

Reg. No.

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**BCACACS 101**

**First Semester B.C.A. Degree Examination, December 2024/January 2025  
(SEP) (2024 – 25 Batch Onwards)  
FUNDAMENTALS OF COMPUTERS**

Time : 3 Hours

Max. Marks : 80

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

**PART – A**

1. Answer **any ten** questions.

**(10×2=20)**

- a) What do you mean by generations of Computers ?
- b) Differentiate RAM and ROM.
- c) What is Cache memory ?
- d) Define System Software. Give an example.
- e) What are Language Translators ?
- f) What is Machine Language ?
- g) Obtain the 1's and 2's Complements of the following binary numbers.
  - i) 1010101
  - ii) 000001
- h) What is meant by RADIX of the number system ?
  - i) What is Excess-3 code ? Give an example.
  - j) Write truth table and logic expression of NOR gate.
- k) What are minterm and maxterm ?
- l) Write the general structure of 2 variables K-Map.



P.T.O.



## PART – B

## Unit – I

2. a) List and explain characteristics of Computers.  
b) Draw the block diagram of a Computer System and explain the components of a Computer System.  
c) Briefly explain any two pointing device. (5+5+5)
3. a) List and explain in brief the characteristics of Third-Generation Computers.  
b) Explain the applications of Computers in different fields.  
c) List out any four registers available in CPU along with its function. (5+5+5)

## Unit – II

4. a) Define Operating System and explain basic functions of an Operating System.  
b) Write a note on :  
i) Word Processors  
ii) Image Editors.  
c) Write an algorithm to display maximum of three numbers. (5+5+5)
5. a) Briefly explain different phases of the Program Development Cycle.  
b) Explain functions of System Utilities.  
c) List and explain the advantages of high level languages. (5+5+5)

## Unit – III

6. a) State and prove De-Morgan's theorems for two variables.  
b) Write the procedure to perform r's complement subtraction with example.  
c) Using Venn diagram prove that  $A.(BC) = (AB).C$ . (5+5+5)



- 7. a) Convert  $(225.222)_{10} = ( )_2 = ( )_8 = ( )_{16}$ .
- b) State and prove any two theorems of Boolean algebra.
- c) Perform following subtraction using 9's and 10's complement methods :  
 $(1234)_{10} - (743)_{10}$  (5+5+5)

**Unit – IV**

- 8. a) How do you get complement of a function ? Find the complement of  
 $F1 = x'yz' + x'y'z$   
 $F2 = x(y'z' + yz)$
  - b) Implement the following Boolean function using gates and also write the truth table.
    - i)  $F = xyz'$
    - ii)  $F = xy' + x'z$
  - c) Using K-Map simplify the following expression.  
 $F(A, B, C, D) = \Sigma(0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$  (5+5+5)
- 9. a) Prove that NAND is universal gate.
  - b) Express the Boolean function  $F = XY' + X'Z$  as sum of minterm and product of maxterm.
  - c) Using K-map simplify the following expression :  
 $F(A, B, C) = \Sigma(1, 2, 5, 7) + \Sigma(0, 4, 6)$  (5+5+5)

