Time- 3 Hours **Total Marks: 80**

Note:
1. Q. No. 1 is compulsory
2. Attempt any 3 from rest
3. Make suitable assumptions wherever required
4. Draw neat and clear diagrams
5. Write in legible handwriting
6. Figure to the right indicate full marks

Q.1 Answer any 4 questions 20

a. Convert the decimal number 2024 in to equivalent binary and octal number

b. Explain excess 3 codes and grey code with examples.

c. Explain 3 bits min and max terms with the help of data table.

d. Explain 3 bits digital register circuit in brief.

e. Explain the classification of logic family.

f. Explain random and sequential memory.

Q.2 a. Explain why NAND and NOR gates are called universal gates? 10

b. Explain in detail RCTL logic family with example with its advantages and disadvantages 10

Q.3 a. Write short note on the specifications of digital IC. 10

b. Implement the logic given by the following SOP expression using NAND gate

$f(A,B,C,D)=\sum m(0, 1,2,5,7,9,10,11,13,15)$ 10

Q.4 a. Design a logic circuit for two inputs half and full adder. 10

b. What is a multiplexer? Design a 16x1 multiplexer circuit using 4x1 multiplexers. 10

Q.5 a. Explain the working of any shift register with the help of suitable diagram. 10

b. Explain mode 10 counter with the help of suitable diagrams. 10

Q.6 Write short note on any two 20

a. R-2R Digital to analog converter

b. Successive approximation method of ADC

c. Memory Mapping and address decoding
