G. H. Raisoni College of Engineering, Nagpur

A

(An Autonomous Institute under UGC Act 1956)
Third Semester B. E. (Computer Science & Engineering / Information Technology)
End Semester Examination Winter - 2014

Computer Architecture and Organization

Time: 3 hrs.]   [Max. Marks: 60

Instructions to Candidates:
1) All questions carry marks as indicated.
2) All questions are compulsory.
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)	Solve A=B+C using Three Address Instruction Format	2
	(b)	Apply sign extension for total 8bit value on **i)**10010 **ii)**011001	2
	(c)	Draw Diagram of Daisy Chain Interrupt	2
	(d)	What is the use of Memory Controller?	2
	(e)	Describe Flynn's Classification of computer architecture.	2
	(f)	State the phases of Pipelining	2
2.	(a)	Describe Hardwired Control Method with help of example as Z=T1.T2+T3	8
	(b)	What are the types of Hazards that cause performance degradation in pipelined processors?	4
3.	(a)	What do you mean by Addressing Mode? State and explain the different Addressing Modes with example of each	6
	(b)	Explain the concept of Bus Arbitration.	6
4.	(a)	Solve and Explain Booth Algorithm for 8 X - 4	6
	(b)	Differentiate Between i) Synchronous and Asynchronous Bus ii) Interrupt and Subroutine	6
5.	(a)	Explain working of Carry-look ahead adder. Also explain generate and propagate function with diagram.	12

OR

	(b)	Explain the principle of Cache memory? Explain any one mapping technique of cache memory.	12

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution under UGC act 1956)

Third Semester B.E. (Computer Science & Engineering)

End Semester Examination Winter - 2014

Principles of Management

Time: 3hr.]   [Max. Marks: 60

Instruction to Candidate:
1) All questions carry marks as indicated.
2) Assume suitable data wherever necessary.
3) Due credit will be given to neatness and use of appropriate Terminology.
4) Illustrate your answer wherever necessary with the help of neat diagram.

1. (a) Planning is done for?   2
        i. Past   ii. Present   iii. Future   iv. None

    (b) MIS stands for?   2
        i. Management Informatics System   ii. Management Information System
        iii. Management Internal System   iv. Management Internal Selection

    (c) Marketing management is NOT related to?   2
        i. Sales   ii. Advertisement   iii. Sales promotion   iv. Production

    (d) Issue of shares are _____ sources of finance?   2
        i. Short term   ii. Medium term   iii. Long term   iv. Very short term

    (e) In human resource management training is given to?   2
        i. Employer   ii. Employee   iii. Management   iv. Shareholders

    (f) OB stands for?   2
        i. Organisation behaviour   ii. Organisation balance
        iii. Organisation betterment   iv. Organisation best

2. (a) Explain importance of decision making and its type.   8
                                        OR
    (b) `Explain characteristics of good planning.   8

3.   Elaborate management information system and its conceptual foundation.   8

4.   Explain in detail market segmentation.   8

5.   Explain the goals and objectives of financial management.   8

6. (a) Explain recruitment and selection under human resource management.   8
                                        OR
    (b) Explain how job stress can be managed.   8

7.   Explain traditional & modern techniques of control.   8

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution under UGC act 1956)

Third Semester B. E. (Computer Science & Engineering / Information Technology /

Electronics Engineering / Electronics & Telecommunication Engineering)

End Semester Examination Winter - 2014

Data Structures using C

Time: 3 hrs.]   [Max. Marks: 60

Instructions to Candidate:
1) All questions carry marks as indicated.
2) Assume suitable data wherever necessary.
3) Illustrate your answer wherever necessary with the help of neat sketches.

1. (a) If a node having two children is deleted from a binary tree, it is replaced by its   1
   (i) Inorder predecessor   (ii) Inorder successor
   (iii) Preorder predecessor   (iv) None of the above

   (b) A mathematical-model with a collection of operations defined on that model is called   1
   (i) Data Structure   (ii) Abstract Data Type
   (iii) Primitive Data Type   (iv) Algorithm

   (c) The postfix form of the expression   2
   (A+ B)*(C*D- E)*F / G is
   (i) AB+ CD*E - FG /**   (ii) AB + CD* E - F **G /
   (iii) AB + CD* E - *F *G /   (iv) AB + CDE * - * F *G /

   (d) For an undirected graph with n vertices and e edges, the sum of the degree of each vertex is   1
   equal to
   (i) 2n   (ii) (2n-1)/2   (iii) 2e   (iv) e2/2

   (e) In a circular linked list   1
   (i) components are all linked together in some sequential manner.
   (ii) there is no beginning and no end.
   (iii) components are arranged hierarchically.
   (iv) forward and backward traversal within the list is permitted.

   (f) The data structure required for Breadth First Traversal on a graph is   1
   (i) queue   (ii) stack   (iii) array   (iv) tree

   (g) A characteristic of the data that binary search uses but the linear search ignores is the____.   1
   (i) Order of the elements of the list.   (ii) Length of the list.
   (iii) Maximum value in list.   (iv) Type of elements of the list

   (h) If h is any hashing function and is used to hash n keys in to a table of size m,where n<=m, the   2
   expected number of collisions involving a particular key x is :
   (i) less than 1.   (ii) less than n.
   (iii) less than m.   (iv) less than n/2.

   (i) The number of interchanges required to sort 5, 1, 6, 2 4 in ascending order using Bubble Sort is   2
   (i) 6   (ii) 5   (iii) 7   (iv) 8

2. (a) Write a program to insert an element in Circular linked list which can inserts the value at any 8 position. Assume that linked list is already created

OR

(b) Explain two dimensional array and write a program for matrix multiplication. 8

3. Two stacks STACK1 and STACK2 are implemented using single array. STACK1 and 8 STACK2 are arranged alternately starting from index 0 (Zero), write a program that will insert odd element in STACK1 and even element in STACK2.

4. (a) Draw a tree from given inorder and preorder traversal of a Binary tree. 4
INORDER:- H D I B J E K A F C G
PREODER:- A B D H I E J K C F G

(b) Suppose graph of n vertices is stored in a memory by using adjacency matrix. Write a function 4 to compute indegree and outdegree of a vertex of a graph.

5. (a) Explain AVL tree with example. 6

(b) Explain topological sorting. 2

6. Write a Algorithm to sort an array by using Quick sort with example. 8

7. Write an algorithm for Binary Search. Also analyze the algorithm with an example. 8

G. H. Raisoni College of Engineering, Nagpur
(An Autonomous Institution under UGC Act 1956)
Third Semester B.E. (Computer Science & Engineering)
End Semester Examination Winter - 2014
Microprocessor Based Systems

Time: 3 hrs]   [Max Marks: 60

Instructions to Candidates:
1) Assume suitable data wherever necessary.
2) Illustrate your answers wherever necessary with the help of neat sketches.
3) Due credits will be given to neatness and adequate dimensions.

1. (a) Explain with example how physical address is formed in 8086.   2

    (b) Difference between Maximum and Minimum mode of 8086.   2

    (c) Explain the PUSH and POP instructions of 8086.   2

    (d) Which is the addressing mode for following instruction.   2
         Mov Ax, 2000H
         i) Direct   ii) Immediate   iii) Register   (iv) Implicit

    (e) Explain DAA instruction in detail.   2

    (f) Form the control word for the following configurations of the port of 8255 for mode 0 operation.   2

         Port A-Input, Port B-Output, Port C lower-Output, Port C upper- Input.

2.   Solve **Any Two**

    (a) Explain Memory segmentation in 8086 with its advantages.   5

    (b) Write 8086 ALP that will generate a Fibonacci series.   5

    (c) What is meant by assembler directives? Explain any four assembler Directives associated   5
         with 8086.

3.   Solve **Any Two**

    (a) Write an 8086 ALP to add two 3*3 matrices of 8-bit integers.   5

    (b) Draw and discuss flag register of 8086 in brief.   5

    (c) Write an 8086 ALP to find largest number from given string of 10 bytes data.   5

4.   Solve **Any Two**

    (a) Draw and explain interconnection of 8086 with 8087.   5

    (b) Write a short note on 8288 bus controller.   5

    (c) Write 8086-8087 program to find area of circle. The area of circle is given by $A=\pi R^2$.   5

5.   Solve **Any Two**

(a)   Interface an 8-bit DAC with 8086 using 8255 and write a program to generate Triangular   5
waves of frequency 8 KHz (T= 0.125ms). Port A address is 50H.

(b)   Draw & explain architecture of 8253   . 5

(c)   Explain I/O mode and BSR mode of 8255.   5

6.   Write short note on following. (**Any Two**)

(a)   Real and Protected mode of 80386.   4

(b)   Explain paging technique used in 80386 or 2 level paging.   4

(c)   Write short note on 8251 USART.   4

G. H. Raisoni College of Engineering, Nagpur.
(An Autonomous Institution under UGC act 1956)
Third Semester B.E. (Computer Science & Engineering / Information Technology)
End Semester Examination Winter - 2014
Applied Mathematics - III

Time: 3 Hrs.]   [Max marks: 60

Instructions to the Candidates:

1. All Questions are compulsory.
2. Assume suitable data wherever necessary.
2. Use of non-programmable calculator is permitted.
3. All questions carry marks as indicated.

1. (a) State convolution theorem of (Inverse Laplace Transform)   2

   (b) Find $Z\{n\}$ 2

   (c) Define Fourier Sine Transform of f(x) and inverse Fourier sine transform.   2

   (d) Find the constant c such that the function $f(x) = \begin{cases} cx^2, 0 < x < 3 \\ 0, otherwise \end{cases}$ is a density function.   2

   (e) Find the probability of getting between 3 and 6 heads exclusive in 10 tosses of a fair coin by using the binomial distribution.   2

   (f) Solve $p\sqrt{x} + q\sqrt{y} = \sqrt{z}$ 2

2.   Solve **Any Two**

   (a) Express following function in terms of unit step function and find their Laplace   6

   transform $f(t) = \begin{cases} \cos t, 0 < t < \pi \\ \cos 2t, \pi < t < 2\pi \\ \cos 3t, t > 2\pi \end{cases}$

   (b) If $L\{f(t)\} = \overline{f(s)}$, then prove that $L\left\{\dfrac{f(t)}{t}\right\} = \int_s^\infty \overline{f(s)}ds$ and hence find $L\left\{\dfrac{\sin t}{t}\right\}$ 6

   (c) Find the Fourier sine transform of $e^{-|x|}$ and hence show that   6

   $\int_0^\infty \dfrac{x\sin mx}{1+x^2}dx = \dfrac{\pi}{2}e^{-m}, m > 0$

3. **Solve Any Two**

(a) If $Z\{f_n\} = F(z)$ then prove that $Z\{f(n+k)\} = z^k[F(z) - \sum_{i=0}^{k-1} f(i)z^{-i}]$, k>0   6

(b) The joint probability function of two discrete random variables X and Y is given by   6

$$f(x,y) = \begin{cases} C(2x+y), 0 \le x \le 2, 0 \le y \le 3 \\ 0, otherwise \end{cases}$$

Find i)Constant C ii) $P(X \ge 1, Y \le 2)$ iii) marginal probability functions of X and Y. Also determine whether X and Y are independent.

(c) If the probability that an individual will suffer a bad reaction from injection of a given   6
serum is 0.001, determine the probability that out of 2000 individuals, a) exactly 3, b) More than 2 will suffer a bad reaction.

4. (a) If 20% of bolts produced by a machine are defective, determine the probability that   4
out of 4 bolts chosen at random, a) 1, b) 0, c) less than 2, bolts will be defective.

(b) Solve $\dfrac{\partial^3 z}{\partial x^3} - 7\dfrac{\partial^3 z}{\partial x \partial y^2} + 6\dfrac{\partial^3 z}{\partial y^3} = \sin(x+2y)$ 4

5. **Solve Any Two**

(a) Find inverse Laplace transform of $\{\dfrac{s}{(s^2+a^2)^2}\}$ 4

(b) Solve $x^2\dfrac{\partial^2 z}{\partial x \partial y} + 3y^2 z = 0$ using the method of separation of variables.   4

(c) Show that $\dfrac{1}{n!} * \dfrac{1}{n!} = \dfrac{2^n}{n!}$ 4

6. **Solve Any Two**

(a) Solve the integral equation $\int_0^\infty f(x)\cos \lambda x\, dx = e^{-\lambda}, \lambda > 0$ 4

(b) Find the first four moments about the origin for a random variable X having density   4
function $f(x) = \begin{cases} \dfrac{4x(9-x^2)}{81} & 0 \le x \le 3 \\ 0 & otherwise \end{cases}$

(c) Obtain half range cosine series for f(x)=2x-1, in the interval 0<x<1.   4

G. H. Raisoni College of Engineering, Nagpur
(An Autonomous Institution under UGC act 1956)
Third Semester B. E. (Master of Technology Management 5$^1/_2$ Years Course)
(Computer Science & Engineering)
End Semester Examination Winter - 2014

Engineering Economics

Time: 3 hr.]   [Max. Marks: 60

Instructions to Candidate:
1) All questions carry marks as indicated.
2) All questions are compulsory.
3) Due credit will be given to neatness and adequate dimensions.
4) 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) Different Indifference curves in an Indifference map have same satisfaction (True / False)
level.

   (b) Large number of buyers and sellers in Oligopoly market.   (True / False)

   (c) Issue of Currency notes is function of Central bank.   (True / False)

   (d) Motivation is important part of organizing function in management.   (True / False)

   (e) Selling is integral part of a Marketing program.   (True / False)

   (f) Discounting is a tool for Sales promotion.   (True / False)

2. Discuss Price Elasticity of demand with example.   8

3. What is Monopolistic competition and Oligopoly?   8

4. What is Inflation and what are its types. Discuss them in detail.   8

5. What are Principles of Management?   8

6. (a) What do you understand by Advertising and Sales Promotion. Illustrate with   8
examples.
OR
   (b) Explain the 4P's of Marketing in detail.   8

7. (a) What are functions of a Manager in an organization? Explain.   8
OR
   (b) What are Direct and Indirect Taxes? Discuss them in detail.   8

G. H. Raisoni College of Engineering, Nagpur
(An Autonomous Institution under UGC act 1956)
Third Semester B. E. (Computer Science & Engineering/ Information Technology)
Vacation Examination Winter - 2014   H

Computer Architecture & Organization

Time: 3 hr.]   [Max. Marks: 60

Instructions to Candidate:
1) All questions are compulsory.
2) Assume suitable data wherever necessary.
3) Due credit will be given to neatness and adequate dimensions.
4) Illustrate your answer wherever necessary with the help of neat sketches.

1. (a) What are the different functional units of a basic computer system?   2

   (b) The number 100110_2 is numerically equivalent to   2

   (i) 26_{10} (ii) 36_{10} (iii) 46_8 (iv) $2A2_{16}$

   (c) In a 4 bit carry look ahead adder, the addition process requires only   2

   (i) 3 gate delay   (ii) 1 XOR gate delay   (iii) 4 gate delay   (iv) 2 gate delay

   (d) Explain briefly the operation of Add LOCA, R0.   2

   (e) Explain multiple bus organization.   2

   (f) Explain the difference between cache Memory and Virtual Memory.   2

2. (a) Explain the different addressing modes and how it is helpful in   6
   implementation of pointers and arrays.

   (b) Explain the execution of instruction using simple processor model. Also give   6
   suitable examples in each operation

3. Solve **Any Two**

   (a) Discuss the principle of operation of carry-look ahead adders.   6

   (b) Discuss the various mapping techniques used in cache memories.   6

   (c) Solve the multiplication by using Booth's algorithm and also explain it: 6
   Multiply 0101101 with 0011110.

4. (a) Write Short note on **Any Two**:   6
      i. Magnetic disk
      ii. Direct Memory Access
      iii. Parallel Processing

   (b) How does bus arbitration typically works? Explain in detail.   6

5. (a) Explain the concept of pipelining and how it helps in improving the   6
   performance of system.

   (b) Discuss the various hazards that might arise in a pipeline. What are the   6
   remedies commonly adopted to overcome/minimize these hazards.

BHUL 201

G. H. Raisoni College of Engineering, Nagpur
(An Autonomous Institute under UGC Act 1956)   I
Third Semester B.E. (Computer Science & Engineering)
Vacation Examination Winter - 2014
Principles of Management

Time: 3 hr.]   [Max. Marks: 60
Instructions to Candidate:
1. All questions are compulsory & carry marks as indicated
2. Assume suitable data wherever necessary.
3. Due credit will be given to neatness and adequate dimensions.
4. Illustrate your answer wherever necessary with the help of neat sketches.

1.   **State true and false with reason:**

   (a)   The marketers can divide the market into smaller segments based on age & gender.   2

   (b)   Every business organization needs finance to carry out its activities and achieve its   2
      objective

   (c)   Planning bridges the gap between where we are and where we want to go.   2

   (d)   HRM is used only in industrial organisation.   2

   (e)   Properly designed organization structure can help in improving team work and   2
      productivity

   (f)   The foundation of MIS is the principles of management and if its practices.   2

2.   (a)   Explain the different function of management   8
                             OR
    (b)   What is planning? Explain the benefit and limitation of Planning   8

3.   State the importance of Management Information system   8

4.   (a)   Explain Marketing Mix in detail   8
                            OR
    (b)   Discuss different pricing strategies in marketing management   8

5.   Write short notes on Ratio analysis   8

6.   Write a note on Recruitment and Selection   8

7.   Write short note on Organisation Structure   8

G. H. Raisoni College of Engineering, Nagpur

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Third Semester B. E. (Computer Science & Engineering / Information Technology / Electronics Engineering / Electronics & Telecommunication Engineering)

Vacation Examination Winter - 2014

Data Structure Using C

Time: Three hour]   [Max. Marks: 60

Instructions to Candidate:

1) All questions carry marks as indicated.
2) All questions are compulsary
3) Assume suitable data wherever necessary.

1. (a) What is linear and non linear data structure?   2

    (b) What is front and rear of queue?   2

    (c) What is garbage collection?   2

    (d) Write down applications of queue.   2

    (e) Define path and cycle in trees.   2

    (f) Define AVL trees.   2

2. (a) Define Sparse Matrix. How it is represented in memory.   4

    (b) Explain how two dimensional array is represented in memory and write a C function   6
         to sort a matrix row wise and column wise. Assume that matrix is represented by two
         dimensional array.

3. (a) Explain the concept of Doubly linked list with example.   5

    (b) Write short note on buddy system.   5

4. (a) Convert the given Infix expression to Postfix expression using Stack and show the   8
         details of Stack at each step of conversion. Expression: (a + b * c ^ d) * (e + f / g).
         Note : ^indicates exponent operator.

OR

    (a) Write an algorithm to insert new node at the beginning, at middle position and at the   8
         end of a Singly Linked List

    (b) What is worst case complexity of quick sort.   2

5. (a) Describe different types of trees with neat diagram.   5

    (b) Write a C program to implement binary tree.   5

6. Write an algorithm for Breadth first search. Explain it with example.   8

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution under UGC act 1956)
Third Semester B.E. (Computer Science Engineering/Information Technology)
Vacation Examination Winter - 2014

Applied Mathematics III

Time: 3 hrs.]   **[Max. Marks: 60**

Instructions to Candidates:
1) All Questions are compulsory.
2) Assume suitable data wherever necessary.
3) Use of non-programmable calculator is permitted.
4) All questions carry marks as indicated.

1.   Solve all the following given questions

   (a)   Find $L\{te^{-2t}\}$ 2

   (b)   Find $Z\left\{a^n \cos n\dfrac{\pi}{2}\right\}$ 2

   (c)   Define Fourier series expansion of f(x) for interval $0 \le x \le 2\pi$.   2

   (d)   Define Probability Function and Distribution Function for Discrete random Variable.   2

   (e)   Find the probability that in a family of 4 children there will be 1 boy.   2

   (f)   Solve $(D^2+2DD'-8D'^2)z=0$ 2

2.   **Solve any TWO**

   (a)   Solve $\dfrac{d^2y}{dt^2} + 2\dfrac{dy}{dt} - 3y = e^{-t}$,y(0) = 0, y'(0)=0 by using Laplace Transform   6

   (b)   State convolution theorem of Laplace transform and use it to find $L^{-1}\{\dfrac{1}{s^2(s^2+1)}\}$.   6

   (c)   In a certain factory producing cycle tyers, there is a small chance of 1 in 500 tyres to be defective .The tyres are supplied in lots of 10.Using Poission distribution, calculate the approximate number of lots containing no defective,1 defective and two defective tyres, respectively in a consignment of 10,000 lots.   6

3.   **Solve any TWO**

   (a)   If Z{f(n)} = F(z) then prove that $Z\{nf(n)\} = -z\dfrac{d}{dz}F(z)$ and hence find Z{n}   6

   (b)   Obtain half range cosine series for f(x)=2x-1, in interval 0<x<1.Hence show that   6

$$\frac{\pi^2}{8} = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + -----$$

   (c)   Solve by using Method of separation of variables $\dfrac{\partial u}{\partial x} = 4\dfrac{\partial u}{\partial y}$,given $u(0,y) = 8e^{-3y}$ 6

4. **Solve any TWO**

(a) A random variable X has the density function $f(x) = \begin{cases} ke^{-3x}, & x > 0 \\ 0, & x \le 0 \end{cases}$

Find constant k and P (1<x<3)

4

(b) Suppose that two dice are tossed. Let random variable X denotes the sum of the points. Obtain the probability function for X and distribution function for X.

4

(c) Ten percent of screws produced in a certain factory turn out to be defective. Find the probability that in a sample of 10 screws chosen at random , exactly two will be defective.

4

5. **Solve any TWO**

(a) Find Z{sin(3n+5)}

4

(b) Find the Fourier sine transform of $f(x) = \dfrac{e^{-ax}}{x}$, a>0

4

(c) The joint probability function of two discrete random variable X and Y is given

$f(x) = \begin{cases} C(x+2y) & for \quad x = 0,1,2 \ and \ y = 0,1,2 \\ 0 & otherise \end{cases}$

Find   i) constant C   ii) marginal distribution functions of X and Y

4

6. (a) Solve $\dfrac{\partial^3 z}{\partial x^3} - 2\dfrac{\partial^3 z}{\partial x^2 \partial y} = 2e^{2x}$

4

(b) Solve $y^2 p - xyq = x(z-2y)$

4