BACHELOR OF TECHNOLOGY (C.B.C.S.) (2020 COURSE)
B.Tech.Sem - III E&C : : SUMMER - 2022
SUBJECT : SWITCHING THEORY & LOGIC DESIGN

Day : Tuesday
Date : 31-05-2022

S-24593-2022

Time : 02:30 PM-05:30 PM
Max. Marks : 60

N.B.

1) All questions are **COMPULSORY**.
2) Figures to the **RIGHT** indicate **FULL** marks.
3) Use of non-programmable calculator is **ALLOWED**.
4) Assume suitable data **WHEREVER** necessary.

Q.1 Convert the following numbers from Decimal to Octal and then to binary. **(10)**
i) 375 ii) 249.

OR

Q.1 For the logic expression : $Y = A\overline{B} + \overline{A}B$, **(10)**

i) obtain the truth table
ii) name the operation performed
iii) realise this operation using AND, OR, NOT gates.

Q.2 Prove the following using De Morgans theorems : **(10)**

i) $AB + CD = \overline{\overline{AB}.\overline{CD}}$.

ii) $(A+B).(C+D) = \overline{\left(\overline{A+B} + \left(\overline{C+D}\right)\right)}$.

OR

Q.2 Minimize the following function and realise using minimum number of gates **(10)**
$F = \sum m(0,3,5,6,9,10,12,15)$.

Q.3 Design and explain full subtractor circuit using two half subtractors and realisation of full subtractor using NAND gates. **(10)**

OR

Q.3 Design a 32:1 multiplexer using two 16:1 multiplexer IC. **(10)**

Q.4 Design 3 bit Binary counter. **(10)**

OR

Q.4 Explain the operation of the bi-directional shift register. **(10)**

Q.5 Differentiate between **(10)**

i) RAM and ROM
ii) Volatile memory and non-volatile memory.

OR

Q.5 Explain any 5 characteristics of Digital IC. **(10)**

Q.6 Explain in detail VLSI design flow (with reference to EDA tool). **(10)**

OR

Q.6 Write short note on : **(10)**

i) data flow
ii) Structural modeling

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