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R-15

Code: 5G142

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

Design and Analysis of Algorithms
(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)

UNIT-I

1. Explain various asymptotic notation with the help of examples for the analysis of algorithm. 14M

OR

2. a) Give the algorithm for transpose of a matrix $m \times n$ and determine the time complexity of the algorithm by frequency – count method. 8M

b) Discuss the Amortized analysis with an example. 6M

UNIT-II

3. a) Develop pseudo code to find the minimum and maximum element using divide and conquer algorithm. 6M

b) Explain the merge sort with suitable example. Analyse the best, average, and worst case time complexity of the algorithm. 8M

OR

4. State the Job – Sequencing with deadlines problem. Find an optimal sequence to the $n=5$ Jobs where profits $(P1,P2,P3,P4,P5) = (20,15,10,5,1)$ and deadlines $(d1,d2,d3,d4,d5) = (2,2,1,3,3)$. 14M

UNIT-III

5. Explain multistage graph problem using forward approach with the help of an example. 14M

OR

6. Describe the Dynamic 0/1 Knapsack Problem. Find an optimal solution for the dynamic programming 0/1 knapsack instance for $n=3, m=6$, profits are $(p1, p2,p3) = (1,2,5)$, weights are $(w1,w2,w3)=(2,3,4)$. 14M

UNIT-IV

7. Draw a portion of the state space tree Solve the following 0/1 Knapsack problem using Backtracking $m = 30, n = 4, (w1, w2, w3, w4) = (10, 15, 6, 9)$ and $(p1, p2, p3, p4) = (2, 5, 8, 1)$. 14M

OR

8. Consider the knapsack instance $n=4 ; (p1,p2,p3,p4)=(10,10,12,18) ; (w1,w2,w3,w4)=(2,4,6,9)$ and $m=15$. Draw the state space tree using FIFO Branch and bound. 14M

UNIT-V

9. a) Discuss in detail about NP Complete Problems. 8M

b) Give examples of problems in NP Complete Problems. 6M

OR

10. Discuss the need of approximation algorithms and how they can be used for NP Hard Problems. 14M

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R-15

Code: 5G441

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

Database Management Systems

(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)

UNIT-I

1. a) Explain the responsibilities of Database Administrator. 7M
b) When would you store data in a DBMS instead of in operating system file? 7M

OR

2. a) What is transaction? What guarantees does a DBMS offer w.r.t transactions? 7M
b) Explain the differences between external, internal and conceptual schemas. How are these different schema layers related to the concepts of logical and physical data independence. 7M

UNIT-II

3. a) Construct an E-R diagram for a car insurance company with a set of customers, each of whom owns a number of cars. Each car has a number of recorded accidents associate with it. Determine the entities and relationships that exists between the entities. 8M
b) Define the following terms:
i) Relationship ii) Relationship set iii) Descriptive attribute 6M

OR

4. a) What are integrity constraints? Define the terms primary key constraint and foreign key constraint. How are these constraints expressed in SQL? 6M
b) How can we translate an E-R diagram into SQL statements to create tables? How are entity sets mapped into relations? How are relationship sets mapped? 8M

UNIT-III

5. a) What is a trigger? What re its three parts? What are the differences between row-level and statement-level triggers? 6M
b) Consider the following relations:
Student(snum: integer, sname: string, major: string, level: string, age: integer)
Class(name: string, meets at: string, room: string, fid: integer)
Enrolled(snum: integer, cname: string)
Faculty(fid: integer, fname: string, deptid: integer)
Enrolled has one record per student-class pair such that the student is enrolled in the class.
Write the following queries in SQL.
i. Find the names of all Juniors (level = JR) who are enrolled in a class taught by I. Teach.
ii. Find the age of the oldest student who is either a History major or enrolled in a course taught by I. Teach. 8M

OR

6. a) Explain commit, rollback and savepoint in PL/SQL. 5M
- b) Consider the following schema:
 Suppliers(sid: integer, sname: string, address: string)
 Parts(pid: integer, pname: string, color: string)
 Catalog(sid: integer, pid: integer, cost: real)
- The Catalog relation lists the prices charged for parts by Suppliers. Write the following queries in SQL:
1. Find the pnames of parts for which there is some supplier.
 2. Find the snames of suppliers who supply every part.
 3. Find the snames of suppliers who supply every red part. 9M

UNIT-IV

7. a) Show that if a relation schema is in BCNF, then it is also in 3NF. 7M
- b) Why some functional dependencies are called trivial? 7M

OR

8. a) What is schema refinement? Explain the problems caused by redundancy. 6M
- b) What is functional dependency and multivalued dependency? Explain 4NF with an example. 8M

UNIT-V

9. a) Explain ACID properties. 7M
- b) How are transactions created and terminated in SQL? Explain why savepoints and chained transactions are useful. 7M

OR

10. a) How is data organized in a hash-based index? When would you use a hash-based index? 7M
- b) What are the main differences between ISAM and B+ tree indexes? 7M

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Code: 5G144

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

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)

UNIT-I

1. a) What is the purpose of variable in any programming language? Discuss clearly the scope and life time of variables with respect to Java programming language. 7M
- b) Compare and contrast Procedural Programming with Object Oriented Programming. 7M

OR

2. a) What is recursion? Write a recursive program in Java to find the GCD of given two numbers 7M
- b) Write a short note on the following i. This keyword ii. Garbage Collection 7M

UNIT-II

3. a) What is the difference between an Interface, class and an Abstract Class? 7M
- b) What is inheritance? Discuss Extension and Specification with suitable programming Examples. 7M

OR

4. a) Differentiate between PATH and CLASSPATH in Java. 7M
- b) Explain about final classes, final methods and final variables? 7M

UNIT-III

5. a) Is multithreading suitable for all types of applications. If yes explain any such application. If no, explain any application for which multithreading is not desired. 7M
- b) What is inter thread communication? What methods are employed in inter thread communication? 7M

OR

6. a) List out the various java built-in exception handlers. 7M
- b) Develop a program to illustrate how multithread operation is done? 7M

UNIT-IV

7. a) What is the lifecycle of an applet? Which method is used for setting security in applets? 7M
- b) What are advantages of layout managers? Why java prefers layout manager instead of fixing the components by x and y coordinates? 7M

OR

8. a) What are the four forms of method repaint()? Explain their usage with a sample java program? 7M
- b) Write a java program which draws a dashed line and dotted line using applet. 7M

UNIT-V

9. a) Discuss briefly about the following: TCP, UDP, URL 7M
- b) Differentiate JComponent and JPanel. 7M

OR

10. a) What is InetAddress? How to create an InetAddress? What is its use? 7M
- b) What are the methods supported by KeyListener interface. Explain each of them with examples 7M

Code: 5GC42

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

Probability and Statistics

(Common to CE, ME and IT)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

- 1. a) A box contains n tickets marked 1 through n. Two tickets are drawn in succession without replacement. Determine the probability that the number on the tickets are consecutive integers.

7M
- b) In a factory, machine A produces 40% of the output and machine B produces 60%. On the average, 9 items in 1000 produced by A are defective and 1 item in 250 produced by B is defective. An item drawn at random from a day's output is defective. What is the probability that it was produced by A or B?

7M

OR

- 2. a) A fair coin is tossed until a head or five tails occurs. Find the expected number E of tosses of the coin.

7M
- b) Calculate expectation and variance of X, if the probability distribution of the random variable X is given by

7M

X	-1	0	1	2	3
f	0.3	0.1	0.1	0.3	0.2

UNIT-II

- 3. a) Ten coins are thrown simultaneously. Find the probability of getting at least six heads.

7M
- b) Fit a Poisson distribution to the following data

7M

x	0	1	2	3	4	5	Total
f	142	156	69	27	5	1	400

OR

- 4. a) Find the mean and standard deviation of a normal distribution in which 7% of items are under 35 and 89% are under 63.

7M
- b) A sales tax officer has reported that the average sales of the 500 business that he has to deal with during a year is Rs. 36,000 with a standard deviation of 10,000. Assuming that the sales in these business are normally distributed, find the percentage of business the sales of which are likely to range between Rs. 30,000 and Rs. 40,000.

7M

UNIT-III

- 5. A population consists of six numbers 4, 8, 12, 16, 20, 24. Consider all samples of size two which can be drawn without replacement from this population. Find a) The population mean, b) The population standard deviation, c) The mean of the sampling distribution of means, d) The standard deviation of the sampling distribution of means.

14M

OR

- 6. a) The mean voltage of a battery is 15 and S.D is 0.2. Find the probability that four such batteries connected in series will have a combined voltage of 60.8 or more volts.

7M
- b) A sample of 10 cam shafts intended for use in gasoline engines has an average eccentricity of 1.02 and a standard deviation of 0.044 inch. Assuming the data may be treated a random sample from a normal population, determine a 95% confidence interval for the actual mean eccentricity of the cam shaft?

7M

UNIT-IV

7. a) An oceanographer wants to check whether the depth of the ocean in a certain region is 57.4 fathoms, as had previously been recorded. What can he conclude at the 0.05 level of significance, if readings taken at 40 random locations in the given region yielded a mean of 59.1 fathoms with a standard deviation of 5.2 fathoms? 7M
- b) The mean life of a sample of 10 electric bulbs was found to be 1456 hours with S.D. of 423 hours. A second sample of 17 bulbs chosen from a different batch showed a mean life of 1280 hours with S.D. of 398 hours. Is there a significant difference between the means of two batches? 7M

OR

8. a) A manufacturer claimed that at least 95% of the equipment which he supplied to a factory conformed to specifications. An examination of a sample of 200 pieces of equipment revealed that 18 were faulty. Test his claim at 5% level of significance. 7M
- b) The mean life time of a sample of 25 fluorescent light bulbs produced by a company is computed to be 157 hours with a S.D. of 120 hours. The company claims that the average life of the bulbs produced by the company is 1600 hours using the level of significance of 0.05. Is the claim acceptable? 7M

UNIT-V

9. a) The following random samples are measurements of the heat-producing capacity (in millions of calories per ton) of specimens of coal from two mines:

Mine 1:	8,260	8,130	8,350	8,070	8,340	---
Mine 2:	7,950	7,890	7,900	8,140	7,920	7,840

Use the 0.02 level of significance to test whether it is reasonable to assume that the variances of the two populations samples are equal. 7M

- b) A pair of dice are thrown 360 times and the frequency of each sum is indicated below:

Sum	2	3	4	5	6	7	8	9	10	11	12
Frequency	8	24	35	37	44	65	51	42	26	14	14

Would you say that the dice are fair on the basis of the Chi-square test at 0.05 level of significance? 7M

OR

10. a) An instructor has two classes A and B in a particular subject. Class A has 16 students while class B has 25 students. On the same examination, although there was no significant difference in mean grades, class A has a standard deviation of 9 while class B has a standard deviation of 12. Can conclude at the 0.01 level of significance that the variability of class B is greater than that of A? 7M
- b) A firm manufacturing rivets wants to limit variations in their length as much as possible. The lengths (in cms) of 10 rivets manufactured by a new process are

2.15	1.99	2.05	2.12	2.17
2.01	1.98	2.03	2.25	1.93

Examine whether the new process can be considered superior to the old if the old population has standard deviation 0.145 cm? 7M

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R-15

Code: 5G442

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

Software Engineering
(Information Technology)

Max. Marks: 70

Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. Importance of Software Myth? How Professionally recognize Software Myth Explain? 14M

OR

2. a) Discuss Software Development Lifecycle? 7M
b) Explain Waterfall Model 7M

UNIT-II

3. a) Illustrate the behavioral model with an example 7M
b) Is what way data model suitable for software Engineering Process 7M

OR

4. Elaborate the phase of the unified Process? 14M

UNIT-III

5. a) What are the Characteristics of a good design? 8M
b) Describe the Quality Attributes in Design Engineering 6M

OR

6. How fundamental software design concepts are evolved over the Software Engineering? Explain 14M

UNIT-IV

7. a) Discuss Strategic approach to software testing? 7M
b) Express user interface golden rules in Software Testing? 7M

OR

8. a) Distinguish between Regression Testing and Smoke Testing 10M
b) Describe Validation Testing? 4M

UNIT-V

9. a) Describe the difference between Risk Components and Risk Drivers 7M
b) Briefly Explain about RMMM plan 7M

OR

10. a) Importance of ISO9000 quality standards 7M
b) How do you implement software Reliability? Explain 7M
