Code: 4G141

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
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) State and prove DeMorgan's theorem.   4M

    b) Design a combinational circuit such that the 4 bit output is an excess-3 of its
        applied 4-bit input to the circuit.   10M

OR

2. a) Specify the characteristics of ASCII code. Identify the string represented by the
        following ASCII sequence: 1000011 1010011 1000101.   7M

    b) A 24 bit binary number is represented in floating point representation. 8 bits are
        used for exponent and the rest used to represent the mantissa part. The mantissa
        and exponent are both represented in 2's complement representation. Determine
        the range of numbers possible in this representation.   7M

UNIT–II

3. a) What is a bus? Depict with a neat sketch, a 4-bit bus is shared among 4
        registers using multiplexers and explain its functionality.   7M

    b) Enumerate the sixteen logic micro-operations of a digital computer. Which one
        of these is used to implement equivalence function?   7M

OR

4. a) List and explain any four memory reference instructions.   7M

    b) Define stack. Explain the uses of stack memory and its organization in digital
        computer design.   7M

UNIT–III

5. a) What is a control memory? Explain the process of generating control address
        from an instruction code.   7M

    b) Assume that the first 9 bits of a 20 bit microinstruction format are divided into

F1	Microoperation	Symbol
000	None	NOP
001	AC ← AC + DR	ADD
010	AC ← 0	CLRAC
011	AC ← AC + 1	INCAC
100	AC ← DR	DRTAC
101	AR ← DR(0-10)	DRTAR
110	AR ← PC	PCTAR
111	M[AR] ← DR	WRITE

F2	Microoperation	Symbol
000	None	NOP
001	AC ← AC- DR	SUB
010	AC ← AC ∨ DR	OR
011	AC ← AC ∧ DR	AND
100	DR ← M[AR]	READ
101	DR ← AC	ACTDR
110	DR ← DR + 1	INCDR
111	DR(0-10) ← PC	PCTDR

three fields as follows:

F3	Microoperation	Symbol
000	None	NOP
001	AC ← AC ⊕ DR	XOR
010	AC ← AC'	COM
011	AC ← shl AC	SHL
100	AC ← shr AC	SHR
101	PC ← PC + 1	INCPC
110	PC ← AR	ARTPC
111	Reserved	

Specify the 9-bit microoperation field for the following microoperations:

(i)   AC ← AC + 1; AC ^ DR;

(ii)   DR ← DR + 1; PC ← AR; AC ← 0;   7M

OR

6. a) State the pros and cons of microprogrammed control unit over hardwired control unit. 4M

   b) Describe the organization and functions of a microprogram sequencer for control memory. 10M

UNIT–IV

7. a) Explain the functional units and their data flow in a hardware implementation that performs addition and subtraction of signed-magnitude numbers. 7M

   b) Depict the sequence of operations performed in the Booth's algorithm to perform multiplication of signed-magnitude numbers. 7M

OR

8. a) Relate the virtual memory with that of main memory. Discuss various page replacement policies used in virtual memory system 7M

   b) Differentiate between 'write-through' and 'write back' cache techniques. Explain these techniques with suitable example. 7M

UNIT–V

9. a) Explain the interrupt-initiated data transfer between I/O devices with CPU with emphasize on interrupt priority resolution. 7M

   b) Illustrate the CPU-IOP communication to perform direct memory access. 7M

OR

10. a) Explain the structure of a four-stage pipeline. 7M

    b) Enumerate the applications of array-processors. 7M

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II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
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) Discuss about different types of data models?　　　　　　　　　　　7M
   b) Define data abstraction and discuss levels of abstraction?　　　　　7M

OR

2. a) Describe the structure of DBMS?　　　　　　　　　　　　　　　　8M
   b) Explain about transaction management?　　　　　　　　　　　　　6M

UNIT–II

3. a) Discuss additional features of the ER-Models.　　　　　　　　　　7M
   b) Define the terms **i)** Entity **ii**) Entity set **iii**) weak entity set **iv**) strong entity set?　　7M

OR

4. a) Write about views and updates on views?　　　　　　　　　　　　8M
   b) Differentiate DBMS and RDBMS?　　　　　　　　　　　　　　　6M

UNIT–III

5. a) Describe logical connectives of SQL with examples?　　　　　　　7M
   b) Demonstrate how to add a NOT NULL column to a table?　　　　　7M

OR

6. a) Discuss the basic form of SQL query?　　　　　　　　　　　　　4M
   b) Define a nested query?
      i.　Write a nested query to find the names of sailors who have reserved both a red and green boat.
      ii.　Write a nested query to find the names of sailors who have reserved all boats.　　　　　　　　　　　　　　　　　　　　　　　　10M

UNIT–IV

7. a) Define decomposition and how does it address redundancy? Discuss the problem s that may be caused by the use of decompositions?　　　5M
   b) Explain 1NF, 2NF, 3NF normal forms?　　　　　　　　　　　　　9M

OR

8. a) Define functional dependencies. How are primary keys related to FD's?　6M
   b) Illustrate multi valued dependencies and fourth normal form with example?　8M

UNIT–V

9. a) Discuss how do you implement atomicity and durability?　　　　　7M
   b) Discuss serializability in detail?　　　　　　　　　　　　　　　　7M

OR

10. a) Discuss about data on external storage?　　　　　　　　　　　　6M
    b) Explain in detail about ISAM?　　　　　　　　　　　　　　　　8M

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Code: 4GC43

R-14

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
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)
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UNIT–I

1. a) Explain the components of environment and their major interactions?
    b) Write a brief note on "Global Environmental Crisis"

OR

2. a) Explain the multi disciplinary nature of Environmental Studies?
    b) Describe the impact of over-exploitation of natural resources?

UNIT–II

3. a) Explain the environmental impacts of deforestation?
    b) Explain the adverse environmental impacts of modern agriculture?

OR

4. a) Compare various types of energy with respect to its suitability for Indian conditions?
    b) Discuss various types of land degradation with its causes and remedial measures?

UNIT–III

5. a) Explain role of producers, consumers and decomposers in an ecosystem
    b) Explain the components and functions of a Forest ecosystem

OR

6. a) Describe the importance and values of biodiversity?
    b) Explain in-situ and ex-situ conservation of biodiversity with examples

UNIT–IV

7. a) Enumerate major air pollutants and explain their effects on human beings
    b) Describe various sources of marine pollution. How can you prevent pollution of our oceans?

OR

8. a) Discuss major causes and effects of soil pollution
    b) Explain the process of composting as applied for the management of Solid Waste Management

UNIT–V

9. a) Explain the acid rain and its impacts. How can we avoid it?
    b) Explain environmental problems posed by population explosion?

OR

10. a) Discuss salient features of Air (prevention and control of pollution) Act, 1981
    b) Explain the term "human rights". What is the status of human rights in India?

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Code: 4G143

R-14

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
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)
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UNIT–I

1. a) Distinguish between NFA and DFA with suitable examples   7M

    b) Explain how an equivalent DFA is obtained from NFA with suitable example   7M

OR

2. a) Construct the Moore machine for the given melay machine

Q/	a	b	output
→q_0	q_1	q_2	1
q_1	q_1	q_1	0
q_2	q_1	q_0	1

7M

    b) Minimize the finite automaton given below and show that both given and reduced automaton are equal

Q/	A	B
→q_0	q_0	q_3
q_1	q_2	q_5
q_2	q_3	q_4
q_3	q_0	q_5
q_4	q_0	q_6
q_5	q_1	q_4
q	q_1	q_3

7M

UNIT–II

3. a) Write the Procedure to convert the regular grammar to finite automaton   7M

    b) Write the regular expression for the following languages

    i) Language that accepts all the strings of odd length

    ii) L is a language that accepts all the strings of length n where n is divisible by 3   7M

OR

4. a) State and prove Pumping lemma for regular languages   7M

    b) Show that the language L={$a^i b^{2i}$/ i>0} is not regular using pumping lemma   7M

UNIT–III

5. a) Construct a CFG to generate set of Palindrome's over alphabet {a,b} and construct Left Most derivation tree for the string "abba" using the same. 7M

   b) Write the procedure to convert right linear grammar to left linear grammar. 7M

OR

6. a) Define ambiguity of the grammar. Show that the following grammar is ambiguous

   S → a | Sa | bSS | SSb | SbS 7M

   b) Convert the following CFG to CNF

   S → AA | a

   A → SS | b 7M

UNIT–IV

7. a) Explain the Process of converting CFG to PDA with a suitable example 7M

   b) Define PDA. Design PDA for the language $L=\{WCW^R/W \in \{a,b\}^+\}$

   where W^R represents reverse string 7M

OR

8. a) Design a PDA for the language $L=\{a^n b^{2n+1}/n>=1\}$ and process the string "aaabbbbbbb" 7M

   b) Design a PDA for the language $L=\{a^n b^n /n>0\}U\{a^n b^{2n}/ n>0\}$ 7M

UNIT–V

9. a) Explain NP hard and NP complete problems with suitable examples 7M

   b) Design a Turing Machine that recognizes the words of the form $L=\{0^n 1^n/n>0\}$ 7M

OR

10. a) Write a short notes on the following

    a) Universal Turing machine

    b) Post Correspondence Problem 8M

    b) What is decidability? Explain 4 problems that satisfy the problem of decidability. 6M

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II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
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) Explain relational operators in java.   5M
    b) Java does not support goto statement. Why?   4M
    c) Explain garbage collection in Java.   5M

OR

2. a) Explain the OOPs concepts: Encapsulation, Polymorphism and Abstraction   7M
    b) Explain the java buzz words.   4M
    c) What is the difference between String and StringBuffer objects?   3M

UNIT–II

3. a) Explain method overriding with an example.   7M
    b) Explain the different levels of access protection in java.   7M

OR

4. a) Explain the difference between class and interface with an example each.   7M
    b) Explain in detail the process of creating, defining, importing and accessing a
        package with suitable examples   7M

UNIT–III

5. a) Explain the creation and usage of your own exception with an example.   7M
    b) Explain thread synchronization with an example.   7M

OR

6. a) Write the differences between multithreading and multi tasking.   3M
    b) Write short notes on ThreadGroup class.   4M
    c) Explain the creation of thread using Runnable interface with an example.   7M

UNIT–IV

7.   Explain in detail any four classes of the java.net package.   14M

OR

8. a) Write the differences between applet and an application program.   7M
    b) Write an applet to display the current date and time.   7M

UNIT–V

9. a) Describe delegation event model   5M
    b) Write the limitations of AWT components   4M
    c) Write a java program to illustrate TextEvent.   5M

OR

10. a) Write a java program to display the month names by JList and display the
        days by JComboBox.   7M
    b) In what way JButton is better than Button class? Explain it with an example. 7M
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II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Software Engineering
(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) Explain Water fall Model.   5M
   b) What are the problems that are sometimes encountered when the waterfall
      model is applied?   9M

OR

2. a) Explain in detail about CMMI   9M
   b) Briefly explain Spiral Model. What the situations at where this model is applicable?   5M

UNIT–II

3. a) Explain the feasibility studies. What are the outcomes? Does it have either
      implicit or explicit effects on software requirement collection?   10M
   b) Describe how software requirements are documented? State the importance
      of documentation.   4M

OR

4. a) Define RMMM Plan.   8M
   b) Differentiate between requirements validation and requirements management   6M

UNIT–III

5. a) Explain the importance of user interface design in sale of software.   6M
   b) Describe decomposition levels of abstraction and modularity concepts in
      software design.   8M

OR

6. a) Justify "Design is not coding and coding is not design".   8M
   b) How does a real time system design differ comparing distributed system
      design?   6M

UNIT–IV

7. a) How the requirements are collected for user interface of software?   7M
   b) Describe the important principles and steps of user interface analysis and design.   7M

OR

8. a) Write short notes on equivalence partitioning.   7M
   b) How regression and stress tests are performed?   7M

UNIT–V

9. a) Discuss briefly on software maintenance activities and how do you estimate
      the cost involved.   7M
   b) Describe two metrics which are used to measure the software in detail.
      Discuss clearly the advantages and disadvantages of these metrics.   7M

OR

10. a) Write briefly on CASE and Software complexity measure.   7M
    b) Discuss the concept of software maintenance process.   7M
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