(i) Printed Pages : 3   Roll No. ....

(ii) Questions   : 9   Sub. Code : | 1 | 3 | 4 | 2 | 1 |
                             Exam. Code : | 5 | 0 | 4 | 2 |

Bachelor of Computer Application (FYUP) 2nd Semester
(2055)

COMPUTER ORGANIZATION

Paper : NBCA201

Time Allowed : Three Hours]   [Maximum Marks : 90

Note :— Attempt ONE question from each unit and the compulsory question.

UNIT—I

1. (a) Convert the following numbers as directed :

    (i) $(101101.101)_2$ to decimal

    (ii) $(237)_8$ to binary

    (iii) $(3F)_{16}$ to decimal

    (iv) $(1001101)_2$ to octal. $2\frac{1}{2} \times 4 = 10$

    (b) Explain the 1's and 2's complement method for representing negative numbers with examples.   8

2. (a) Perform the following binary arithmetic operations :

    (i) $(1101)_2 + (1011)_2$

    (ii) $(1100)_2 - (1001)_2$ using 2's complement

    (iii) $(101)_2 \times (11)_2$

    (iv) $(1100)_2 \div (10)_2$ $2\frac{1}{2} \times 4 = 10$

(b) Explain error detection and correction codes with examples. 8

UNIT—II

3. (a) Explain the characteristics of logic gates including fan-in, fan-out, power dissipation, and propagation delay. 9

(b) Simplify to Boolean expression using Karnaugh Map :
$F(A, B, C, D,) = \Sigma(0, 1, 3, 5, 7, 8, 9, 11, 15)$ 9

4. (a) Explain the working of universal gates with necessary diagrams and conversions. 9

(b) State and prove DeMorgan's Theorems with truth tables. 9

UNIT—III

5. (a) Design a full adder circuit using two half adders and an OR gate. 9

(b) Explain the working of a 4-to-16 decoder using 2-to-4 decoders. 9

6. (a) Explain the working of multiplexers and demultiplexers with applications. 9

(b) Differentiate between serial and parallel adders with suitable diagrams. 9

UNIT—IV

7. (a) Describe the working of JK Flip Flop and explain how race-around condition can be avoided. 9

   (b) Differentiate between synchronous and asynchronous counters. 9

8. (a) Explain the working of different types of shift registers with neat diagrams. 9

   (b) Design an up-down counter and explain its operation. 9

(Compulsory Question)

9. Answer the following in brief :

   (a) What is BCD code ? Give an example. 4

   (b) Explain the working of an excess-3 code. 4

   (c) Define the propagation delay in logic gates. 4

   (d) Differentiate between combinational and sequential circuits. 4

   (e) What is the significance of parity bits ? 2