 16 & \infty \end{pmatrix}$$ 14M

8. Explain in detail about the cooks theorem.   14

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Code : 1G145

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
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II B.Tech. II Semester Supplementary Examinations Jan/Feb 2014

Object Oriented Programming through JAVA
(Common to CSE & IT)

Max. Marks: 70   Time: 03 Hours

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Answer *any five* questions
All Questions carry equal marks (14 Marks each)

1. a)	Explain the various OOP paradigms for an example of sending flowers to your friend via a florist.	7M
b)	Write a java program to reverse the given number '0123456789'	7M
2. a)	Explain with an example when 'a superclass variable can reference a subclass object'.	7M
b)	Explain how multiple inheritance is achieved in java with a suitable example	7M
3.	Define an interface. How is it different from abstract class? Describe the various ways in which interfaces can be implemented.	14M
4.	Explain the following exceptions with suitable example for each a) Arithmetic exception b) NullPointer exception c) FileNotFound exception	14M
5.	Explain each of the methods of KeyListener and MouseListener	14M
6.	Explain the steps in creating a subclass of frame with the help of examples.	14M
7.	Describe the functionality of JComponent with example. Differentiate JComponent and JPanel.	14M
8.	Write a program to demonstrate multiple client chat in java	14M

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Code : *1GC42*

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
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II B.Tech. II Semester Supplementary Examinations Jan/Feb 2014

Probability & Statistics
(Common to ME & IT)

Max. Marks: 70   Time: 03 Hours

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Answer *any five* questions
All Questions carry equal marks (14 Marks each)

1. a) calculate the coefficient of correlation for ranks from the following data
   (x, y)-(5,8) (10,3) (6,2) (3,9) (19,12) (5,3) (6,17)(12,18) (8,22) (2,12) (10, 17) (19, 20)   7M

   b) Calculate the mean and standard deviation for the following table, given age distribution of 542 members

Age in years	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No.of members	3	61	132	153	140	51	2

   7M

2. a) Two cards are selected at random from 10 cards numbered 1 to 10 Find the probability that the sum is even if

   (i) The two cards are drawn together

   (ii) The two cards are drawn one after the other with replacement.   7M

   b) In a bolt factory, machines A, B and C manufacture respectively 25%, 35% and 40% of the total. If their output 5, 4 and 2 percent are defective bolts. A bolt is drown at random from the product and is found to be defective. What is the probability that it was manufactured by machine B?   7M

3. a) If $f(x) = K\,e^{-|x|}$ is probability density function $-\infty < x < \infty$ find the value of K, find the variance of the random variable and also find probability between 0 and 4.   7M

   b) A random variable X has the following probability function

X	-3	-2	-1	0	1	2	3
P(x)	K	.1	K	.2	2k	.4	2k

   Find mean and variance.   7M

4. a) If X is the Poisson variate such that $P(x=0) = P(x=1)$ find $P(x=0)$ and using the recurrence formula find the probability at x = 1,2,3,4 and 5.   7M

   b) In a normal distribution, 31% of the items are under 45 and 8% are over 64. Find the mean and standard deviation of the distribution.   7M

5. Find the mean and standard deviation of the sampling distribution of the variances for the population 2,3,4,5 by drawing samples of size two

(a) with replacement   (b) without replacement (sampling distribution of variances)   14M

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

   b) To estimate the average time it takes to assemble a certain computer component, the individual engineer at an electronics firm timed 40 technicians in the performance of the task, getting mean of 12.73 minutes and a standard deviation of 2.06 minutes.

      i)   What can we say with 99% confidence about the maximum error if $\bar{x} = 12.73$

      ii) Is used as point estimate of the actual average time required to do the job.

      iii) Use the given data to construct a 99% confidence interval.   7M

7. a) An ambulance service claims takes on the average less than 10 minutes To reach its destination in emergency calls. A sample of 36 calls has a mean of 11 minutes and the variance of 16 minutes. Test the significance at 0.05 level?   7M

   b) A study shows that 16 of 200 tractors produced on one assembly line required extensive adjustments before they could be shipped, while the same was true for 14 of 400 tractors produced on another assembly line. At the .01 level of significance, does this support the claim that the second production line does superior work?   7M

8. a) Four methods are under development for making discs of super conducting material. Fifty discs are made by each method and they are checked for superconductivity when closed with liquid

	First method	Second method	Third method	Fourth method
Super conductor	31	42	22	25
Failures	19	8	28	25

Test the significant difference between the proportions of conductors at 0.05 level.   14M

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