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**BCACAC 21**



**Credit Based Third Semester B.C.A. Degree  
Examination, October/November 2016  
(Common to all Batches)  
OPERATING SYSTEM**

Time : 3 Hours

Max. Marks : 80

**Note : Answer any ten questions from Part A and one full question from each Unit of Part B.**

**PART - A**

1. a) Distinguish between a program and process. (10×2=20)
- b) List out the four process states.
- c) Define PCB.
- d) Define deadlock.
- e) What are semaphores ?
- f) Define wait-for graph.
- g) Differentiate between logical address and physical address.
- h) Define virtual memory.
- i) Mention any four types of file extensions.
- j) What is the purpose of cat command in Linux ?
- k) Define a kernel.
- l) What is the purpose of break command in Linux ?

**PART - B**

**UNIT - I**

2. a) Explain batch process systems and real time systems.
- b) Explain FCFS scheduling with an example.
- c) Briefly explain co-operating process. (6+)



3. a) Explain the services provided by operating system.  
 b) Consider the following set of processes that arrive at time 0 with the length of the CPU-burst time given in milliseconds.

Process	Burst time
P <sub>1</sub>	6
P <sub>2</sub>	8
P <sub>3</sub>	7
P <sub>4</sub>	3

Draw Gantt chart and find average waiting time and turn around time using SJF scheduling.

- c) Compare and contrast thread and process. (5+5+5)

#### UNIT – II

4. a) Explain dining philosophers' problem.  
 b) Explain the concept of semaphores with pseudo code for wait and signal.  
 c) List and explain necessary and sufficient condition for deadlock to occur. (4+5+6)
5. a) What is critical section ? What are the requirements for a solution to critical section problem ?  
 b) Explain resource-allocation graph with an example.  
 c) Write a short note on safe state. (4+5+6+4)

#### UNIT – III

6. a) Explain the concept of swapping with a neat diagram.  
 b) Explain FIFO page replacement algorithm with an example.  
 c) Briefly explain direct and sequential access of files. (4+5+6)
7. a) Explain the concept of paging with an example.  
 b) Explain any five operations on files.



c) Consider the following page reference string  
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

How many page faults would occur for the following replacement algorithm, assuming three frames ?

- i) LRU algorithm
- ii) Optimal replacement algorithm.

(4+5+6)

UNIT – IV

- 8. a) Explain the features of Unix operating system.
- b) Explain the case statement in Linux with an example.
- c) Explain any five process oriented commands available in Linux. (5+5+5)
- 9. a) Explain the Linux file system with a neat diagram. (10+2=20)
- b) Explain the any two iterative statements in Linux with example.
- c) Explain any five file oriented commands in Linux. (5+5+5)





3. a) Explain different Data Warehouse Schema.  
 b) Explain the various stages of KDD.  
 c) Briefly explain any four application fields of Data Mining. (5+5+5)

### Unit – II

4. a) Explain Apriori algorithm with an example.  
 b) Explain briefly hierarchical and partitioning clustering.  
 c) Write a brief note on CLARA. (5+5+5)
5. a) Explain Partition algorithm with an example.  
 b) Explain the principle of Tree Construction.  
 c) Explain ID3 decision tree algorithm. (5+5+5)

### Unit – III

6. a) Explain the following terms :  
 i) Information System  
 ii) Indiscernibility Relation.  
 b) Explain the typical artificial neurons with activation function.  
 c) Describe the learning technique in Mutli Layer Perceptron. (5+5+5)
7. a) Explain Rough Set Theory.  
 b) Explain RBFN with a neat diagram.  
 c) Explain the Support Vector Machines. (5+5+5)

### Unit – IV

8. a) Explain the types of Web Usage mining.  
 b) Write a note on web structure mining.  
 c) Explain Sequence mining with suitable example. (5+5+5)
9. a) Explain different features of unstructured text.  
 b) Explain different types of temporal data mining.  
 c) Explain Episode discovery. (5+5+5)

Credit Based Third Semester B.C.A. Degree Examination, Oct./Nov. 2016  
(Common to all Batches)  
**BASIC MATHEMATICS**

Time : 3 Hours

Max. Marks : 80

**Note** : Answer **any ten** questions from Part – A and **one full** question from **each** Unit from Part – B.

## PART – A

1. a)  $x = \log_7 27$   $y = \log_5 7$   $z = \log_3 5$  prove that  $x.y.z = 3$ . (10×2=20)
- b) Find the number of permutations of the word "ENGINEERING".
- c) Find the distance between (9, -1) (-2, 10)
- d) If  $y = 2x + x^2$  what is  $\frac{dy}{dx}$  ?
- e) Define continuity of a function.
- f) Integrate  $7x^2 - 3x + 8$  w.r.to x.
- g) Represent i)  $\sim(A \cup B)$  ii)  $B - A$ .
- h) Write the power set of  $A = \{1, 2, 3\}$ .
- i) Define equivalence relation.
- j) Define a cycle. Give example.
- k) Define simple path.
- l) Define multi graph with an example.

## PART – B

## Unit – I

2. a) Prove that  $\frac{\log \sqrt{27} + \log \sqrt{8} - \log \sqrt{125}}{\log 6 - \log 5} = \frac{3}{2}$ . (5+4+)
- b) Show that (2, -2) (8, 4) (5, 7) and (-1, 1) are the vertices of a rectangle.
- c) Expand  $\left(\frac{x}{3} + \frac{2}{y}\right)^4$  using Binomial theorem.

3. a) Find the middle terms in the expansion of  $\left(3x - \frac{2x^2}{3}\right)^7$ . (5+5+5)
- b) Evaluate  $\log \frac{41}{35} + \log 70 - \log \frac{41}{2} + 2 \log 5$ .
- c) Find the coordinates of the point which divides internally and externally the line joining (2, -4) and (7, 1) in the ratio 2:3.

## Unit - II

4. a) If  $\sin \theta = \frac{15}{17}$  and  $\theta$  is an acute angle find the values of other trigonometric functions. (5+6+4)
- b) Find the value of i)  $\int_2^4 (3x-2)^2 dx$  ii)  $\left(\int_{-1}^1 \frac{1}{x^2} - \frac{1}{x^3}\right) dx$ .
- c) Evaluate  $\lim_{x \rightarrow 2} \frac{2x^2 - 5x + 2}{x^2 - 3x + 2}$ .
5. a) Prove that function  $x^2 + 4x - 2$  is continuous at  $x = 1$ . (5+5+5)
- b) Differentiate  $9x^4 - 7x^3 + 8x^2 - \frac{8}{x} + \frac{10}{x^3}$  with respect to  $x$ .
- c) If  $\sec \theta = \frac{13}{5}$  and  $\theta$  is in the 4<sup>th</sup> quadrant find the value of  $\frac{2 \sin \theta - 3 \cos \theta}{4 \sin \theta - 9 \cos \theta}$ .

## Unit - III

6. a)  $A = \{1\}$   $B = \{a, b\}$   $C = \{2, 3\}$  write  $A \times B$ ,  $B^2$ ,  $B^2 \times A$ ,  $A \times B \times C$ ,  $C^2 \times A$ . (5+5+)
- b)  $A = \{x/x \text{ is an integer and } 0 \leq x \leq 5\}$ ,  $B = \{3, 4, 5, 17\}$  and  $C = \{1, 2, 3\}$ .  
Find : i)  $A \cup B$  ii)  $A \cap B$  iii)  $A - B$  iv)  $A - C$  v)  $A \cap C$
- c)  $P = \{<1, 2>, <2, 4>, <3, 3>\}$   $Q = \{<1, 3>, <2, 4>, <4, 2>\}$   
Find  $D(P)$ ,  $D(Q)$ ,  $D(P \cup Q)$ ,  $R(P)$  and  $R(P \cap Q)$ .



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7. a)  $R = \{ \langle 1, 1 \rangle, \langle 1, 2 \rangle, \langle 1, 4 \rangle, \langle 2, 1 \rangle, \langle 2, 2 \rangle, \langle 2, 3 \rangle, \langle 3, 2 \rangle, \langle 3, 3 \rangle, \langle 4, 2 \rangle, \langle 4, 4 \rangle \}$ . (5+5+5)

Construct relation matrix of R and draw digraph of R.

- b) Let  $X = \{1, 2, 3\}$  f, g, h and s are the functions from X to X given by

$f = \{ \langle 1, 2 \rangle, \langle 2, 3 \rangle, \langle 3, 1 \rangle \}$   $h = \{ \langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle 3, 1 \rangle \}$

$g = \{ \langle 1, 2 \rangle, \langle 2, 1 \rangle, \langle 3, 3 \rangle \}$   $s = \{ \langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle 3, 3 \rangle \}$

Find  $f \circ g, g \circ f, s \circ s, f \circ h \circ g, s \circ g,$  and  $f \circ s$ .

- c) Define Surjective, Injective and Bijective functions with example.

**Unit - IV**

8. a) Explain with suitable example to each terms : Multi graph, Weighted graph and undirected graph. (5+5+5)

- b) Explain binary tree with suitable example.

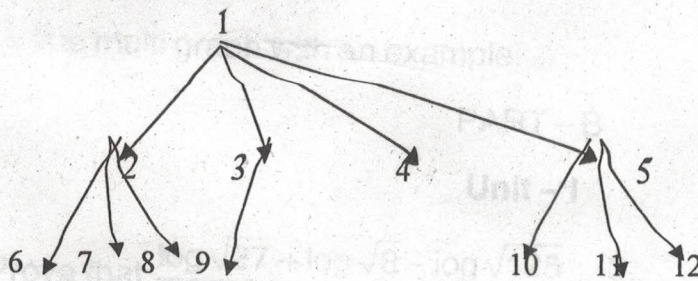
- c) Define the following term with an example :

- i) Total degree    ii) Elementary path    iii) Directed tree    iv) Length of path.

9. a) Explain the matrix representation of graph with suitable example. (4+6+5)

- b) With example explain the terms path, reachability and connectedness with example

- c) Convert the following tree into a binary tree.



8



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BCACAC 209

**Credit Based III Semester B.C.A. Degree Examination, Oct./Nov. 2016**  
**(Common to all Batches)**  
**MICROPROCESSORS**

Time : 3 Hours

Max. Marks : 80

**Note :** Answer **any ten** questions from Part – A and **any one full** question from **each** Unit in Part – B.

**PART – A**

1. a) List any two features of 4004 microprocessor. (10×2=20)
- b) Expand XMS and TPA.
- c) Represent 64 in unpacked and packed BCD format.
- d) Which registers move on to the stack with PUSH instruction ?
- e) What is the purpose of LEA instruction ? Give example.
- f) Differentiate SUB and CMP instructions.
- g) What is the use of SI and DI registers in string manipulation instructions ?
- h) Differentiate intersegment and intrasegment jumps.
- i) What is IP register ? What is its use ?
- j) What is the purpose of STI and CLI instructions ?
- k) What is the use of NOP instruction ?
- l) List any two applications of microcontrollers.

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P.T.O.



## PART - B

## Unit - I

2. a) What is a bus ? Explain how the different parts of computer system are connected through various buses.
- b) List the various multipurpose registers of 8086 and explain any five.
- c) Explain the following Assembler Directives.

i) Assume                      ii) DB

(5+6+)

3. a) Explain Microprocessor based computer system with a neat diagram.
- b) With the diagram of the Flag register explain any four status flags.
- c) Write a note on :

i) BCD data                      ii) Byte sized data

(6+5+)

## Unit - II

4. a) Explain Register, Immediate and Direct addressing modes with examples to each.
- b) Explain the operation of PUSH and POP instruction.
- c) Explain the following string data transfer instructions with examples to each

i) LODSB                      ii) MOVSB

(6+5+)

5. a) Briefly explain program memory addressing modes.
- b) Assume DS = 2000H, SS = 1000H BP = 0200H and DI = 0300H.

Determine the physical address accessed by following instruction.

i) MOV [BP + 20H], DX

ii) MOV BL, [DI-100H]

- c) What is the purpose of segment override prefix ? Give example.

(6+5+4)



**Unit – III**

6. a) Differentiate the following instructions :  
i) AND and TEST      ii) NOT and NEG  
b) Explain MUL and DIV instructions with examples.  
c) Explain Short jump and Near jumps with examples. (4+6+5)
7. a) Explain different Rotate instructions with examples.  
b) Explain LOOP, LOOPE and LOOPNE instructions with examples.  
c) Write an assembly level program to add two BCD numbers. (6+5+4)

**Unit – IV**

8. a) Explain NEAR and FAR calls with suitable examples.  
b) Explain procedures with suitable example.  
c) Write a note on :  
i) WAIT      ii) BOUND (6+5+4)
9. a) Explain the interrupts INTO and INT 3H.  
b) Explain the following instruction  
i) IRET      ii) HLT      iii) NOP  
c) What is microcontroller ? Write its block diagram. (5+5+5)

11