# PURBANCHAL UNIVERSITY

## 2019

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

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

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

*Candidates are required to give their answers in their own words as far as practicable.*

*Figure in the margin indicate full marks.*

## Group A

**Answer TWO questions.** **2×12=24**

1. What is adjacency matrix representation? Explain kruskals method with example. 3+9
2. Explain different tree traversal method with proper example. 12
3. Discuss the advantage of doubly linked list over singly list. Write an algorithm to insert a node in the middle of the doubly linked list. 4+8

## Group B

**Answer SEVEN questions.** **8×7=56**

4. What is stack and queue? Discuss operation of stack with example. 4+4
5. Explain the algorithm for the evaluation of a postfix expression. 8
6. Explain bubble sort with example. 8
7. Discuss dijkstras algorithm with example. 8
8. Explain different hash collision resolution technique in brief. 8
9. What is different graph traversal method? Explain. 8
10. Explain binary searching method with explanation. 8
11. Write short notes on any TWO: 4+4
    (a) Abstract data type
    (b) Priority queue
    (c) Hashing

# PURBANCHAL UNIVERSITY
## 2019

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

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

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

*Candidates are required to give their answers in their own words as far as practicable.*

*Figure in the margin indicate full marks.*

## Group A

**Answer TWO questions.** **2×12=24**

1. Explain the internal architecture of 8086 microprocessor with suitable diagram. 12
2. What are the types of interrupts? Explain about basic interrupt processing in 8085 microprocessor. 4+8
3. Write a program in 8-bit Microprocessor to store 60h, 2Ah, 7Ch and 10h in the memory location starting from 3000h. Add these data and store the result in 4000h. Explain all the steps. 12

## Group B

**Answer SEVEN questions.** **7×8=56**

4. Write an assembly language program to multiply 05h and 06h. Explain all the steps.
5. Draw the timing diagram for MOV A, B and explain it.
6. How can you interface 8255A with microprocessor?
7. Explain the importance of addressing modes in the microprocessor. Discuss different types of addressing modes of 8086 microprocessor.
8. What are the functions of I/O interface? Explain it with example.
9. If 8085 adds two hex numbers 02H and 09H, what will be the content of accumulator and status flags?
10. Why serial communication is required? Explain with reference to 8-bit system.
11. Write short notes on any TWO.
    (a) DMA (b) Higher series of Intel processors
    (c) Program Counter

# PURBANCHAL UNIVERSITY

## 2019

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

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

**BIT275CO: User Interface Design** *(New Course)*

*Candidates are required to give their answers in their own words as far as practicable.*

*Figure in the margin indicate full marks.*

### Group A

**Answer TWO questions.** **2×12=24**

1. Describe essence of User Interface design. What are user's goals? Explain. 7+5

2. Discuss inter-operability. Discuss notion of MDI states. 5+7

3(a) How do you add visual richness to gizmos? 6

(b) How does canonical vocabulary help in user interface design? 6

### Group B

**Answer SEVEN questions.** **7×8=56**

4. What is selection? Why do we need it? How group selection is done? 2+2+4

5. What is a toolbar? What advantages does it provide over a menu? 2+6

6. What are Idioms and branding? Explain its importance. 4+4

7. What is dialog box? How does it help user? Explain its types. 1+2+5

8. What are child forms? Why they are necessary? Explain. 2+6

9. Why drag and drop is so popular? Explain its process. 3+5

10. How hierarchical menu paradigm is better than command line? 8

11. Write short notes on any TWO: 4+4
    (a) Resizing and reshaping
    (b) Entry gizmos
    (c) Suspension of interaction

# PURBANCHAL UNIVERSITY
## 2019

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

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

**BIT280CO: Numerical Methods** *(New Course)*

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

## Group A

**Answer TWO questions.** **2×12=24**

1(a) Define absolute and relative error with example. 2+2

(b) Solve the following system of linear equations by Gauss Siedal Iteration Method correct up to 3 decimal places. 8

$$5x - 2y + z = 4$$
$$7x - y - 5z = 8$$
$$3x + 7y + 4z = 10$$

2(a) Find the positive root of the equation: $x.e^x=1$, using Bisection method correct to three decimal places. 7

(b) Find square root of 5 using Newton-Raphson method. 5

3. Write an algorithm, flowchart and a program to solve a given non-linear equation using Newton Raphson Method in any High Level Language. 12

## Group B

**Answer SEVEN questions.** **7×8=56**

4. Compute the value of $I = \int_0^2 \frac{dx}{1 + x^2}$ by using Simpson's 1/3 rule with 6 stripes. 8

5. Solve $\frac{dy}{dx} - x^2 - y^2 = 0$; using Euler's method for y(1.8). The intial condition is y(1)=1 and h=0.2. 8

6. Fit the straight line y=a+bx 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 $\frac{dy}{dx}$ at x=(5.7) 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. Determine the largest Eigen value and corresponding Eigen vectors for the matrix using power method. 8

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

9. Use Newton's forward difference 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 |

10. Solve the differential equation for y(2) by fourth order R.K. method. Given, 8

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

11. Discuss the scope of numerical methods in the field of information technology. 8.