Hall Ticket Number :										

R-14

Code: 4G141

II B.Tech. II Semester Supplementary Examinations May 2017

Computer Organization

(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) Represent the decimal numbers +1.7 and -0.012 in 32-bit floating point notation (IEEE standard 754). 6M

   b) Convert the following boolean function to its canonical form: F(x,y,z)= Σ(1,3,7) 8M

OR

2. a) Simplify the following expressions using Boolean algebra:
   i) A'B+ABC'+ABC' ii) AB+A(CD+CD') 6M

   b) Represent the decimal 8620 in BCD code, excess-3 code, 2421 code and as an unsigned binary number. 8M

UNIT–II

3. a) Design a 4-bit Adder-Subtractor circuit. 4M

   b) Illustrate the block diagram of hardware that implements the following register transfer statement: yT_2 : R2 ← R1, R1 ← R2 10M

OR

4. a) What do you mean by Reduced Instruction Set Computer (RISC)? Discuss relative advantages and disadvantages of such instruction set design. 7M

   b) With a neat flowchart, illustrate the different stages of an instruction cycle. What happens in case an instruction has some indirect memory references? 7M

UNIT–III

5. a) Define and differentiate between the following: micro-operation, micro instruction, microprogram and microcode. 8M

   b) Explain about control memory in a microprogrammed control organization. 6M

OR

6. Assume that the control memory of a microprogrammed control unit has 1024 words with 8 bits each. Draw the block diagram for the selection for address for this control memory. Also find the i) number of bits in the control address register, ii) the number of multiplexers required and iii) number of inputs in each multiplexer. 14M

UNIT–IV

7. Explain the Booth's multiplication algorithm with an example. 14M

OR

8. a) Design a 2M X 32 memory module using memory chips of capacity 512K X 8. 6M

   b) What is the major disadvantage of a direct mapped cache memory? A 4-way set associative cache has a size of 64 blocks. The main memory has 4096 blocks, each of 128 words. How many bits will be there in the main memory address? Also illustrate the bits required for each of the TAG, SET and WORD fields. 8M

UNIT–V

9. a) What is the major disadvantage of programmed I/O? How does the CPU decide priority when multiple devices raise interrupts? Explain the daisy chaining technique in this regard. 8M

   b) Define and differentiate between isolated I/O and memory-mapped I/O. Comment on the relative advantages and disadvantages of both. 6M

OR

10. a) With an example explain how delayed branching can handle branch instructions in a pipelined processor. 6M

    b) Explain how the steps of an instruction cycle can be devised as a 4-stage instruction pipeline. Draw the corresponding instruction pipeline. 8M

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Hall Ticket Number :										

Code: 5G142

R-15

II B.Tech. II Semester Regular Examinations May 2017

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)

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UNIT–I

1. a) What is an Algorithm? What are the properties of an algorithm? Explain the Pseudo code conventions for the algorithms. 7M

   b) Write an algorithm for addition of two m x n matrices. And compute the space and time complexities. 7M

OR

2. Explain Asymptotic Notations with examples. 14M

UNIT–II

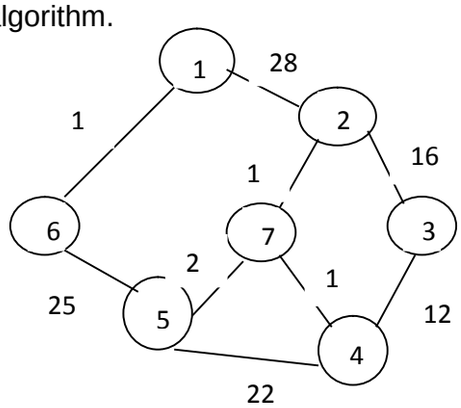
3. a) Explain divide and conquer. Write the control abstraction for divide and conquer. 7M

   b) Write the algorithm for Recursive binary search. Give the Binary decision tree for the list. -15, -6, 0, 7, 9, 23, 54, 82, 101, 112, 125, 131, 142, 151. 7M

OR

4. a) Write control abstraction for greedy method. 4M

   b) Explain Prim's algorithm. Obtain the minimum spanning tree of a given graph using Prim's algorithm.



10M

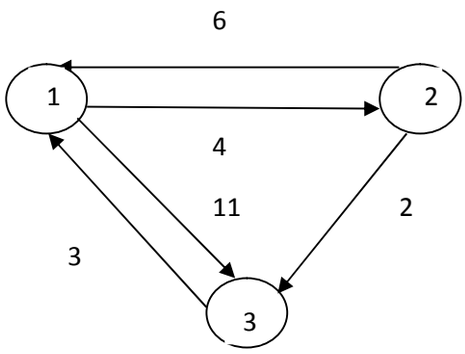
UNIT–III

5. a) Solve the following Knapsack problem using dynamic programming technique for m=6, n=3, (P1:P3)=(1,2,5) and (w1:w3)=(2,3,4). 7M

   b) Find the optimal tour of a given directed graph for the Travelling Sales Person problem using Dynamic Programming method. 7M

OR

6. a) Find the shortest paths from node 1 to every other node in the below given graph using All Pairs Shortest Path Algorithm.



9M

   b) Explain multistage graphs with example. 5M

UNIT–IV

7. a) What is backtracking? Give the General iterative backtracking method 6M

   b) Let w = {5, 7, 10, 12, 15, 18, 20} & m=35. Find all possible subsets of w that sum to m. Draw the portion of the state space tree that is generated. 8M

OR

8. Solve the following instance of travelling salesperson problem using LCBB.

$$\begin{pmatrix} \infty & 7 & 3 & 12 & 8 \\ 3 & \infty & 6 & 14 & 9 \\ 5 & 8 & \infty & 6 & 18 \\ 9 & 3 & 5 & \infty & 11 \\ 18 & 14 & 9 & 8 & \infty \end{pmatrix}$$ 14M

UNIT–V

9. a) Explain the classes P and NP. 7M

   b) Explain the Non-deterministic algorithm with example 7M

OR

10. State and Explain Cook's Theorem. 14M

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Hall Ticket Number :										

R-14

Code: 4G441

II B.Tech. II Semester Supplementary Examinations May 2017

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)

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UNIT–I

1. a) What are five main functions of a database management administrator? 7M
   b) Explain various storage manager components and its functions. 7M

OR

2. a) Explain major disadvantages of file-processing system. 7M
   b) With diagram, explain various components of database architecture. 7M

UNIT–II

3. a) With diagram, explain week entity 7M
   b) Draw ER diagram for the airport database incorporating all the ER notations with explanation. 7M

OR

4. a) What is a relation? Differentiate between a relation schema and a relation instance. 7M
   b) How can we translate an ER diagram into SQL statements to create tables. How are entities mapped into relations? How are relationships sets mapped? 7M

UNIT–III

5. a) Write SQL statement to list all rows(records) in which the inventory stock dates occur on or after January 20, 2008. 7M
   b) Briefly discuss about aggregate functions. Explain any three aggregate functions. 7M

OR

6. a) Write SQL statement to list all products, whose prices are between $50 and $100. 7M
   b) Briefly discuss about relational set operators. 7M

UNIT–IV

7. a) Define Boyce-Codd normal form(BCNF). How does it differ from 3NF? Why is it considered a strong form of 3NF. 7M
   b) Explain 2nd normal form(2 NF) with example. 7M

OR

8. a) Suppose you are given a relation R = (A,B,C,D,E) with the following functional dependencies: {CE→D, D→B, C→A}.
      i. Find all candidate keys.
      ii. Identify the best normal form that R satisfies (1NF, 2NF, 3NF, or BCNF). 7M
      iii. If the relation is not in BCNF, decompose it until it becomes BCNF. At each step, identify a new relation, decompose and re-compute the keys and the normal forms they satisfy.
   b) Explain 1st normal form(1 NF) with example. 7M

UNIT–V

9. a) With an example, explain serializable schedule. 7M
   b) How data organized in a tree-based index. When would you use a tree-based index. 7M

OR

10. a) Briefly discuss the AICD prosperities of transaction. 7M
    b) What are the main difference between ISAM and B+ tree indexes? 7M

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Hall Ticket Number :										

Code: 4G144

R-14

II B.Tech. II Semester Supplementary Examinations May 2017

Object Oriented Programming through JAVA

(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) Define the features of JAVA? 6M

   b) Write a Java program, which creates String object, store a numerical value in that object, and display the value in words. Ex; 120 should be displayed as ONE TWO ZERO 8M

OR

2. a) Discuss the Necessity of Garbage collection in Java? 7M

   b) Write a program to find out factorial of given number with recursion? 7M

UNIT–II

3. a) Explain Dynamic method Dispatch? 7M

   b) How to prevent overriding using final? 7M

OR

4. a) Why all the built in java classes are stored in packages? Justify 6M

   b) Identify difference between Interface and Class? 8M

UNIT–III

5. a) Write about Arithmetical exception handling? 7M

   b) Discuss the necessity of nested try blocks in Java? 7M

OR

6. a) Define Multi-threading? Give an example of an application that needs multithreading? 7M

   b) How multithreading is different from single processor to multi-processor? 7M

UNIT–IV

7. a) Explain the set interface and Queue interface? 6M

   b) Describe about the Hashset class and the EnumSet class? 8M

OR

8. a) What is the difference between Applet and Application? 8M

   b) Write about Grid Layout? 6M

UNIT–V

9 a) Write about Adapter classes? 7M

   b) Describe briefly about JFrame, JButtons? 7M

OR

10. a) Explain TCP/IP Client sockets? 8M

    b) What is UDP Datagram? 6M

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Hall Ticket Number :										

R-14

Code: 4GC42

II B.Tech. II Semester Supplementary Examinations May 2017

Probability and Statistics

(Common to CE, ME & 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) Define Conditional probability. State and prove Multiplication theorem of Probability. 7M

   b) A slip of paper is given to person A who marks it either with a plus sign or a minus sign, the probability of his writing a plus sign is 1/3. A passes the slip to B who may either leave it alone or change the sign before passing it to C. Next C passes the slip to D after perhaps changing the sign. Finally D passes it to a referee after perhaps changing the sign. The referee sees a plus sign on the slip. It is known that B, C and D each change the sign with probability 2/3. Find the probability that A originally wrote a plus. 7M

OR

2. a) i. The mathematical expectation of sum of n random variables is equal to the sum of their expectations, provided all the expectations exist i.e

   $X_1, X_2, \ldots\ldots\ldots X_n$ are random variables.

   $E[X_1, X_2, \ldots\ldots\ldots X_n] = E[X_1] + E[X_2] + \ldots\ldots\ldots + E[X_n]$

   ii. If X and Y are independent random variables then prove that $E[XY] = E[X]\,E[Y]$ 7M

   b) Probability density function of random variables X is ½ sinx in $0 \le x \le \pi$=0 elsewhere. Find Mean, Mode and Median for the distribution and also find the probability between 0 and $\frac{\pi}{2}$ 7M

UNIT–II

3. a) Derive Mean and Variance of Binomial Distribution. 7M

   b) Show that Poisson distribution as a limiting case of the Binomial distribution under the conditions that (i) p is very small (ii) n is very large and (iii) np = λ (say) is finite. 7M

OR

4. a) Psychological tests of Intelligence and of Engineering ability were applied to 10 students. Here is a record of ungrouped data showing Intelligence ratio (I.R) and Engineering ratio(E.R).Calculate the Coefficient of Correlation.

Student	A	B	C	D	E	F	G	H	I	J
I.R	105	104	102	101	100	99	98	96	93	92
E.R	101	103	100	98	95	96	104	92	97	94

7M

   b) The equations of two regression lines obtained in a correlation analysis are 3x + 12 y = 19, 3y + 9x = 46. Find

   (i) Coefficient of Correlation

   (ii) Mean values of X and Y

   (iii) The ratio of the coefficient of variability of X to that of Y. 7M

UNIT–III

5. a) i. A sample of size 400 is taken from a population whose standard deviation is 16. Find standard error and probable error. 7M

   ii. Define Type I and Type II errors, Null and Alternative hypothesis.

   b) A research worker wishes to estimate mean of a population by using sufficiently large sample. The probability is 95% that sample mean will not differ from the true mean by more than 25 percentage of the standard deviation. How large a sample should be taken? 7M

OR

6. a) i. A die is thrown 1536 times. An even integer obtained 1000 times. Test whether the die is unbiased.

   ii. The probability that a man aged 60 will live to be 70 is 0.6. What is the probability that out of 9 men 60 at least 6 will live to be 70? 7M

   b) A random sample of 400 men from one stage gives the mean pay of Rs 200 per day with a standard deviation of Rs 10/-. Another random sample of 400 men has a mean pay of Rs 190 per day with a standard deviation of Rs 9/-. Construct 99% confidence interval for μ_1-μ_2. 7M

UNIT–IV

7. a) The theory predicts that the proportion of beans available in four groups I, II, III, IV should be 4:3:2:6. In an experiment with 1500 beans the numbers in the four groups are 390, 305, 196, and 609. Use χ^2 test to verify whether the experiment results supports the theory. 7M

   b) Suppose that in the preceding exercise the first measurement is recorded incorrectly as 16.0 instead of 14.5. Show that now the difference between the mean of the sample is 14.7 and the average tar content by the cigarette manufacturer $\mu = 14.0$ is not significant at $\alpha = 0.05$. Explain the apparent paradox that even though the difference between sample mean and population mean has increased it is no longer significant. 7M

OR

8. a) The following are the values of skills of 2 samples with individuals 5 and 6.

Sample I	74.1	77.7	74.4	74	73.8	
Sample II	70.8	74.9	74.2	70.4	69.2	72.2

   (i) Is it possible that sample II has come from a population of mean 72?
   (ii) Test the hypothesis that the means of population of a first and second sample are equal.
   (iii) Obtain the confidence limits for the means of the population- II. 7M

   b) Explain the properties of F Distribution. 7M

UNIT–V

9. An inspection of 10 samples of size 400 each from 10 lots revealed the following number of defective units : 17,15,14,26,9,4,19,12,9,15

   Construct control limits for the number of defective units. Plot the control limits and the observations and state whether the process is under control or not. 14M

OR

10. a) Discuss about KENDALL'S Notation 7M

    b) Discuss about classification of Queing Models 7M

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Substitute Subject

Hall Ticket Number :										

R-14

Code: 4G142

III B.Tech. I Semester Supplementary Examinations May 2017

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)

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UNIT–I

1. Describe "Software myth"? Discuss on various types of software myths and the true aspects of these myths? 14M

OR

2. Explain in detail the capability Maturity Model Integration (CMMI)? 14M

UNIT–II

3. Illustrate about four types of non-functional requirements that may be placed on a system. Give examples of each of these types of requirement? 14M

OR

4. Write Short notes on
   a) Context models and 7M
   b) Data models 7M

UNIT–III

5. Describe the way of conducting a component level design? 14M

OR

6. Elaborate about Architectural styles and patterns? 14M

UNIT–IV

7. Discuss briefly about the golden rules for the user interface design? 14M

OR

8. Compare Black Box Testing and White Box Testing? 14M

UNIT–V

9. Explain about Metrics for software quality? 14M

OR

10. Classify in detail about ISO9000 quality standards? 14M

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