

Q.2 a. Explain the formation of N-type and P-type semiconductors.

Answer: Page Number 11-12 of Text Book I.

b. Explain the forward and reverse characteristics of a PN junction diode.

Answer: Page Number 35-36 of Text Book I.

c. Calculate the resistivity of Si at 300K. If donor impurity to the extent of 1 part of 10^8 atoms of Si is added. Find the density of minority carriers and the resistivity.

Answer: Page Number 13 of Text Book I.

Q.3 a. Draw the circuit of bridge rectifier & explain its working with the waveforms. Also obtain the expression of its PIV and conversion efficiency.

Answer: Page Number 77-78 of Text Book I.

b. Draw the circuits of series clipping circuits and explain its working with waveforms.

Answer: Page Number 113-114 of Text Book I.

Q.4 a. Explain the operation of NPN transistor with neat diagrams and also discuss, its operating modes and applications.

Answer: Page Number 145-147 of Text Book I.

b. Draw the circuit of collector to base bias and explain. Also obtain the expression of its stability factor.

Answer: Page Number 192-193 of Text Book I.

Q.5 a. Explain the capacitor coupled two stage CE amplifier with a neat circuit diagram.

Answer: Page Number 485-486 of Text Book I.

b. Explain the effect of negative feedback on Input Impedance, Output Impedance and bandwidth of voltage series and current shunt feedback amplifier.

Answer: Page Number 581-582 of Text Book I.

Q.6 a. What are the advantages and limitations of digital techniques?

Answer: Page Number 6-7 of Text Book II.

b. Explain BCD code and compare it with binary code.

Answer: Page Number 38-39 of Text Book II.

c. Perform the following conversions:

(i) $(1001.101)_2 = ()_{10}, (10101)_2 = ()_{16}$

(ii) $(-42)_{10} = ()_{10}$

(iii) $(4FF)_{16} = ()_8$

Answer: (i) $(1001.101)_2 = (9.625)_{10}$
 $(10101)_2 = (15)_{16}$

(ii) $42 = (101010)$
 $-42 = 1010110$

(iii) $(4FF)_{16} = (010011111111)_2$
 $= (1377)_8$

d. What are gray codes? Discuss its properties and applications in digital systems. Convert $(11101)_2$ into gray code.

Answer: $(11101)_2 = 10011 \rightarrow$ Gray code.

Q.7 a. Explain the universality of NAND and NOR gates.

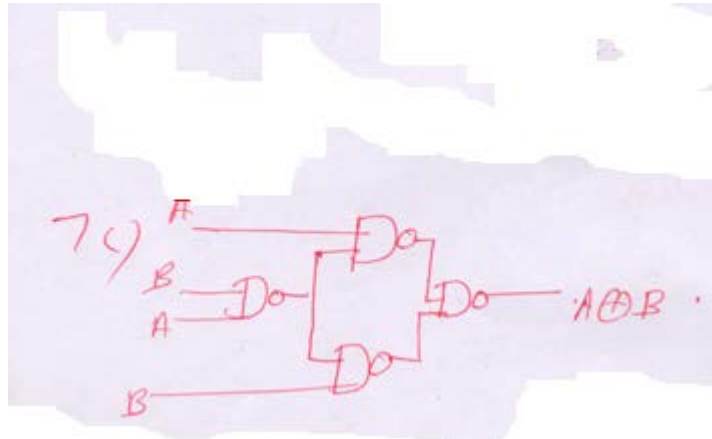
Answer: Page Number 83-84 of Text Book II.

b. Simplify the expression $y = \overline{C}(\overline{A}\overline{B}\overline{D} + D) + A\overline{B}C + \overline{D}$ using Karnaugh map.

Answer: Page Number 130-131 of Text Book II.

c. Implement two input XOR using four NAND gates only.

Answer:



Q.8 a. Draw the block diagram of a 5 bit parallel adder circuit and explain.

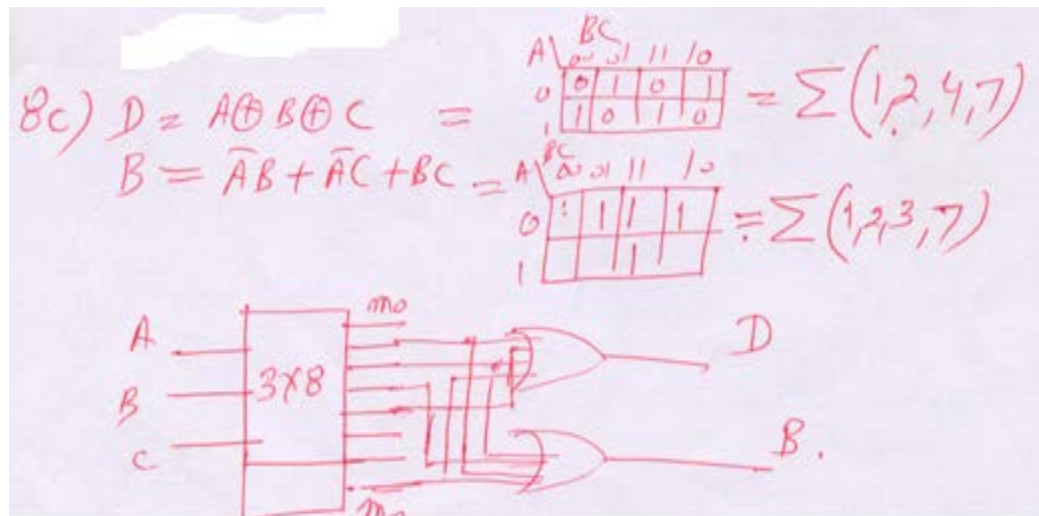
Answer: Page Number 283-285 of Text Book II.

b. What is a Decoder? Explain with a diagram the working of a 3 line to 8 line decoder.

Answer: Page Number 504-505 of Text Book II.

c. Implement full subtractor using 3×8 multiplexers.

Answer:



Q.9 a. Explain the working of a clocked D flip flop with neat diagram and waveforms. Implement T flip-flop using D flip-flop.

Answer: Page Number 201-202 of Text Book II.

b. Draw the diagram of a Mod-8 Counter and explain its working with waveforms.

Answer: Page Number 336-337 of Text Book II.

TEXT BOOKS

- 1) **Electronic Devices and Circuits by David A Bell, 5th Edition, Oxford University Press.**
- 2) **Digital Systems - Principles and Applications by Ronald J. Tocci & Neil S Widmer, 8th Edition of Pearson Education.**