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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

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

Computer Organization

(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)

UNIT-I

1. a) Explain about multi processors and multi computers. 7M
 b) What is meant by odd parity and even parity? Explain them. 7M

OR

2. a) Distinguish between error detection and correction codes 7M
 b) Registers R1 and R2 of a computer contain the decimal values 12000 and 6000 respectively. What is the effective address of the memory operand in each of the following instructions?
 i) MOV 20 (R1), R5 ii) STORE R5, 30 (R1, R2)
 iii) LOAD #3000, R5 iv) ADD - (R2), R5 7M

UNIT-II

3. a) What is an addressing mode? List various addressing modes and write brief notes on each. 8M
 b) For the pattern $X = (A+B)*(C+D)$, explain three-, two-, one- and zero-address instructions by giving the syntax. 6M

OR

4. a) Explain the Memory reference instructions with suitable examples? 7M
 b) Briefly explain the arithmetic logic shift unit. 7M

UNIT-III

5. What are the design goals while designing the Control Unit? Explain the Hardwired control and Micro programmed control. Mention their advantages and disadvantages. 14M

OR

6. a) What is microprogramming? Compare hard-wired control and micro-programmed control. 7M
 b) What are the two methods to reduce the number of microinstructions needed by the control unit? Explain, in detail, with suitable examples. 7M

UNIT-IV

7. a) Perform the 2's complement multiplication for the signed integer operands: $(-13) * (-10)$ using Booth's recoding scheme 7M
 b) Derive and explain an algorithm for adding and subtracting 2 floating point binary numbers. 7M

OR

8. a) Explain division algorithm with example 7M
 b) Explain different types of mapping functions in cache memory. 7M

UNIT-V

9. a) What are handshaking signals? Explain the handshake control of data transfer during input and output operation. 7M
 b) What is meant by instruction pipeline? Explain 7M

OR

10. What is Direct Memory Access (DMA)? What is the need for DMA? Explain the working of DMA. Also mention its advantages. 14M

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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 $(P_1, P_2, P_3, P_4, P_5) = (20, 15, 10, 5, 1)$ and deadlines $(d_1, d_2, d_3, d_4, d_5) = (2, 2, 1, 3, 3)$. 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 $(p_1, p_2, p_3) = (1, 2, 5)$, weights are $(w_1, w_2, w_3) = (2, 3, 4)$. 14M

UNIT-IV

7. Draw a portion of the state space tree Solve the following 0/1 Knapsack problem using Backtracking $m = 30$, $n = 4$, $(w_1, w_2, w_3, w_4) = (10, 15, 6, 9)$ and $(p_1, p_2, p_3, p_4) = (2, 5, 8, 1)$. 14M

OR

8. Consider the knapsack instance $n=4$; $(p_1, p_2, p_3, p_4) = (10, 10, 12, 18)$; $(w_1, w_2, w_3, w_4) = (2, 4, 6, 9)$ 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. 8M
 - 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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R-15

Code: 5GC43

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

Environmental Science

(Common to CE, ME and CSE)

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 role of individual in protecting the environment 7M
b) Explain hydrosphere, lithosphere in detail. 7M

OR

2. a) Write about major environmental problems of world. 7M
b) Explain Bhopal gas tragedy in detail 7M

UNIT-II

3. a) Explain any two case studies on dams and mines over exploitation 7M
b) Explain hydrological cycle in detail. 7M

OR

4. a) Explain definition and impacts of soil erosion. 7M
b) Explain various applications of any two renewable energy resources. 7M

UNIT-III

5. a) Explain ecological pyramids with examples. 7M
b) Explain energy flow in eco system in detail. 7M

OR

6. a) Write a short note on habitat loss and poaching of wild life. 7M
b) Explain in situ conservation strategies in detail. 7M

UNIT-IV

7. a) Write in detail about sources and effects of water pollution. 7M
b) Explain nuclear pollution in detail. 7M

OR

8. a) Write about sources and impacts of improper solid waste management. 7M
b) Write a short note on incineration and sanitary land filling. 7M

UNIT-V

9. a) Explain ozone layer depletion in detail. 7M
b) Write about various methods of waste land reclamation. 7M

OR

10. a) Write in detail about family welfare programmes. 7M
b) Write a note on environment and human health. 7M

Code: 5G143

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

Formal Languages and Automata Theory

(Computer Science & Engineering)

Max. Marks: 70

Time: 3 Hours

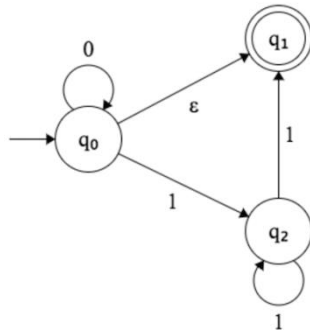
Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. a) List the applications of finite automata. 7M
- b) Define Chomsky hierarchy of languages. 7M

OR

2. a) Consider the following NFA-ε



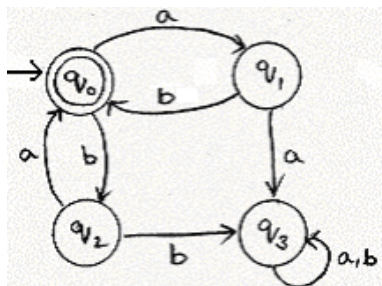
- i. Compute the ε - closure of each state
- ii. Remove ε-Moves for the given NFA-ε. 8M
- b) Distinguish between DFA and NFA. 6M

UNIT-II

3. a) Construct a DFA for the regular expression $r = (a+b)^*abb$ 9M
- b) Define recursive definition of Regular Expression 5M

OR

4. a) Construct the regular expression accepted by following finite automaton.



- b) Describe a pumping lemma. What are its applications? 8M
- b) Describe a pumping lemma. What are its applications? 6M

UNIT-III

5. a) Construct left linear and right linear grammar for the language. 8M

$((01 + 10)^* 11)^* 00)^*$

- b) Find the left most and right most derivations for the given grammar for the string

abbba
 $S \rightarrow abB$
 $A \rightarrow aaBb$
 $B \rightarrow bbAa$
 $A \rightarrow \epsilon$

6M

OR

6. a) Convert the following grammar to GNF
 $S \rightarrow Ba/ab$
 $A \rightarrow aAB/a$
 $B \rightarrow ABb/b$ 8M
- b) Discuss the Pumping lemma for Context Free Languages concept with example $\{a^n b^n c^n \text{ where } n \geq 0\}$. 6M

UNIT-IV

7. a) Differentiate PDA by empty stack and final state by giving their definitions. 6M
- b) Construct PDA to accept the set of all strings of palindromes over $\{a, b\}$ 8M

OR

8. a) Construct PDA to accept the CFG
 $S \rightarrow aABC$
 $A \rightarrow aB/C$
 $B \rightarrow bA/b$
 $C \rightarrow a$ 9M
- b) Define DPDA and DCFL 5M

UNIT-V

9. a) Explain various types of Turing machines. 6M
- b) Construct Turing Machine to compute addition function for two unary numbers
 $f(X, Y) = X + Y$ 8M

OR

10. a) Construct LR(0) items for the grammar given, find its equivalent DFA.
 $S' \rightarrow S$
 $S \rightarrow A S \mid \lambda$
 $A \rightarrow a A \mid b$ λ is null. 9M
- b) Explain about the Post's Correspondence Problem 5M
