Q.P. Code: 24573

K. G. C. E. EXAM KARJAT, RAIGAD

(3 Hours) **[Total Marks: 80**

N.B.: (1) Question No. **1** is **compulsory.**
(2) Solve any **three** questions out of remaining **five.**
(3) Figures to **right** indicate **full** marks.
(4) Assume suitable **data** where **necessary.**

Q1 Solve any **four** **(20)**

a) What are the important features of differential amplifier, also states its types.

b) State De'sMorgon theorem & implement OR gate using NAND gate only.

c) ADD $(83)_{10}$ & $(34)_{10}$ in **BCD**.

d) Convert S-R flip flop to D flip-flop.

e) State advantages & disadvantages of multiplexer.

f) Explain VHDL format in brief.

Q2. A) Simplify the following using Quine-Mcclusky method

$F(A,B,C,D) = \sum m(0,3,4,11,15) + d(1,2,5)$ **(10)**

B) Design & implement one digit BCD adder using IC 7483 **(10)**

Q3. A) Design **MOD-** 11 ripple counter using suitable flip-flop. **(7)**

B) Convert the following decimal number into binary, octal & hexadecimal

i) $(555)_{10}$ ii) $(138)_{10}$ iii) $(79)_{10}$ **(9)**

C) Why transistor biasing is required, state factors required for it **(4)**

Q4 A) Draw truth table of full subtractor & realize using 3-8 decoder **(10)**

B) Draw the circuit diagram of voltage divider bias circuit using CE configuration

And explain how it stabilizes the operating point **(10)**

Q5. a) Y=ABC+BC'D+A'BC & realize using gates **(6)**

a) Explain parallel I/P serial output shift register **(6)**
b) Minimize the following expression using **only one** 8:1 MUX.

$F(A,B,C,D) = \sum m(1,2,9,10,11,14,15)$ **(8)**

Q6. Write short notes on **any four** **(20)**

a) BCD & excess-3 codes
b) Current mirror circuit
c) Ring counter
d) ALU
e) Modelling styles in VHDL

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