

3. Simplify using Karnaugh map and implement by using NOR gates only

$$Q(A, B, C, D) = \sum m(1, 5, 6, 8, 11, 12, 13).$$

4. Discuss the internal architecture of 8085 with a neat block diagram.
5. (a) Explain the addressing modes of 8085 with examples. (10)  
(b) What is meant by memory mapped I/O? Explain. (10)
6. Discuss the working of a DMA controller with a block diagram.
7. (a) Discuss the working of associative memory with diagram and match logic. (12)  
(b) Explain any one page replacement algorithm. (8)
8. Discuss :
- (a) CPU-IOP communication
  - (b) Ripple counters
  - (c) Gray code.

Reg. No. : .....

D 1023

Q.P. Code : [07 DSC 01/  
07 DSCA 02/07 DIT 02]

(For the candidates admitted from 2007 onwards)

B.Sc./B.C.A. DEGREE EXAMINATION, MAY 2013.

First Year

Part III — Computer Science/Computer Application/  
Information Technology

DIGITAL FUNDAMENTALS AND ARCHITECTURE

Time : Three hours

Maximum : 100 marks

Answer any FIVE questions.

1. (a) Draw the circuit of a full adder and give its truth table. (10)  
(b) What are universal gates? Why are they called so? Justify. (10)
2. (a) Convert the following :  
(i)  $100_{10}$  in to binary  
(ii)  $123.12_{11}$  in to octal  
(iii)  $11011.11_2$  in to decimal. (3 + 3 + 4)  
(b) Draw the circuit of a JK flip flop and explain its working. (10)

2. (a) Find  $f'(50)$  and  $f''(50)$  from the following data

X: 50 51 52 53 54 55 56

Y: 3.6840 3.70843 3.7325 3.7563 3.7798 3.8030 3.8259

- (b) Evaluate  $I = \int_1^{6.2} \log_e x$  using Simpson's three eighth rule. (10+10)

3. (a) Using Lagrange's interpolation formula find  $Y(10)$  from the following.

X: 5 6 9 11

Y: 12 13 14 16

- (b) Compute  $Y(0.1)$  and  $Y(0.2)$  using Range-Kutta fourth order method, given that

$$\frac{dy}{dx} = -y - xy^2, y(0) = 1, h = 0.1. \quad (8+12)$$

4. (a) Calculate the arithmetic mean and standard deviation from the following data.

X: 0-10 10-20 20-30 30-40 40-50 50-60 60-70 70-80

Y: 12 18 35 42 50 45 20 8

Reg. No. : .....

D 1024

Q.P. Code : [07 DSCA 03]

(For the candidates admitted from 2007 onwards)

B.C.A. DEGREE EXAMINATION, MAY 2013.

First Year

Part III — Computer Applications

Allied : COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS

Time : Three hours

Maximum : 100 marks

Answer any FIVE questions.

All questions carry equal marks.

(5 × 20 = 100)

1. (a) Find the positive note of  $x^3 - 2x - 5 = 0$  using False position method.

- (b) Solve the following using Gauss-Seidel iterative procedure.

$$10x_1 + x_2 + x_3 = 12$$

$$2x_1 + 10x_2 + x_3 = 13$$

$$2x_1 + 2x_2 + 10x_3 = 14$$

(8+12)

7. (a) Find an iterative formula to find  $\sqrt{N}$  (where N is a positive number) and hence find  $\sqrt{5}$  with the help of Newton-Rashson method.

(b) Solve the following using Gauss-Elimination method. (10+10)

$$2x + 3y - z = 5$$

$$4x + 4y - 3z = 3$$

$$2x - 3y + 2z = 2$$

8. (a) Find a polynomial of degree two from the following.

X: 0 1 2 3 4 5 6 7

Y: 1 2 4 7 11 16 22 29

(b) Determine the value of  $I = \int_0^6 \frac{dx}{1+x}$  using

Trapezoidal rule and Simpson's rule with six intervals. (8+12)

(b) Calculate median and mode from the following.

X: 0-10 10-20 20-30 30-40 40-50 50-60 60-70 70-80

Y: 5 15 30 55 85 60 45 25

(10+10)

5. (a) Calculate the correlation coefficient and obtain the lines of Regression.

X: 1 2 3 4 5 6 7 8 9

Y: 9 8 10 12 11 13 14 16 15

(b) State the properties of Regression coefficients. (14+6)

6. (a) Given the following data, calculate the value of Y when x = 12.

X Y

Average : 7.6 14.8

Standard deviation : 3.6 2.5

Correlation coefficient: r = 0.99

(b) Calculate the rank correlation coefficient after assigning ranks. (6+14)

X: 48 33 40 9 16 16 65 24 16 57

Y: 13 13 24 6 15 4 20 9 6 19

4. (a) Explain the USACE clause in COBOL. (10)  
(b) Explain the ROUNDED and ON SIZE ERROR options in COBOL with examples. (10)
5. Explain the various types of conditions in COBOL with examples. (20)
6. Write a COBOL program for Mark sheet preparation by designing your own assumptions. (20)
7. Explain the statements for sequential files in COBOL. (20)
8. Explain the various forms of PERFORM verb with table handling in COBOL.
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Reg. No. : .....

D 1022

Q.P. Code : [07 DSCA 01]

(For the candidates admitted from 2007-08 onwards)

B.C.A. DEGREE EXAMINATION, MAY 2013.

First Year

Part III – Computer Application

COBOL PROGRAMMING

Time : Three hours

Maximum : 100 marks

Answer any FIVE questions.

All questions carry equal marks.

(5 × 20 = 100)

1. (a) Explain the structure of a COBOL program. (8)  
(b) Explain with examples, the various types of literals in COBOL. (12)
2. Explain the Data Description entries in COBOL. (20)
3. Explain the Input/Output verbs in COBOL. (20)