Hall Ticket Number :										

Code: 5G142

R-15

II B.Tech. II Semester Supplementary Examinations December 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) Define Space and Time Complexities with an example 7M

   b) Write an algorithm for finding minimum element of an array. Find best and worst case time complexities with an appropriate order notation. 7M

OR

2. What is meant by Disjoint Set? Explain the operations performed on disjoint sets with examples. 14M

UNIT–II

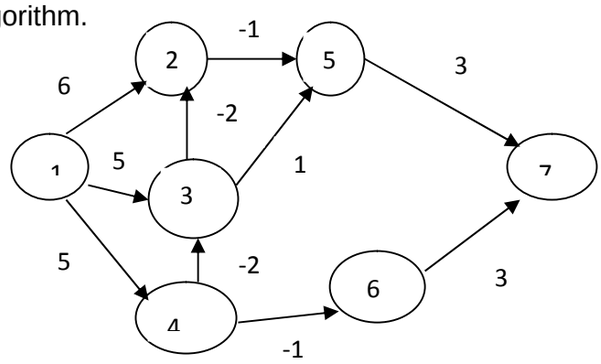
3. a) Distinguish between Quick Sort and Merge Sort according to their time complexities (derive time complexities). 7M

   b) Write recursive algorithm for Binary Search. And derive it's time complexity. 7M

OR

4. a) Find an optimal solution for the Job Sequencing with deadlines problem with n=7,(P1:P7)=(3,5,20,18,1,6,30) and (d1:d7)=(1,3,4,3,2,1,2) 7M

   b) Find the shortest paths from source 1 to remaining all nodes using Shortest Path Algorithm.



7M

UNIT–III

5. Using OBST algorithm, compute w (i, j) , r (i, j) & c(i, j), $0 \le I < j \le 4$, for the identifier set (a1,a2,a3,a4) = (do, if, int, while) with p(1:4)=(3,3,1,1) and q(0:4)=(2,3,1,1,1). Using r(i,j) construct the OBST. 14M

OR

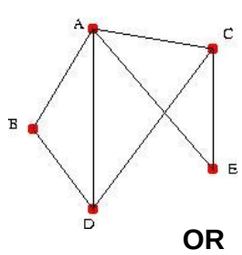
6. a) Write the control abstraction for Dynamic programming. 5M

   b) Explain Matrix Chain Multiplication Algorithm with an example. 9M

UNIT–IV

7. a) State and explain 8-Queen's problem with an example. 8M

   b) What is Hamiltonian Cycle? Apply backtracking to find Hamiltonian cycle in the below graph.



6M

OR

8. Draw the portion of the state space tree generated by LCBB for the following knapsack instances: n=4,(P1:P4)=(10,10,12,18), (w1:w4)=(2,4,6,9) and m=15. 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-15

Code: 5G441

II B.Tech. II Semester Supplementary Examinations December 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)

UNIT–I

1. a) What are the different types of user interface designed for database users? Discuss the main activities of each. 7M

   b) Briefly discuss about architecture of database system with diagram. 7M

OR

2. a) List four significant difference between a file processing system and a DBMS. 7M

   b) Explain various query processor components and its functions. 7M

UNIT–II

3. Draw ER diagram for the company database incorporating all the ER notations with explanation. 14M

OR

4. a) What are the steps in designing a database? 7M

   b) With examples, explain enforcing integrity constraint. 7M

UNIT–III

5. a) Write SQL statement to get a list of out-of-warranty products that have been stored more than 90 days. 7M

   b) Briefly discuss about virtual table. 7M

OR

6. a) Write SQL statement to see a listing of all rows for which the vendor code is not 21344. 7M

   b) With an example, explain trigger and its needs. 7M

UNIT–IV

7. a) Compute the closure of the following set F of functional dependencies for relation schema r (A, B, C, D, E).

   $A \rightarrow BC$

   $CD \rightarrow E$

   $B \rightarrow D$

   $E \rightarrow A$ 7M

   b) With an example, explain 1st normal form(NF). 7M

OR

8. a) Give an example of a relation schema R and a set of dependencies such that R is in BCNF but is not in 4NF. 7M

   b) With an example, explain 2nd normal form(2 NF). 7M

UNIT–V

9. a) How does a B+ tree index handle search, insert and delete? 7M

   b) With diagram, explain tree structure index. 7M

OR

10. a) Describe how search, insert and delete operations work in ISAM indexes. 7M

    b) How data organized in a hash-based index. When would you use a hash-based index? 7M

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Hall Ticket Number :										

R-15

Code: 5GC43

II B.Tech. II Semester Regular Examinations May 2017

Environmental Science

(Common to CE, ME & CSE)

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) Illustrate the scope & Importance of environmental studies 7M
   b) How does the declination of ecosystems occurs? 7M

OR

2. a) What is the scope and importance of environmental studies? 7M
   b) Describe the multidisciplinary nature of environmental studies. 7M

UNIT–II

3. a) Write about the applications of alternative energy resources 7M
   b) Write about the importance of natural resources 7M

OR

4. a) Distinguish between traditional agricultural and modern agricultural. 7M
   b) Summarize the effects of dams on forest and tribal people. 7M

UNIT–III

5. a) Write short note on sustainable development with examples. 7M
   b) Write short note on food chain and food web with examples. 7M

OR

6. a) What are the various threats leading to loss of biodiversity? 7M
   b) Discuss the various strategies of in-situ conservation of biodiversity 7M

UNIT–IV

7. a) How does the biodiversity is maintained ? 7M
   b) What are the various methods of control to reduce thermal pollution? 7M

OR

8. a) Explain about causes of marine pollution. 7M
   b) Explain about causes of noise pollution. 7M

UNIT–V

9. a) Explain about causes of air pollution. 7M
   b) What are the salient provisions of Wild life Act? 7M

OR

10 Explain the value of environment education and the role of women and environment. 14M

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Hall Ticket Number :										

R-15

Code: 5G143

II B.Tech. II Semester Supplementary Examinations December 2017

Formal Languages and Automata Theory

(Computer Science and Engineering)

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 DFA, NFA and ε-NFA. 6M

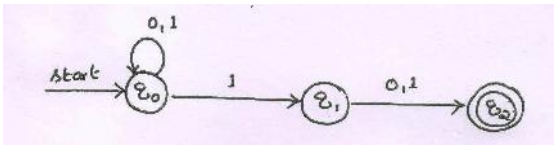
   b) Design a DFA

      i. to accept a strings of a's and b's not ending with abb.

      ii. to accept odd number of 0's and odd number of 1's. 8M

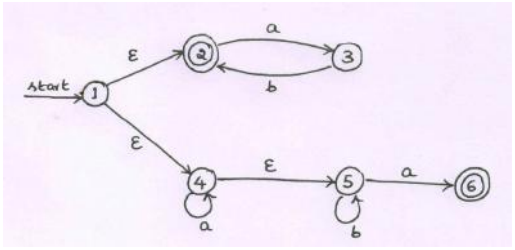
OR

2. a) Convert the following NFA and DFA.



7M

   b) Convert the following ε-NFA and DFA.



7M

UNIT–II

3. a) Define Regular Expression. Write the Regular Expressions for the following languages.

      i. $L = \{ a^n b^m \mid n \le 4, m \ge 2 \}$

      ii. Strings of 0's and 1's having no two consecutive zeros.

      iii. Strings of 0's and 1's whose lengths are multiples of 3.

      iv. Strings of a's, b's and c's such that fourth symbol from the right is a and ends with b. 10M

   b) Covert the Regular Expression (0+1)* 1 (0+1) to an ε-NFA. 4M

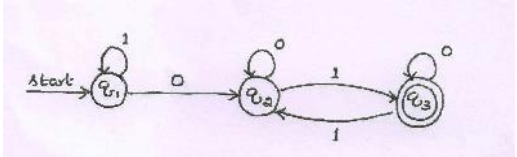
OR

4. a) Prove that the following languages are not regular.

      i. $L = \{ 0^n 1^{n+1} \mid n>0 \}$

      ii. $L = \{ a^n b^n \mid n \ge 1 \}$ 10M

   b) Find the Regular Expression from the following finite automation.



4M

UNIT–III

5. a) Construct the CFG for the following languages.
   i. $L = \{ a^{2n}b^m \mid n \geq 0, m \geq 0 \}$
   ii. $L = \{ 0^i1^j2^k \mid i = j \text{ or } j = k \}$ 6M

   b) Prove that the following grammar is ambiguous, using the string "ibtibtaea".
   $S \rightarrow iCtS \mid iCtSeS \mid a$ 8M

OR

6. a) Define the following terms, leftmost derivation, rightmost derivation, sentential form, yield of a tree with an example. 8M

   b) Convert the following grammar to CNF $S \rightarrow aSb \mid ab \mid Aa$, $A \rightarrow aab$. 6M

UNIT–IV

7. a) Define PDA. Describe the languages accepted by PDA. 5M

   b) Design PDA to accept the following language by final sate.
   $L = \{ w \mid w \varepsilon \{a.b\}^*, n_a(w) = n_b(w) \}$, show the moves made by the PDA for the string "abbaba". 9M

OR

8. a) Convert the following grammar to PDA that accepts the same language by empty stack $S \rightarrow 0S1 \mid A$, $A \rightarrow 1A0 \mid S \mid \varepsilon$ 8M

   b) Design a PDA, equivalent to the following grammar.
   $S \rightarrow AS \mid \varepsilon$, $A \rightarrow 0A1 \mid A1 \mid 01$ 6M

UNIT–V

9. a) Design a Turing machine for the language to accept the set of strings with equal number of 0's and 1's. 8M

   b) Write transition diagram and instantaneous description on the string "110100". 6M

OR

10. a) Explain
   i. Universal Turing Machine
   ii. Church's hypothesis 10M

   b) Discuss LR(0) grammar. 4M

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Hall Ticket Number :										

Code: 5G144

R-15

II B.Tech. II Semester Supplementary Examinations December 2017

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) Describe Primitive, Boolean data Types? 7M
   b) Write about Relational and Logical Operations? 7M

OR

2. a) Discuss about Method Overloading? 7M
   b) How a constructor is different from other Methods in Java? 7M

UNIT–II

3. a) Explain Dynamic Method Dispatch? 7M
   b) How to prevent Overriding using Final? 7M

OR

4. a) Compare the class and Interface? 7M
   b) Define a package and Class path? 7M

UNIT–III

5. a) Distinguish throw and throws? 6M
   b) What do mean by an Exception and error? Give the hierarchy of the exceptions in Java? 8M

OR

6. a) Write about thread Life cycle? 6M
   b) Why thread in called light weight task and process heavy weight task? 8M

UNIT–IV

7. a) Explain the List interface and the stored set interface? 7M
   b) Describe about the Tree set class and the array deuce classes? 7M

OR

8. a) Discuss the life cycle of an Applet? 7M
   b) Write about Border Layout? 7M

UNIT–V

9. a) Discuss about Event Listeners? 7M
   b) Write about Component and Containers? 7M

OR

10. a) Describe briefly about TCP, UDP, URL? 6M
    b) What is InetAddress? How to create an InetAddress? 8M

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Hall Ticket Number :										

R-15

Code: 5G141

II B.Tech. II Semester Supplementary Examinations December 2017

Computer Organization

(Computer Science Engineering)

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 -7.1 and -2.01 in 32-bit floating point notation (IEEE standard 754). 7M

   b) Convert the following boolean function to its canonical form: F(A, B, C, D)= π (0,1,2,4,6,12). 7M

OR

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

   b) Represent the decimal 8264 in BCD code, excess-3 code, 2421 code and as an unsigned binary number. 8M

UNIT–II

3. a) Design a 4-bit incrementer circuit. 4M

   b) Represent the following conditional control statement by two register transfer statements with control functions: If (*P*=1) then (*R1* ←*R2)* else if (*Q*=1) then (*R1* ←*R3).* 10M

OR

4. a) What do you mean by Complex Instruction Set Computer (CISC)? Discuss relative advantages and disadvantages of such instruction set design. 6M

   b) Explain the different phases of an instruction cycle. What happens in case an instruction has some memory operands? 8M

UNIT–III

5. a) Define and differentiate between microprogrammed control unit and hardwired control unit. Point the relative pros and cons of each organization. 8M

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

OR

6. Assume that the control memory of a microprogrammed control unit has 4096 words with 24 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. Multiply the two signed binary integers using the Booth's multiplication algorithm: A=100101, B=011011 14M

OR

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

   b) With a flowchart, illustrate the addition and subtraction of floating point numbers. 8M

UNIT–V

9. a) What do you mean by handshaking? With neat diagrams, explain the difference between source initiated and destination initiated asynchronous data transfers. 8M

   b) What do you mean by DMA? With a neat block diagram, explain the working of this mode of data transfer. 6M

OR

10. a) Why are interleaved memory organizations very effective for pipelined and vector processors? Explain the multiple module interleaved memory organization with an example. 8M

    b) Explain how the floating point addition subtraction operation can be devised as a 4-stage pipeline. Draw the corresponding arithmetic pipeline. 6M

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