Q. P. Code: 36192

(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
a)   i) Convert $(13.078125)_{10}$ to binary.
    ii) Convert $(B73D)_H$ into octal.
    iii) Convert $(436)_8$ into hexadecimal.
    iv) Convert $(845)_{10}$ into gray code. (4)

b) Sketch typical illumination characteristics for a photodiode and explain the theory of device. (4)

c) Derive the equation of stability factor for voltage divider bias circuit. (4)

d) Implement a full adder using 8:1 Demultiplexer. (4)

e) Write truth table and excitation table of JK flip flop. (4)

2. a) Explain inverting summing amplifier using op-amp. Derive the expression for output voltage. (8)

b) What are different methods used to improve CMRR in differential amplifier. (8)

c) Draw circuit diagram & waveforms of monostable multivibtrator using IC555. (4)

3. a) Design 2 bit magnitude comparator. (10)
  b) Using K-map realize the following expression
    $Y= \sum m\ (1, 3, 4, 5, 7, 9, 11, 13, 15)$ (5)

(c) Convert JK FF to D FF. (5)

4.a) With the help of neat circuit diagram explain the operation of Zener diode regulator for variable input voltage and variable load. (8)
  b) Explain dataflow modeling style with suitable example. (6)
  c) Compare schottky diode with PN junction diode (3 points) (6)

5. (a) Design a MOD-12 Asynchronous down counter. (8)
  (b) What do you mean by operational amplifier? Explain the block diagram of opamp. (8)
  (c) Write VHDL for full adder. (4)

6.(a) Write a short note on ASCII code and Excess-3 code. (8)
  (b) What do you mean by universal gate? Implement NOT,AND,OR gates using NAND gates only. (8)
  (c) Explain the difference between the integrator & differentiator .Give one application of each. (4)

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