

PURBANCHAL UNIVERSITY

2017

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.

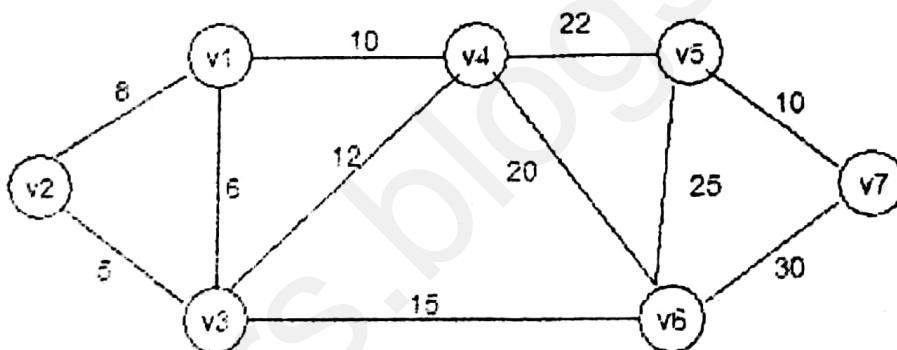
Figure in the margin indicate full marks.

Group A

Answer TWO questions.

$2 \times 12 = 24$

- What are the advantages of doubly linked list over singly linked list? Write an algorithm to insert a node in the middle position of doubly linked list.
- Define spanning tree. Find the minimum spanning tree from the following graph using kruskals algorithm.



- What do you mean by Hashing and Hashing function? Explain different collision resolution technique of hash value with example.

Group B

Answer SEVEN questions.

$7 \times 8 = 56$

- What is data structure? What are the advantages of data structure? Write an algorithm to perform Primitives operation of stack.
- Define ADT. Write an algorithm to evaluate post fix expression with example.
- What are the advantages of circular queue over linear queue? Show that queue is an ADT.

(2)

7. Compare recursion with iteration. Create a recursion tree of TOH with example.
8. Explain different graph traversal method with example.
9. Define tree with its application. Explain various tree traversal methods with example.
10. Write an algorithm to sort the data using bubble sort with example.
11. Define graph and explain the various graph representation technique with example.
12. Write short notes on any TWO:
 - (a) Heap sort
 - (b) Priority Queue
 - (c) Efficiency of sorting



PURBANCHAL UNIVERSITY

2016

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

$2 \times 12 = 24$

Answer TWO questions.

1. What is stack? Write an algorithm to evaluate a postfix expression with example.
2. What is tree? Explain Huffman algorithm with a suitable example.
3. Explain Disjkastra's algorithm with example.

Group B

$7 \times 8 = 56$

Answer SEVEN questions.

4. Discuss different types of graph. Explain Graph Traversal method with example.
5. Explain Radix Sort with example.
6. What is linked list? Differentiate between single linked list and double linked list.
7. What is recursion? Write algorithm to move n disks in tower of Hanoi problem.
8. What is hashing? Discuss different collision resolution techniques in brief.
9. Trace insertion sort to sort following data in ascending order:
50 20 -10 40 30 -20 90 25
10. What is searching? Compare sequential search with binary search.
11. Explain Kruskal's algorithm to find minimum spanning tree.
12. Write short notes on any TWO:
 (a) Big O notation (b) ADT (c) Priority Queue

PURBANCHAL UNIVERSITY

2015

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

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.

$2 \times 12 = 24$

- 1(a) What is a doubly linked list? How does it differ from a singly linked list? 2+2
- (b) Write an algorithm to delete the first node of a singly linked list. Write an algorithm for deletion of the first node of the singly linked list. 3+5
- 2(a) What is merge sort? Explain it with the help of an example. 2+4
- (b) Write an algorithm of merge sort. 6
- 3(a) What is a spanning tree? Explain Kruskal's algorithm with example. 6
- (b) Explain breadth first search of graph traversal with the help of a suitable example. 6

Group B

Answer SEVEN questions.

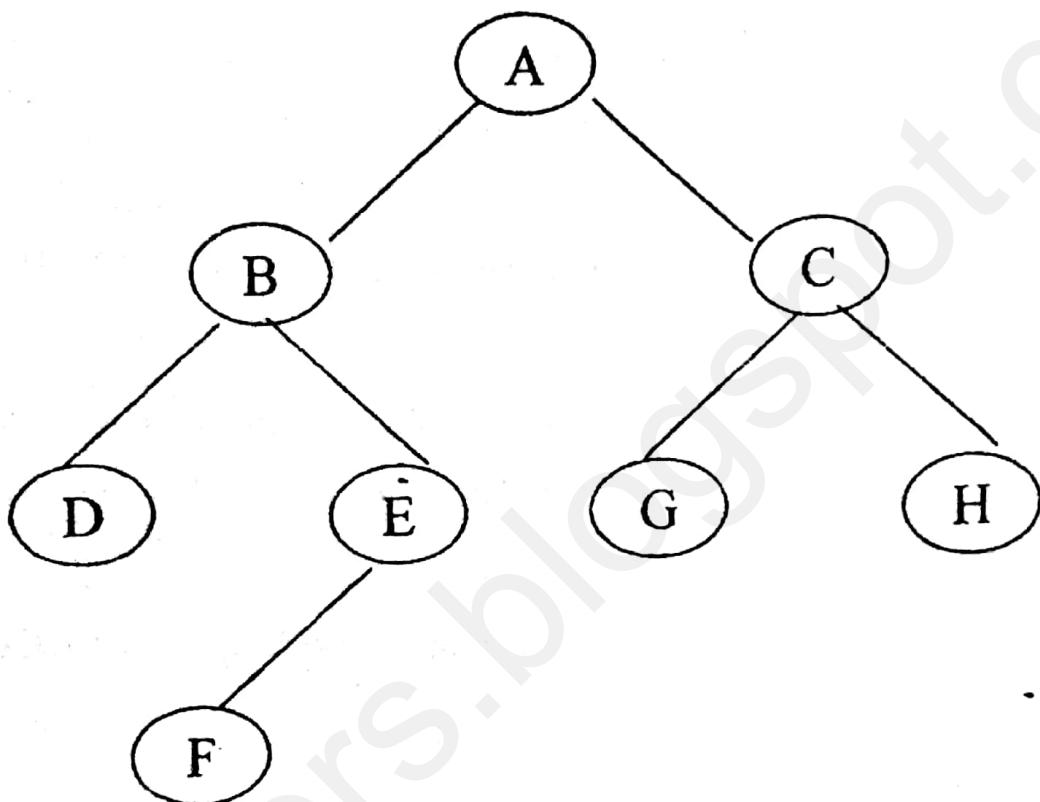
$7 \times 8 = 56$

4. What is a stack? Write algorithm for performing PUSH and POP operations in the stack. 2+2+4
5. What is a queue? Describe briefly any two type of queue. 3+5
6. Translate the following infix expression into its equivalent postfix expression: 8
- (A - B) * ((C+D)/E)

(2)

7. What is recursion? How does it differ from iteration? Explain recursion giving an example of calculation of factorial. 2+2+4

8. What is binary tree? Write an algorithm of inorder traversal of a binary tree. Also show the postorder traversal of the binary tree given below: 2+2+4



9. What is searching? Explain sequential search with an example. 3+5

10. Define hashing. What is a hash function? Explain with the help of a suitable example. 2+2+4

11. Write short notes on any TWO; 4+4

- (a) Abstract datatype
- (b) Evaluation of postfix expression
- (c) Collision resolution techniques for designing a good hash function
- (d) AVL trees



PURBANCHAL UNIVERSITY
2011

Bachelor in Information Technology (B.I.T.)/Third Semester/Final
Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BIT215CS: Data Structure & Algorithm

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.

$2 \times 12 = 24$

1. Explain balanced binary tree (AVL tree). Discuss the insertion process in a AVL tree. With example. 4+8
2. What is graph? Explain different types of graph. Discuss graph traversal method with example. 2+3+7
- 3(a) Discuss the advantages of circular Queue over linear Queue with example. 3
- (b) Explain different tree traversal method with example. 9

Group B:

Answer SEVEN questions.

$7 \times 8 = 56$

4. Discuss stack operation (algorithm) with example.
5. Define Queue. Write an algorithm to insert an element in a linear Queue.
6. Write an algorithm to insert an element in the middle of a doubly linked list.
7. Differentiate between recursion and iteration. Write an algorithm for TOH (Tower of Hanoi).
8. Describe Radix sort with example.
9. What is hashing? What is collision in Hashing? What are the methods to resolve the collision? Explain any one method with example.

(2)

10. Write an algorithm of Binary search.
11. What is Big O Notation? What are the different types of Big O Notations?
12. Write short notes on any TWO:
 - (a) Priority Queue
 - (b) ADT (Abstract data type)
 - (c) Divide and Conquer Algorithm / Parallel algorithm



PURBANGLA UNIVERSITY

2012

Bachelor in Information Technology (B.I.T.)/Third Semester/Final
Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BIT215CS: Data Structure & Algorithm

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.

1. Discuss Dijkstra's shortest path problem with example. 12
2. What is minimum weighted path length? Explain Huffman minimum weight path length Algorithm with example. 3+9
3. What is different types of Graphs? Explain graph traversal method with example. 4+8

Group B:

Answer SEVEN questions.

4. Explain different operating or stack.
5. Differentiate between linear queue and circular queue. Why circular queue is more useful than linear one?
6. What is doubly linked list? Write an algorithm to insert a node in the middle of the doubly linked list. 2+6
7. Differentiate between recursion and iteration. Discuss Fibonacci sequence with example. 4+4
8. Define Binary tree and discuss different Binary tree traversal method with example. 2+6
9. What is sorting? Explain bubble sort with example.
10. Discuss hashing with example and explain one collision resolution technique. 4+4
11. Evaluate the following arithmetic expression written in postfix notation.

(2)

12. Write short notes on any TWO:

- (a) Quick sort
- (b) Sequential search
- (c) Abstract data type



PURBANCHAL UNIVERSITY

2012

Bachelor in Information Technology (B.I.T.)/Third Semester/Final
Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BIT214CS: Microprocessor & Assembly Language

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

Figure in the margin indicate full marks.

Group A

$2 \times 12 = 24$

Answer TWO questions.

- 1(a) Explain the internal architecture of Intel 8085 microprocessor specifying all the necessary blocks. 7
- (b) What are the operating modes of 8086 microprocessor? Explain. 5
2. Draw the block diagram of 8279 keyboard and display controller and explain briefly the function of each block. 12
- 3(a) Explain the difference between primary memory and secondary memory in brief. 5
- (b) What do you mean by memory interfacing? Show how you can interface a $(4k \times 8)$ memory to the 8088 microprocessor. 2+5

Group B

$8 \times 7 = 56$

Answer EIGHT questions.

4. Write the 8086 assembly language statement which will perform the following operations: 7
- Load number 0301H into the BP register.
 - Copy the BP register contents to the SP register.
 - Copy the contents of the AX register to the DX register.
5. Draw the timing diagram of ADD M instruction. 7
6. Write the assembly language program to find the largest number in the data array. 7
7. Differentiate between synchronous and asynchronous mode of serial data transmission. 7

Contd. ...

(2)

8. What do you mean by interrupt? Explain various interrupt of 8085 microprocessor. 7
9. What is DMA? Explain the working principle of DMA with necessary timing diagram. 2+5
10. Write an assembly language programming to divide two numbers. The dividend is in 2050H and divisor is in 2051H. Store the quotient in 2055H and remainder in 2056H.
11. What do you mean by addressing modes? Explain the addressing modes of 8085 microprocessor. 3+4
12. Write short notes on any TWO:
(a) Pending interrupt
(b) Generation of microprocessor family
(c) PSW

~~~

# PURBANCHAL UNIVERSITY

2013 (New)

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

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

**BIT272CO: Microprocessor & Assembly Language**

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

Figure in the margin indicate full marks. -

## Group A

$2 \times 12 = 24$

**Answer TWO questions.**

1. Draw and explain briefly the function diagram of 8255A PPI. Write control word to initialize 8255A PPI to configure port A as mode one input port, port B as simple output port, port C upper as input and port C lower as an output port. 8+4

2. Draw an internal block diagram of Intel 8086 Microprocessor and explain. 6+6

- 3(a) With a neat functional diagram explain the operation of an USART. 6

- 3(b) Draw the block diagram and explain the operation of an 8279 keyboard/display interface. 6

## Group B

$7 \times 8 = 56$

**Answer SEVEN questions.**

4. Write an assembly language program in 8085 to multiply two 8-bit numbers stored in memory locations C200H and C01H by repetitive addition and store the result in memory locations C300H and C301H. 8

5. What is the significance of addressing modes? List down the addressing modes and explain. 8

6. Define interrupt. Explain and differentiate: polled and vector chained interrupts. 8

7. Differentiate between the asynchronous and synchronous and synchronous serial communication. 8

8. What is assembly and what are assembler directives? Explain. 8

(2)

9. Write an assembly language program in 8085 to calculate the sum of series of odd numbers from the list of numbers. The length of the list is in memory location 2200H and the series itself begins from memory location 2201H. Assume the sum to be 16-bit. Store the sum at memory locations 2300H and 2301H.
10. Draw the timing diagram for the STA 2000H instruction in 8085 microprocessor X
11. Design address decoding circuit which interface the RAM(8-KB) and ROM(8-KB) with 16-bit microprocessor. ✓
12. Write short notes on (any TWO):  
(a) Instruction cycle  
(b) RS-232C Standard  
(c) DMA controller

# PURBANCHAL UNIVERSITY

2016

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

$2 \times 12 = 24$

**Answer TWO questions.**

1. Define the term microprocessor. Draw and explain the each block of internal architecture of 8085 microprocessor. 2+5+5
- 2(a) Write short notes about the higher series of intel processor. 4
- (b) Draw the block diagram of 8251 serial interface circuit and explain it. 8
- 3(a) What do you mean by addressing modes? Explain the different types of addressing modes used in 8086 microprocessor with suitable example. 8
- (b) Mention the application of microprocessor. 4

## Group B

$7 \times 8 = 56$

**Answer SEVEN questions.**

4. Draw and explain the timing diagram of MOV A, B.
5. Describe the Von Neumann architecture with suitable diagram.
6. Write a program to add 10 numbers stored in memory. Describe about the flag used in 8085 microprocessor.
7. Explain about chained and polled interrupts.
8. Why we need DMA technology? With the suitable diagram explain the DMA operation.
9. Write a program 8086 to display string.

**(2)**

10. Differentiate between parallel and serial communication.  
Interface 2K\*8 RAM and 4K\*8 ROM with microcomputer system.
11. Describe the following instruction with examples: RAL, RAR,  
RLC, RRC, XCHG.
12. What do you mean by system bus? Describe the asynchronous  
and synchronous bus with suitable diagram.



**PURBANCHAL UNIVERSITY  
2017**

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**

$2 \times 12 = 24$

**Answer TWO questions.**

1. Draw a block diagram of 8086 microprocessor and explain each block diagram briefly. 6+6
2. Draw the block diagram of 8251 programmable communication interface showing clearly the read/write control logic, transmitter section, receiver section, data bus buffer and modem control. Explain briefly the function of each section. 12
3. Explain the operation of DMA. Draw the block diagram of 8237 DMA controllers and explain its mode of operation. 12

**Group B**

$7 \times 8 = 56$

**Answer SEVEN questions.**

4. Explain different types of memory devices.
5. Draw the timing diagram of IN 3CH instruction.
6. What is addressing modes? Explain the addressing modes of 8085 microprocessor with example.
7. Write the assembly language program to find the largest number in the array stored in locations from C050H to C05AH. Store the result in the memory location C0F0H.
8. Write a program to display string "Welcome to Purbanchal University" for 8086.
9. Explain different methods of parallel communication.
10. What do you understand by Assembler Directives? Explain any four.

(2)

11. Explain basic interrupt processing in 8085 microprocessor.
12. Write short notes on any TWO.
  - (i) Higher series of intel microprocessor
  - (ii) RS-232 standard
  - (iii) Fetch execution overlap

\*\*\*

**PURBANCHAL UNIVERSITY**  
**2015**

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

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.**

**$2 \times 12 = 24$**

~~1(a)~~ Explain basic block diagram of 8085 microprocessor in brief. 8

~~1(b)~~ Specify the results of register A, B, C and also the content of flag register after execution of instruction of the following program. Assume all flags are cleared initially: 4

MVI A, OOH  
MVI B, F9H  
MVI C, 3F H  
ADD C  
HLT

2. With a neat block diagram explain 8255A PPI. Write a control word for port A and upper half of port C as input port and port B and lower half of port C as output port. 12

~~3(a)~~ What do you mean by interrupt? Explain the various type of interrupt of 8085. 6

~~3(b)~~ What is interrupt priority? How interrupt priority can be set to handle multiple interrupts? Explain. 6

**Group B**

**Answer SEVEN questions.**

**$7 \times 8 = 56$**

~~4~~ Differentiate between microcomputer and microprocessor in brief. 8

5. Draw the timing diagram of STA 2000H instruction. 8

**(2)**

6. Write the assembly language program to find the sum of numbers stored from FCOOH to FCO9H. 8
7. Explain the operating modes of 8086 microprocessor. 8
8. What is DMA? Explain the basic operation of DMA. 2+6
9. Why memory interface is required? Explain different types of memory devices. 3+5
10. What do you mean by addressing modes? Explain the addressing modes of 8086 microprocessor. 3+5
11. Explain about synchronous and asynchronous mode of data transmission. 8
12. Write short notes on any TWO: 4+4
- (a) Pentium processor
  - (b) RIM and SIM instruction
  - (c) Assembler directives

**PURBANCHAL UNIVERSITY  
2015**

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.

**Answer EIGHT questions.**

$8 \times 10 = 80$

1. Explain about stored program concept. Elaborate addressing modes of 8085 microprocessor with examples. 5+5
2. What do you mean by fetch execution overlap? Draw the timing diagram of ANI 8 bit. ✓ 3+7
3. Define assembler directives with at least 4 examples. Write a program in 8085 to arrange ten bytes of data in descending order. Assume necessary data & memory locations. 2+2+6
4. Explain about non-modem connection. Explain about RS232 interface standard. ✓ 4+6
5. Explain in detail about interrupts used in 8085 and 8086 microprocessors. ✓ 10
6. Write a program in 8086 to display your name at the center of screen. 10
7. Explain about subroutines & explain about addressing modes of 8086 microprocessor. ✓ 3+7
8. Compare 8085 and 8086 microprocessor. Write a program in 8085 to separate an 8 bit word into lower & upper nibble and hence store the results at lower & upper at FCCOH & FCOIH memory location respectively. 10

on:

$2 \times 5 = 10$

operation

(b) Application of microprocessor ✓

**PURBANCHAL UNIVERSITY**  
**2015**

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.**

**$2 \times 12 = 24$**

1(a) Find by Newton's method, the real root of the equation  $3x = \cos x + 1$ , correct to four decimal places.

0.2420

(b) Apply Gauss elimination method to solve the equations  $x + 4y - z = -5$ ,  $x + y - 6z = -12$  and  $3x - y - z = 4$ .

2. Evaluate  $\int_0^1 \frac{dx}{1+x}$  correct to three decimal places using Romborg's method. Hence find the value of  $\log 2$ .

3. Using Runge-Kutta method of order 4, find  $y$  for  $x = 0.1, 0.2, 0.3$ ,

given that  $\frac{dy}{dx} = xy + y^2$ ,  $y(0) = 1$ .

Q. Q + 35  
ax bnt r

**Group B**

**Answer EIGHT questions.**

**$8 \times 7 = 56$**

4. Find a root of the equation  $x^3 - 4x - 9 = 0$ , using the bisection method correct to three decimal places.

5. By the method of least square, fit a parabola  $y = ax^2 + bx + c$  to the following data:

|   |     |     |      |      |      |      |
|---|-----|-----|------|------|------|------|
| x | 20  | 40  | 60   | 80   | 100  | 120  |
| y | 5.5 | 9.1 | 14.9 | 22.8 | 33.3 | 46.0 |

6. For the following values of  $x$  and  $y$ , find the first derivative at  $x = 4$ .

|   |   |   |   |    |    |
|---|---|---|---|----|----|
| x | 1 | 2 | 4 | 8  | 10 |
| y | 0 | 1 | 5 | 21 | 27 |

Contd. ...

7. Find the polynomial  $f(x)$  by Lagrange formula and hence find  $f(3)$  for:

|          |   |   |    |     |
|----------|---|---|----|-----|
| x:       | 0 | 1 | 2  | 5   |
| $f(x)$ : | 2 | 3 | 12 | 147 |

8. Using Euler's method, find approximate value of  $y$  when  $x = 0.6$  of  $\frac{dy}{dx} = 1 - 2xy$ , given that  $y = 0$  when  $x = 0$  (take  $h = 0.2$ ).  $\downarrow \rightarrow$

9. Solve the equation  $\nabla^2 u = -10(x^2 + y^2 + 10)$  over square with sides  $x = 0 = y$ ,  $x = 3 = y$  with  $u = 0$  on the boundary and mesh length  $= 1$ .

10. Using Newton's forward formula, find the value of  $f(1.6)$ , if:

|          |      |      |      |     |
|----------|------|------|------|-----|
| x:       | 1    | 1.4  | 1.8  | 2.2 |
| $f(x)$ : | 3.49 | 4.82 | 5.96 | 6.5 |

11. By the method of least squares, find the straight line that best fits the following data:

|    |    |    |    |    |    |
|----|----|----|----|----|----|
| x: | 1  | 2  | 3  | 4  | 5  |
| y: | 14 | 27 | 40 | 55 | 68 |

12. Discuss absolute error, relative and percentage error with example.

**PURBANCHAL UNIVERSITY  
2016**

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.**

**$2 \times 12 = 24$**

1(a) Find the root equation  $\cos x = x e^x$ , using the bisection method.

Correct to four decimal places.

(b) Using Newton's iterative method, find the real root of  $x \log_{10} x = 1.2$ .

Correct to five decimal places.

2. Solve by Gauss Sidel's iteration method, the equations  $10x+y-z=11.19$ ,  $x+10y+z=28.8$ ,  $x+y+10z=35.61$ , correct to two decimal places.

3. Using Runge-Kutta fourth order method to find an approximate value of  $y$  when  $x=0.2$  given that  $dy/dx=x+y$  and  $y=1$  when  $x=0$ . Take  $h=0.1$ .

**Group B**

**Answer SEVEN questions.**

**$7 \times 8 = 56$**

By the method of least squares, find the straight line that best fits the following data:

|    |    |    |    |    |    |
|----|----|----|----|----|----|
| x: | 1  | 2  | 3  | 4  | 5  |
| y: | 14 | 27 | 40 | 55 | 68 |

Find the first derivatives of  $f(x)$  at  $x=1.5$  if:

|       |       |       |        |        |        |        |
|-------|-------|-------|--------|--------|--------|--------|
| x:    | 1.5   | 2.0   | 2.5    | 3.0    | 3.5    | 4.0    |
| f(x): | 3.375 | 7.000 | 13.625 | 24.000 | 38.875 | 59.000 |

Evaluate  $\int_1^6 \frac{dx}{1+x}$  using Simpson's 3/8 rule for integration.

(2)

7. Using Newton's backward formula, find the value of  $f(2.4)$ , if

|          |      |      |      |      |      |
|----------|------|------|------|------|------|
| x:       | 1    | 1.4  | 1.8  | 2.2  | 2.6  |
| $f(x)$ : | 3.45 | 4.80 | 5.96 | 6.52 | 7.84 |

8. Find the largest eigen value and the corresponding eigen vector

of the matrix  $\begin{pmatrix} 1 & 2 & 0 \\ 2 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$ .

9. Discuss the scope of numerical method in the field of information technology.

10. Derive the formula for Trapezoidal rule for integration.

11. Use Lagrange interpolation polynomial method to estimate  $f(7)$  from the following data points:

|          |   |    |    |    |    |
|----------|---|----|----|----|----|
| x:       | 2 | 5  | 10 | 12 | 15 |
| $f(x)$ : | 9 | 14 | 16 | 20 | 30 |

\*\*\*

**PURBANCHAL UNIVERSITY**  
**2018**

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**

**$2 \times 12 = 24$**

**Answer TWO questions.**

1. find the root of the equation  $f(x) = x^3 - x - 1 = 0$  using Bisection Method and Newton Raphson Method correcting up to 3 decimal places and compare them.
2. Solve the given differential equation for  $y(2)$ ,  $\frac{dy}{dx} = \frac{y-x}{y+x}$ ,  $y(0)=1$  using fourth order R.K. method taking  $h=1$ .
3. Solve the following set of equations using Gauss Seidal Iteration Method.  
$$10x + 2y - 3z = 5$$
$$x + 10y - z = 8$$
$$3x - y + 10z = 12$$

**Group B**

**$7 \times 8 = 56$**

**Answer SEVEN questions.**

4. Find an equation of the form  $y = ax^b$  and find  $y(4.5)$  from the following data using least square method.

|    |   |   |   |    |    |    |
|----|---|---|---|----|----|----|
| x: | 2 | 4 | 6 | 8  | 10 | 12 |
| y  | 1 | 4 | 9 | 16 | 25 | 36 |

5. Find  $f(1.7)$  and  $f(5.8)$  using Newton Forward Formula:

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
| x: | 1    | 2    | 3    | 4    | 5    | 6    |
| y  | 0.23 | 1.45 | 2.45 | 3.67 | 4.33 | 5.12 |

**(2)**

6. Find  $y(4)$  of the differential equations  $dy/dx = 2x^2 + y$  with  $y(2) = 1$  using Euler's method, taking  $h = 0.5$ .
7. Solve the following set of equations using Gauss elimination method.
- $$x + 2y - z = 2$$
- $$4x - y + z = 5$$
- $$x - 2y + 4z = 9$$
8. Find  $f'(2)$  and  $f''(5)$  from the following table.
- | x: | 1      | 2      | 3      | 4      | 5      | 6      |
|----|--------|--------|--------|--------|--------|--------|
| y: | 1.1051 | 1.2214 | 1.3498 | 1.4918 | 1.6487 | 1.8221 |
9. Evaluate  $\int_0^1 \frac{dx}{1+x}$  using Simpson's  $\frac{3}{8}$  rule and hence estimate the value of  $\ln(2)$ .
10. What is the role and significance of Numerical Methods for an IT Professional?
11. Write a program to fit the straight line for the given set of data points.



# **PURBANCHAL UNIVERSITY**

**2016**

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

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

**BIT270CO: System Analysis & 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.**

**$2 \times 12 = 24$**

1. What is SDLC? Explain its steps. Under what circumstances does an analyst prefer to use waterfall model? Explain.
2. How does DFD help in Process Modeling? Draw a context diagram and higher level DFD's for a Hospital Management System. Make suitable assumptions if necessary.
3. What is an ER diagram? Draw an ER diagram for a Banking Information System.

## **Group B**

**Answer SEVEN questions.**

**$7 \times 8 = 56$**

4. Explain decision tree and structure English with suitable example.
5. What is feasibility analysis? Explain various types of feasibility analysis.
6. What is functional independence of a module? Explain various types of cohesion.
7. What is normalization? Explain 1NF and 2NF with suitable example.
8. What is system Implementation? Differentiate between system user documentation.
9. Explain the process of Physical Database Design.
10. Explain Object Oriented Analysis and Design. Draw a state diagram for an online purchase system.
11. What is initial investigation? Explain few information-gathering techniques.
12. Write short notes on any TWO:
  - (a) Decision table
  - (b) Sequential file organization
  - (c) Decision support system

**PURBANCHAL UNIVERSITY  
2015**

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

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

**BIT270CO: System Analysis & 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.**

**$2 \times 12 = 24$**

1. What do you mean by process modeling? Explain how data flow diagram help in process modeling? Draw context diagram and higher level dfd's for a library management system.
2. What is system analysis? Explain various requirement gathering methods with suitable example.
3. What do you mean by modular system design? What is functional strength of a module? Describe various types of cohesion and coupling.

**Group B**

**Answer SEVEN questions.**

**$7 \times 8 = 56$**

4. Explain system development life cycle. How spiral model is different from other SDLC models?
5. What is conceptual modeling? Explain ER diagram with a suitable example.
6. Define logic modeling. Explain decision table as a tool of logic modeling.
7. What do you mean by cost/benefit analysis? Explain NPV method.
8. What is system implementation? Explain all the activities in brief, that are carried out during system implementation.
9. What is Use-case modeling? Draw a use-case diagram for a university registration system.

**(2)**

10. What is system testing? Differentiate between static and dynamic testing.
11. What is file organization? Explain logical and physical database design in brief.
12. Write short notes on any TWO:
  - (a) CASE tools
  - (b) MIS Vs. DSS
  - (c) Data dictionary



**PURBANCHAL UNIVERSITY  
2017**

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

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

**BIT270CO: System Analysis & 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.**

$2 \times 12 = 24$

1. What is process modeling? Explain the role of Data Flow Diagram in process modeling. Draw a O-level dfd and context diagram for University Registration System.
2. Explain all the important activities that are carried out during system implementation. What is system maintenance?
3. Why System Design is considered as most challenging task? Explain all the steps of database design. What do you mean by file organization?

**Group B**

$7 \times 8 = 56$

**Answer SEVEN questions.**

4. What do you mean by object oriented analysis and design? Give an example of USE-CASE diagram.
5. What is information system? Explain its types.
6. What are the CASE tools. List and explain case-tools that are used in various phases of system development.
7. What is conceptual modeling? How does ER diagram help in conceptual modeling? Explain.
8. Explain decision table with a suitable example.
9. Define system analysis? What is the importance of feasibility study in system analysis?
10. What is SDLC? Explain spiral model in brief.
11. What is Cost/Benefits analysis? Explain NPV method.
12. Write short notes on any TWO:  
(a) Prototyping                              (b) State Diagram                            (c) Inspection

**PURBANCHAL UNIVERSITY  
2013**

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.**

**$2 \times 12 = 24$**

1. What are user's goals? Explain the models of interface design and relate them from user's viewpoint. 2+10
2. Distinguish between modal and modeless dialog boxes. Explain the types of dialog boxes. 4+8
3. What is gizmo? Discuss bounded and unbounded entry gizmos with examples. Why is validation gizmo required? 2+8+2

**Group B**

**Answer SEVEN questions.**

**$7 \times 8 = 56$**

4. Explain how does canonical vocabulary help to create effective visual interface.
5. Why is metaphoric paradigm considered as a risky process in software design? How does idiomatic paradigm solves the problems with metaphors?
6. Define task coherence. Why excise tasks need to be eliminated?
7. What is hinting? Explain the types of hinting with examples.
8. What is system menu? Explain the menu-item variations.
9. What are selection gizmos? Explain any two selection gizmos with examples.
10. What do you mean by master and target objects in drag-and-drop operation? Explain drag-and-drop mechanism.
11. What is a unified file system and how is it beneficial when rendered according to user's mental model?

# PURBANCHAL UNIVERSITY

2016

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.**

1. Define selection. Explain additive and group selection.  
Distinguish between insertion and replacement? 2+6+4
2. What do you mean by cast? Discuss drop-down menus and pop-up menus. Explain the advantages of toolbars over menus. 2+6+4
3. Explain the features of essential and selection gizmos with examples of each?

$2 \times 12 = 24$

## Group B

**Answer SEVEN questions.**

$7 \times 8 = 56$

4. What is software design? What are the disciplines related to software design?
5. What do you mean by windows pollution? How is document managed in unified file model?
6. Define overhead. Why is it necessary to eliminate excise tasks and how is it done?
7. What is drag and drop operation? Explain its mechanism.
8. What is meant by suspension of interaction? Differentiate between model and modeless dialog boxes.
9. Explain bounded and unbounded entry gizmos with example.
10. What do you mean by manifest mode? How does it reduce the gap between other two models?
11. Write short notes on:  
(a) Interoperability  
(b) Binding  
(c) Windowing

**(2)**

10. Define retrieval system. What are the fundamental ways to find a document?
11. What is validation? Explain different validation techniques.
12. Write short notes on any TWO:
- (a) Idioms and branding
  - (b) Canonical vocabulary
  - (c) Expanding and cascading dialog boxes



**PURBANCHAL UNIVERSITY  
2015**

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.**

**$2 \times 12 = 24$**

1. What are the different models of Interface design? Explain each of them in detail with suitable example?
2. What is the purpose of menu? Why do we need menu? Explain different types of menus with suitable examples.
3. Explain the models of user interface design in detail. Why canonical vocabulary is important in GUI?

**Group B**

**Answer SEVEN questions.**

**$7 \times 8 = 56$**

4. Differentiate CUI, GUI and VUI.
5. What do you mean by selection? Discuss its types with examples.
6. Why is toolbar necessary in user interface? Explain its advantages over menus.
7. What do you mean by direct manipulation? Explain repositioning, reshaping and resizing.
8. What are dialog boxes? Differentiate model and modeless dialog box.
9. What do you mean by Window Pollution?
10. What are mouse events? Explain the mouse events that you know.

Write short notes on:

(a) Types of dialog boxes  
[bit-papers.blogspot.com](http://bit-papers.blogspot.com)

(b) Popup menu  
19171R

**PURBANCHAL UNIVERSITY**  
**2017**

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.**

**$2 \times 12 = 24$**

1. What is User interface design? Why do we need it in Software development? Explain models of Interface design.
2. Explain the types of interface paradigms. Explain features of user interface design.
3. What do you mean by canonical vocabulary? How it helps in interface design? Justify it.

**Group B**

**Answer SEVEN questions.**

**$7 \times 8 = 56$**

4. How do you define gizmos? Explain entry and display gizmos with examples.
5. What is overhead in software interaction? Why is it important and how to minimize the excise tasks?
6. Define menu in application software? Discuss menu design issues.
7. What are the toolbars? Explain them with their advantages.
8. What do you mean by flow in software interaction? How do we maintain work flow in software?
9. What is dialog box? Distinguish between Modal and Modeless dialog boxes.
10. What is visual feedback of manipulation? Explain with example.
11. Write short notes on:  
(a) Task coherence  
(c) Idioms and branding  
(b) Windows pollution



**PURBANCHAL UNIVERSITY**  
**2014 (NEW)**

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.**

**$2 \times 12 = 24$**

1. What is menu? Explain the types of menu. What are the variations of menu items? Explain with examples. 6+6
2. What are interface paradigms? Discuss about the different paradigms concerned in the design of user interfaces.
3. Define selection and compare it with insertion with suitable examples. Explain reposition, resize and reshape operations in manipulating gizmos. 6+6

**Group B**

**Answer SEVEN questions.**

**$7 \times 8 = 56$**

4. Is software design same as interface design? Explain the disciplines related to software design.
5. What is flow? What are the techniques to create flow during software interaction?
6. What do you mean by imperative gizmos? Explain with examples, how these gizmos have offered a variety of advantages.
7. Explain how GUIs that are based on canonical vocabulary follows user's mental model.
8. Define platform dependence. What are the issues for software development related to platform?
9. What are the different window states? Mention the reasons of switching an application to those states.
10. What is drag and drop operation? What are the problems with this operation? Mention the possible solutions for those problems.

(2)

11. Explain the types of dialog boxes from goal directed viewpoint.
12. Write short notes on any TWO:
  - (a) Display gizmos
  - (b) Task coherence
  - (c) Document management



**(2)**

12. Write short notes on any TWO:

- (a) Interoperability
- (b) Window States
- (c) Selection

