

GANPAT UNIVERSITY
B. TECH SEM- III INFORMATION TECHNOLOGY
REGULAR EXAMINATION- NOV-DEC 2015
2IT302: COMPUTER SYSTEM ORGANIZATION

TIME: 3 HRS

TOTAL MARKS: 60

- Instructions:** (1) This Question paper has two sections. Attempt each section in separate answer book.
 (2) Figures on right indicate marks.
 (3) Be precise and to the point in answering the descriptive questions.

SECTION: I

Q.1 A. Convert the base of following numbers. Also show the process of base conversion. (6)

1. $(9012.10)_{10} = (\text{_____})_3$

2. $(345D.EC)_{16} = (\text{_____})_8$

3. $(65423.1)_8 = (\text{_____})_{10}$

B. Calculate $11010 - 1000$ using 2's complement. (2)

C. Express function $F(A, B, C) = B(A+C') + AC'$ in product of maxterms form. (2)

OR

Q.1 A. Convert the base of following numbers. Also show the process of base conversion. (6)

1. $(1010.101)_2 = (\text{_____})_{16}$

2. $(345C.AD)_{16} = (\text{_____})_{10}$

3. $(5489.12)_{10} = (\text{_____})_8$

B. Calculate $87456 - 5487$ using 10's complement. (2)

C. Express function $F(A,B,C) = (A+B')C + A'B$ in sum of minterms form. (2)

Q.2 A. Simplify $F(W, X, Y, Z) = \Sigma(0, 2, 4, 6, 8, 10)$ using K-map method. (4)

B. Show the implementation of full subtractor circuit. (4)

C. Write dual of following expressions using principle of duality. (2)

1. $X+1 = 1$

2. $X' + X = 1$

OR

Q.2 A. Design three variables combinational circuit which gives 1 in output if input is even number. (4)

B. Simplify $F(A, B, C, D) = \pi(1, 3, 5, 7, 9, 11, 12, 13, 14, 15)$ using K-map method. (4)

C. Write complement of following expressions. (2)

1. $F = A' + B(A+C')$

2. $F = BC' + (A'B'C)$

Q.3 A. Implement binary to excess-3 code convertor without using binary parallel adder. (6)

B. Minimize the Boolean function $F(A, B, C, D) = \Sigma(0, 5, 7, 8, 13, 15) + d(2, 4, 6, 10)$ using K-map method. (4)

SECTION: II

Q.4 A. Write equations to check $A > B$ and $A = B$ for two numbers A & B of four bits and draw the corresponding circuit diagram. (6)

B. Draw the truth table of octal to binary encoder and its circuit diagram. (4)

OR

Q.4 A. Design BCD to decimal decoder circuit. (6)

B. Design a circuit that finds 2's complement of 4 bit binary number. (4)

Q.5 A. Explain following instructions of 8085 microprocessor. (6)

1. LDAX 2. MVI 3. ADD

B. Design circuit for function $F(X, Y, Z) = \sum (0, 2, 4, 5, 7)$ using suitable multiplexer circuit. (4)

OR

Q.5 A. Design a counter that circularly counts 000 to 111 using T flip-flop. (6)

B. A memory location D100 contains AD data. Mask the bits D3, D5, D6 and D7 of that byte and store result to memory location D201. (4)

Q.6 A. Draw the circuit diagram of JK flip-flop and give its characteristic table. (6)

B. Identify addressing modes (Direct or Indirect or Immediate) of following 8085 instructions. (2)

1. MOV D, A 3. ANI 40

2. STAX H 4. SUB C

C. Express number -87.625 using IEEE-754 single precision floating point representation. (2)

-----END OF PAPER-----