PURBANCHAL UNIVERSITY

Time-bound Home Exam 2020

Bachelor in Information Technology (B.I.T.)/Third Semester/*Final*

Time: 03:00 hrs. (+2 Hrs. for Submission) Full Marks: 80 /Pass Marks: 32

BIT273CO: Data Structure & Algorithm *(New Course)*

Instructions:

Dear Students!

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Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. What are different types of graph? Explain different graph traversal methods with example. 4+8

2(a) What is linked list? Discuss about the difference types of linked lists with example. 2+2

(b) Write algorithm to insert a new node in a singly linked list at: 4+4

(i) First position of the singly linked list.

(ii) End position of the singly linked list.

3. Explain tree with its types. Explain different binary tree traversal algorithms with example. 4+8

Group B

Answer SEVEN questions. **7×8=56**

4. Explain stack and its operation with example. 8

5. What is queue? Mention its types. Discuss about the operations that can be performed in a queue. 2+2+4

6. What is merge sort? Explain with an example and write the algorithm for it. 1+3+4

7. What is a spanning tree? Explain Kruskal's algorithm for developing a spanning tree with an example. 1+4+3

8. What is hash collision? Explain different collision resolution techniques. 2+6

9. Explain Dijkstra's algorithm for finding shortest path from source to destination in a graph. 8

10. What are different types of searching? Explain sequential search with example. 3+5

11. **Write short notes on any TWO:** **4+4**
    (a) AVL trees.
    (b) Abstract Datatype.
    (c) Evaluation of postfix expression.

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Time: 03:00 hrs. (+2 Hrs. for Submission) Full Marks: 80 /Pass Marks: 32

BIT275CO: User Interface Design *(New Course)*

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Group A

Answer TWO questions. **2×12=24**

1. Why are menus important in a user interface design? Explain the problems of modal dialog boxes and what are their solutions? 3+9
2. Describe canonical vocabulary in context of visual interface design. Explain features of a good interface design. 7+5
3. Describe indirect manipulation. What is selection? Differentiate between additive selection and group selection with examples. 5+2+5

Group B

Answer SEVEN questions. **7×8=56**

4. Explain entry gizmos with examples. Why is validation required in entry gizmos? 5+3
5. What is unified file model? Describe the importance of document management. 3+5
6. Discuss idea of MDI states. How would you eliminate excise tasks? 4+4
7. Distinguish between repositioning, resizing and reshaping with suitable examples. 8
8. What are toolbars? Explain the advantages of using toolbars. Define buttcons. 6+2
9. What do you mean by idiomatic paradigm? Explain why it is a step forward than metaphoric paradigm. 3+5
10. What is system menu? Explain the menu item variations. 2+6
11. **Write short notes on any TWO:** **4+4**
    (a) Display gizmos
    (b) Interoperability
    (c) Manifest model

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BIT280CO: Numerical Methods *(New Course)*

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The figures in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1(a) Define error. Discuss absolute, relative and percentage error with example. 1+5

(b) Determine the largest Eigen value and corresponding Eigen vectors for the matrix using power method. 6

$$\begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$$

2 Find the solution to three decimals, of the system: 83x + 11y - 4z = 95; 7x + 52y + 13z = 104 and 3x + 8y + 29z = 71 using (a) Jacobi Iteration Method, (b) Gauss Seidel Iteration Method and compare the results. 12

3(a) Use Bisection Method to evaluate $f(x) = x^3 + x^2 + x + 7$ for EPS = 0.05. 6

(b) Find the positive root of $x^3-x-1=0$ by Newton-Raphson method, correct to three decimal places. 6

Group B

Answer SEVEN questions. **7×8=56**

4. Compute the value of $I = \int_0^2 \frac{dx}{1 + x^2} dx$ by using Simpson's 3/8 rule with 8 stripes. 8

5. Estimate y(0.5) for the differential equation: $y'=x+\sqrt{y}$ using 4th order RK method. Take y(0) = 1 and h = 0.25. 8

6. Fit the following data for 'a' and 'b' to the LSM of type: $y=ax^b$ and find the functional value at x=7. 7+1

X	2	4	6	8	10
F(X)	4.077	11.084	30.128	81.897	222.62

7. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at x=6; for the tabulated data given below. 3+3+2

X	4.5	5.0	5.5	6.0	6.5	7.0	7.5
Y	12.25	12.33	12.41	12.50	26.37	33.34	39.15

8. Use Lagrange's method to find the functional value at X = 0.23 and 0.29 from the table below. 4+4

X	0.20	0.22	0.25	0.26	0.30
F(X)	1.6596	1.6698	1.6804	1.6912	1.7139

9. Solve the differential equation for y(2). 8

$\frac{dy}{dx} = x + y, \quad y(0) = 1$. Take h=0.2.

10. From the following table, find: f(0.21) and f(0.29), 8

X	0.20	0.22	0.24	0.26	0.28	0.30
F(X)	1.6596	1.6698	1.6804	1.6912	1.7024	1.7139

11. Write an algorithm and a program to find a functional value at a given point using Langrange's interpolation method. 8

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BIT272CO: Microprocessor & Assembly Language *(New Course)*

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Group A

Answer TWO questions. **2×12=24**

1. Draw a block diagram of 8085 microprocessor and explain function of each block briefly.
2. Draw and explain the block diagram of 8251 Programmable Communication Interface.
3. What is interrupt? Explain basic interrupt processing of 8085. Write its types.

Group B

Answer SEVEN questions. **7×8=56**

4. What is microprocessor? Explain the areas of application of microprocessor.
5. Explain the logical instructions of 8085 microprocessor. Give examples.
6. Write an assembly language program in 8085 microprocessor to multiply the two 8-bit numbers 03H and 05H, and then store the product at memory address 2030H.
7. Draw and explain the timing diagram of the instruction MOV A,B.
8. Draw the memory interfacing circuit of 8 KB RAMs with 8085 microprocessor using address decoding technique.
9. Explain addressing modes of 8086 with example.
10. Explain the operation of DMA. Describe its modes of operation briefly.
11. Write an assembly language program in 8086 microprocessor to display the string "Nepal is beautiful".

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BIT270CO: System Analysis & Design *(New Course)*

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All sketches should be well labeled.

Group A

Answer TWO questions. **2×12=24**

1. What is Software Development Life Cycle (SDLC)? What are different phases in SDLC? What is need of System Analysis? Explain the role of System Analyst. 2+6+2+2
2. What is SRS document? What are the contents of SRS document? Explain the importance of software requirement specification. 3+3+6
3. What is prototyping? Under what circumstances is it beneficial to construct a prototyping? Does the construction of a prototype always increase the overall cost of software development? Explain in your word. 3+3+6

Group B

Answer SEVEN questions. **7×8=56**

4. What is Information System? Explain how a transaction processing system works.
5. What is formal technical review (FTR)? What are the objectives of FTR?
6. Define Coupling and cohesion.
7. What is a decision table? Construct a decision table that finds the smallest among three given numbers.
8. What do you mean by system testing? Explain static, dynamic, manual and automated testing techniques.
9. What do you mean System Quality Assurance (SQA)? What are the activities involved in SQA?
10. What is system maintenance? What are the types of system maintenance? Explain in brief.
11. What is structure chart? Explain with example.