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**Code: 4G153** **R-14**

*III B.Tech. I Semester Supplementary Examinations May 2017*

# Compiler Design

(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) Explain various phases of a compiler. 8M
   b) Compare multi pass and single pass compiler? 6M

**OR**

2. a) Write short notes on bootstrapping process. 7M
   b) Write a LEX program for identifying the keywords and identifiers. 7M

**UNIT–II**

3. What is top down parsing? Construct LL (1) parsing table for the following grammar.

   E → E+T | T
   T → T*F | F
   F → (E) | id 14M

**OR**

4. a) What are the difficulties in top down parsing? Explain in detail 7M
   b) Consider the following grammar

   S → (L) | a
   L → L, S | S

   Construct leftmost derivations and parse trees for the following sentences:

   **i.** (a,(a,a)) **ii.** (a,((a,a),(a,a))). 7M

**UNIT–III**

5. a) What is Type Expression? Write type Expressions for the following
      i. A Two dimensional array integers (i.e. an array of arrays) whose rows are indexed from 0 to 9 and whose columns are indexed from -10 to 10.
      ii. Functions and records. 7M
   b) Explain the stack implementation of shift reduce parsing method with an example 7M

**OR**

6. Construct Canonical LR parsing table for the following grammar

   S → CC
   C → cC / d 14M

**UNIT–IV**

7. a) What is self-organizing list? Explain with an example, Show the symbol table organization for block structured language 7M
   b) Write the quadruple, triple, indirect triple for the statement
   **a := b* − c + b* − c.** 7M

**OR**

8. a) What is an activation record? Compare three different storage allocation strategies. 7M
   b) Draw syntax tree for the arithmetic expressions 7M

**UNIT–V**

9. Explain different principal sources of optimization technique with suitable examples 14M

**OR**

10. a) Explain live variable analysis with example. 7M
    b) Explain redundant sub expression elimination with example 7M

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**R-14**

**Code: 4G151**

*III B.Tech. I Semester Supplementary Examinations May 2017*

# Computer Networks

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

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

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**UNIT–I**

1. a) Compare the functions of ISO model and TCP/IP protocol architectures. 7M
   b) Distinguish between circuit switching and packet switching networks. 7M

**OR**

2. a) What is computer network? Write about network hardware and software. 7M
   b) Discuss the characteristics of co-axial cable and give its advantages and disadvantages. 7M

**UNIT–II**

3. a) Define checksum. Explain how check sum is used for error detection with example. 7M
   b) Draw the frame format of Ethernet and explain it. 7M

**OR**

4. a) Describe about the working of stop and wait protocol. 7M
   b) Explain CSMA/CD protocol in MAC layer. 7M

**UNIT–III**

5. a) Describe about flooding and shortest path routing algorithm. 7M
   b) What is a subnet? Differentiate between virtual circuits and datagram subnets. 7M

**OR**

6. a) Explain about hierarchical routing algorithm with example. 7M
   b) Define internetworking. Explain about ICMP protocol. 7M

**UNIT–IV**

7. a) Describe the services offered by transport layer. 7M
   b) What is flow control? Explain its role in transport layer. 7M

**OR**

8. a) Briefly explain the elements of transport layer. 7M
   b) Explain about TCP header format. 7M

**UNIT–V**

9. a) How security is maintained in internet. Illustrate it with examples. 7M
   b) Write short notes on FTP and HTTP. 7M

**OR**

10. a) Explain the naming hierarchy in DNS with an example. 7M
    b) Write about WWW and multimedia. 7M

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**R-14**

**Code: 4G451**

*III B.Tech. I Semester Supplementary 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 = 70Marks )

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**UNIT–I**

1. Explain in brief about Asymptotic Notations with examples 14M

**OR**

2. a) Explain the method of determining the complexity of procedure by the step count approach. Illustrate with an example. 6M

   b) Compare with an example simple Find and Collapsing Find 8M

**UNIT–II**

3 a) Write and explain the control abstraction for Divide and Conquer. 4M

   b) Find an optimal solution to the knapsack instance n=7 objects and the capacity of knapsack m=15. The profits and weights of the objects are (P1, P2, P3, P4, P5, P6, P7) = (10, 5, 15, 7, 6, 18, 3)
   (W1, W2, W3, W4, W5, W6, W7) = (2, 3, 5, 7, 1, 4, 1) 10M

**OR**

4. a) Explain partition exchange sort algorithm and trace this algorithm for n =8 elements: 24,12, 35, 23,45,34,20,48 7M

   b) Discuss the single – source shortest paths algorithm with suitable example. 7M

**UNIT–III**

5. a) What is principle's of optimality? Explain how travelling sales person problem uses the dynamic programming technique with example. 7M

   b) Give the statement of sum –of subsets problem. Find all sum of subsets for n=4, (w1, w2, w3, w4) = (11, 13, 24, 7) and M=31.Draw the portion of the state space tree using fixed – tuple sized approach. 7M

**OR**

6. a) 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). 8M

   b) Briefly explain Hamiltonian cycles using backtracking. 6M

**UNIT–IV**

7. a) What are connected and bi-connected components? Explain with suitable example. 7M

   b) Write a Program schema for a LIFO branch and bound search for Least-cost answer node. 7M

**OR**

8. a) Write a short note on spanning trees. 5M

   b) Draw the portion of state space tree generated by LCKNAP for the Knapsack instances: n=5,
   (P1, P2,…..P5) = (10, 15, 6, 8, 4) , (W1, W2,….W5) = (4, 6, 3, 4, 2) and
   M = 12. 9M

**UNIT–V**

9. a) How are P and NP problems related? 7M

   b) Explain the differences between decision and optimization problems. 7M

**OR**

10. a) Write the properties of NP-Complete and NP-Hard Problems 7M

    b) State Cook's theorem and explain its importance. 7M

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| Hall Ticket Number : | | | | | | | | | | |
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**R-14**

**Code: 4G357**

*III B.Tech. I Semester Supplementary Examinations May 2017*

# Microprocessors and Interfacing

( 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) Distinguish minimum and maximum mode concept in 8086µP. 6M
   b) Explain about maximum mode of operation in 8086 µP. 8M

**OR**

2. a) What is the purpose of instruction stream byte queue in 8086? 6M
   b) Discuss about segmentation memory concept in 8086 µP. 8M

**UNIT–II**

3. a) Describe 8255 PPI mode2 operation with an example. 8M
   b) Distinguish SRAM & DRAM 6M

**OR**

4. a) Illustrate the block diagram of 8255 PPI and explain its features. 8M
   b) Describe the control word format of 8255 for different modes. 6M

**UNIT–III**

5. a) What is DMA? Explain about Master and Slave mode concept. 9M
   b) Illustrate the block diagram of 8257 DMA controller. 5M

**OR**

6. a) What is meant by interrupt driven I/O? 4M
   b) Describe 8259 PIC architecture. 10M

**UNIT–IV**

7. a) Describe the architectural features of 8251 USART. 8M
   b) Distinguish asynchronous and synchronous data transfer schemes. 6M

**OR**

8. a) Explain how TTL to RS232C and RS232C to TTL conversion is possible? 7M
   b) Distinguish asynchronous and synchronous data transfer schemes. 7M

**UNIT–V**

9. a) List out the salient features of Pentium processors 4M
   b) Distinguish the architectural features of 80286 and 80386 µPs. 10M

**OR**

10. a) Explain the concept of real and protected mode segmentation 10M
    b) Describe the features of paging mechanism. 4M

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**R-14**

**Code: 4G152**

*III B.Tech. I Semester Supplementary Examinations May 2017*

# Operating 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) Explain operating system services and systems calls. 7M
   b) Discuss types of operating systems. 7M

**OR**

2. a) Explain states of process with neat sketch and discuss the process state transition with a neat diagram. 7M
   b) Define thread. Differentiate user threads form kernel threads. 7M

**UNIT–II**

3. a) Explain Peterson's Solution. 7M
   b) Explain atomic transactions. 7M

**OR**

4. a) Explain Deadlock handling methods. 7M
   b) Explain Banker's deadlock-avoidance algorithm with an illustration. 7M

**UNIT–III**

5. a) Explain memory management without swapping. 7M
   b) Explain about contiguous memory allocation with neat diagram. 7M

**OR**

6. a) Explain the services provided by a kernel I/O subsystem. 7M
   b) Explain FIFO page replacement algorithm. 7M

**UNIT–IV**

7. a) Explain the two-level directory and three-level directory structure. 7M
   b) Explain file allocation methods 7M

**OR**

8. a) Explain and compare the C-LOOK and C-SCAN disk scheduling algorithms. 7M
   b) Explain Tertiary storage structure. 7M

**UNIT–V**

9. a) Explain protection mechanism. 7M
   b) What is meant by Access control. Explain Revocation of Access Rights. 7M

**OR**

10. a) Describe firewalling to protect systems and networks. 7M
    b) Explain Computer security classification. 7M

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