

**G. H. Raisoni College of Engineering, Nagpur**

(An Autonomous Institute)

**Sixth Semester B. E. (Computer Science & Engineering / Information Technology)****End Semester Examination Summer – 2017****Language Processors****Time: 3 hrs.]****[Max. Marks: 60****Instructions to Candidates:**

- 1) [CO-1/CO-2/CO-3 ...] at the beginning of question/sub-question indicates the course outcome related to the question.
- 2) All questions carry marks as indicated.
- 3) Assume suitable data wherever necessary.

1. Solve
  - (a) [CO-1] Write SDTS to count number of left and right parenthesis 2
  - (b) [CO-3] Write an SDTS for the repeat-until Statement 2
  - (c) [CO-2] What is handle pruning? 2
  - (d) [CO-4] Define L-attribute & S-attribute 2
  - (e) [CO-5] What is loop jamming and loop unrolling 2
  - (f) [CO-5] What is meant by reducible flow graph 2
2. (a) [CO-2] Construct LL (1) parsing table for the following grammar 4
 

$S \rightarrow aBDH$   
 $B \rightarrow Bb \mid c$   
 $D \rightarrow EF$   
 $E \rightarrow g \mid \epsilon$   
 $F \rightarrow f \mid \epsilon$
- (b) [CO-2] Obtain CLR parsing table for the grammar and show the stack buffer content for string "cdd" 5
 

$S \rightarrow CC$   
 $C \rightarrow cC \mid d$
3. (a) [CO-3] Consider the following expression not ( $P < Q$  and  $R < S$  or not ( $T < V$  and  $R < Q$ )) write suitable grammar, translation scheme, three address code and annotated parse tree 5
- (b) [CO-3] Write ten different representations of three Address code. 4
4. (a) [CO-4] Explain automatic error recovery in YACC. 5
- (b) [CO-4] Describe the data structure for symbol table and compare them. 5
5. (a) Explain the different phases of compilers 5
- (b) Discuss the different problems encounters in the code generation phase. 5
6. Solve Any Two (Write a short note on)
  - (a) [CO-6] GCC compiler structure 5
  - (b) [CO-6] Elimination of induction variable 5
  - (c) [CO-6] Peephole Optimization 5

**G. H. Raisoni College of Engineering, Nagpur**  
(An Autonomous Institute)  
**Sixth Semester B. E. (Computer Science & Engineering)**  
End Semester Examination Summer -2017

**Parallel & Distributed Computing**

**Time: 3 hrs.]**

**[Max. Marks: 60**

**Instructions to Candidates:**

- 1) [CO-1/CO-2/CO-3 ...] at the beginning of question/sub-question indicates the course outcome related to the question.
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- 3) Assume suitable data wherever necessary.
- 4) Due credit will be given to neatness and adequate dimensions.
- 5) Illustrate your answer wherever necessary with the help of neat sketches.

1. Answer the following questions with justification 2
  - (a) [CO-1] A collection of lines that connects several devices is called as 2  
i) Bus ii) Peripheral connection wires iii) Both i & ii iv) Internal wires
  - (b) [CO-1] Data hazards occurs when \_\_\_\_\_ 2  
i) Greater Performance loss ii) Pipeline changes the order of read/write access to operands  
iii) Some functional Unit is not fully pipelined iv) Machine size is limited
  - (c) [CO-1] In super scalar processor, \_\_\_\_\_ mode of execution is used 2  
i) Out of order ii) Post order iii) In-order iv) None of the mentioned
  - (d) [CO-1] \_\_\_\_\_ is a common issue when using multiple level of memory. 2  
i) Memory latency ii) Read Update iii) Cache coherency iv) All of these
  - (e) [CO-1] Which routing technique used in distributes system? 2  
i) Fixed Routing ii) Virtual routing iii) Dynamic routing iv) All of these
  - (f) [CO-2] various mechanisms such as \_\_\_\_\_ may be used to control access to the shared memory 2  
i) Locks ii) Semaphore iii) Both i & ii iv) None of these
2. (a) [CO-4] Find out dependencies in following code with the help of dependency graph. 6  

S1: Load R1, A  
S2: Add R2, R1  
S3: Move R1, R3  
S4: Store B, R1
- (b) [CO-3] Discuss the significance of Grain Packing in parallel processing with the help of suitable example 6
3. (a) [CO-3] What are the different types of dependencies exists in parallel processing. Explain each with the suitable example. 6
- (b) [CO-4] Explain the taxonomy of parallel processor architecture 6
4. Solve Any Two
  - (a) [CO-5] How to handle cache coherence in multi Processor system 6
  - (b) [CO-2] Describe UMA, NUMA, COMA related with shared memory architecture 6
  - (c) [CO-1] How to simulate multiple accesses on an EREW PRAM model? Explain with example 6
5. Solve Any Two
  - (a) [CO-5] List OpenMP key features and illustrate general code structure of OpenMP. 6
  - (b) [CO-3] Differentiate between the Blocking versus non-blocking communication in MPI. How non-blocking communication can be used to improve performance. 6
  - (c) [CO-3] Briefly describe all parallel programming model exist for parallel processing. 6
  - (c) [CO-5] Write on open mp Program to implement the sections directive? 6

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**Fourth Term / Sixth Semester B. E. (Computer Science & Engineering)**

End Semester Examination Summer – 2017

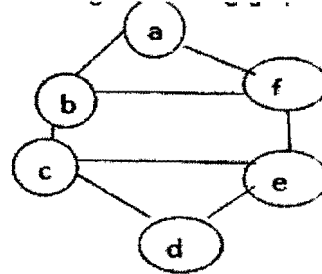
**Design & Analysis of Algorithm****Time: 3 hrs.]****[Max. Marks: 60****Instructions to Candidates:**

- 1) [CO-1/CO-2/CO-3 ...] at the beginning of question/sub-question indicates the course outcome related to the question.
- 2) All questions carry marks as indicated.
- 3) Assume suitable data wherever necessary.
- 4) Due credit will be given to neatness and adequate dimensions.

1. (a) [CO-1] State different asymptotic notations. 2
- (b) [CO-2] Find the order of function  $g(n)=6n^2 + n + 1$  2
- (c) [CO-1] Solve recurrence using Masters Method: 2
 
$$T(n) = \begin{cases} 4T(n/2) + n & n > 1 \\ =1 & n = 1 \end{cases}$$
- (d) [CO-1] Differentiate between primsand kruskal algorithms. 2
- (e) [CO-2] What is principal of optimality? State its importance in brief. 2
- (f) [CO-3] Write a recurrence equation for solving multistage graph using forward approach. 2
2. (a) [CO-2] Write algorithm for searching an item in binary search tree 3
- (b) [CO-2] Find the best possible sequence for the following deadlines .also write algorithm and state its time complexity. 4
 

|          |    |    |    |    |    |    |   |
|----------|----|----|----|----|----|----|---|
| Job      | 1  | 2  | 3  | 4  | 5  | 6  | 7 |
| Profit   | 35 | 20 | 18 | 16 | 12 | 10 | 8 |
| Deadline | 3  | 1  | 3  | 4  | 2  | 2  | 1 |
- (c) [CO-4] What is optimal Huffman code for following set of frequencies. 5  
A:05, B:07,C:10,F:13,D:17,E:10,F:13
3. (a) [CO-3] What is Longest common subsequence problem? State its recurrence equation. 5  
Implement LCS for following sequence  
X=<A,B,C,B,D,A,B>  
Y=<B,D,C,A,B,A>
- (b) [CO-3] Explain, lower bound complexity of any sorting method, which perform sorting by comparison is  $n \log n$ ? 3
- (c) [CO-3] Write algorithm to find minimum and maximum value from the collection by using divide and conquer strategy. 4

4. (a) [CO-4] What is planer graph? Implement graph coloring on following graph and generate solution space tree. 6



OR

- (b) [CO-5] Find optimal solution to knapsack instance  $n=7$ ,  $m=15$ ,  
 $(p_1, p_2, \dots, p_7) = (10, 5, 15, 7, 6, 18, 3)$   
 $(w_1, w_2, \dots, w_7) = (2, 3, 5, 7, 1, 4, 1)$  6
- (c) [CO5-] What is multistage graph? Write backward algorithm to solve multistage graph problem. 6
5. (a) [CO-5] What is TSP? Implement TSP for following matrix representing complete graph. 6

|   |    |    |    |
|---|----|----|----|
| 0 | 10 | 15 | 20 |
| 5 | 0  | 9  | 10 |
| 6 | 13 | 0  | 12 |
| 8 | 8  | 9  | 0  |

- (b) [CO-5] Write algorithm to solve n-queen problem. Explain implicit and explicit constraint associated with 8 queen problem. Give at least two solutions for 8 queen problem. 6

OR

- (b) [CO-6] Explain P, NP, NPC and NPH classes of algorithm 6

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**Fourth Term / Sixth Semester B. E. (Computer Science & Engineering)**

End Semester Examination Summer – 2017

**Embedded Systems****Time: 3 hrs.]****[Max. Marks: 60****Instructions to Candidates:**

- 1) [CO-1/CO-2/CO-3 ...] at the beginning of question/sub-question indicates the course outcome related to the question.
- 2) All questions carry marks as indicated.
- 3) Assume suitable data wherever necessary.
- 4) Due credit will be given to neatness and adequate dimensions.
- 5) Illustrate your answer wherever necessary with the help of neat sketches.

1. (a) [CO-1] Differentiate between Microprocessors and Micro-controllers 2
- (b) [CO-1] Compare between CISC v/s RISC 2
- (c) [CO-2] Draw and Explain PSW (Program Status Word) register of 8051 2
- (d) [CO-4] Describe features of PIC microcontroller 2
- (e) [CO-5] State the features of ARM instruction set. 2
- (f) [CO-2] Describe the use of address bus, data bus and control bus of microcontroller. 2
2. (a) [CO-1] Differentiate between Harvard v/s Van Neumann architecture. 2
- (b) [CO-1] Define Embedded systems. Describe various characteristics and applications of embedded system. 5
- (c) [CO-1] Draw and explain block diagram of 8051 microcontroller. 5
3. (a) [CO-2] Illustrate the various addressing modes used in 8051 with examples 6
- (b) [CO-2] Write a 8051 assembly program to read the temperature connected to port P1 and test it for the value 75. According to the test results, place the temperature value into the registers. Indicated by the following. 6
 

If T = 75 then A = 75  
If T < 75 then R1 = T  
If T > 75 then R2 = T
4. (a) [CO-2] Draw and explain TMOD register format of 8051 3
- (b) [CO-2] Write a program for the 8051 to transfer letter "A" serially at 4800 baud, continuously 4
- (c) [CO-4] Draw & Describe PIC – architecture in detail. 5
5. (a) [CO-5] Describe in detail architecture of ARM7 processor with block diagram. 6
- OR**
- (b) [CO-5] Illustrate ARM registers organization with detailed explanation. 6
- (c) [CO-6] Describe RS232 and I2C buses in embedded systems. 6
- OR**
- (d) [CO-3] Interface LCD to 8051 and display "GHRCE" message on it. 6

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**Sixth Semester B. E. (Master of Technology Management 5 ½ Years Course)****End Semester Examination Summer – 2017****Creativity and Innovation****Time: 3 hrs.]****[Max. Marks: 60****Instructions to Candidates:**

- 1) All questions carry marks as indicated.
- 2) Due credit will be given to neatness and adequate dimensions.
- 3) Illustrate your answer wherever necessary with the help of neat sketches.

1. Mark True or False statement with reasons to support your answer. 12
  - (a) Expertise, Creativity thinking Skills & Motivation are the three components of Creativity. (True/False)
  - (b) Brainstorming is a group or individual creativity technique. (True/False)
  - (c) Morphological analysis was first applied to the aerospace industry by F. Zwicky (True/False)
  - (d) The process of translating an idea or invention into goods or services creates value (True/False)
  - (e) Radiant Thinking is the underlying theory and philosophy behind Mind Mapping. (True/False)
  - (f) Lateral thinking is a sub category of Creative Thinking (True/False)
2. Define Creativity & Innovation. State the types of Thinking Style. 8
3. With the help of an example explain SCAMPER technique. 8
4. What is Question Checklist? Explain Delphi Method in brief. 8
5. What is Creative Problem Solving Approach? Explain the process of Creative Problem Solving. 8
6. (a) Discuss Creativity and its importance in Business. 8

**OR**

- (b) Define Brain Storming. Explain the procedure for brain storming. 8
- 7. (a) What is Morphological Analysis? Discuss the Advantages and Disadvantages of Morphological Analysis. 8

**OR**

- (b) Describe Service Creativity and Strategic Creativity in your word. 8