KATHMANDU UNIVERSITY
First internal Examination [C]
July, 2017

Level : B.E.
Year : II
Time : 2 hrs. 30 mins.

Course : EEEG 202
Semester: II
F. M. : 55

SECTION "B"
[5 Q.× 11 = 55 marks]

Attempt *ANY FIVE* questions. Figure in the margin indicates the full mark. Students are required to answer in their own words as far as practicable. Calculators are not allowed.

1.

a) Using r's complement, perform the following subtraction:
(i) $(3250 - 72532)_{10}$ (ii) $(72532-3250)_{10}$ [3]
b) Convert $(3A4C.5B1)_{16}$ into decimal. [2]
c) Differentiate between weighted and un weighted number systems with suitable examples. [2]
d) Express the following Boolean function F = A + B'C in sum of minterms and product of maxterms. [4]

2.

a) Using K-map method, simplify the following Boolean function in (i) sum of products (ii) product of sums:
$F(A,B,C,D) = \sum(0,1,2,5,8,9,10)$ [5]
b) What is the significance of carry lookahead generator? Design a logic circuit for carry lookahead generator. [1+5]

3.

a) Mention some applications of decoder and draw a logic circuit for 3 to 8 line encoder. [1+3]
b) Write truth table and design logic circuit for 3 bit even parity generator. [5]
c) What are the advantages of digital system over analog system? [2]

4.

a) Design a logic circuit having four inputs A,B,C,D whose output is high whenever both A and B are high as long as C and D are either both low or both high. Implement the circuit using NAND gate only. [5]

b) Write short notes on: [3 ×2]
i) Johnson counter
ii) Master slave flip-flop

5.

a) Write some application of flip-flops. Derive the characteristic equation of T flip-flop and convert the JK flip-flop into D flip-flopwith the help of excitation table. [1+5]
(b) Design a logic circuit for mod-8 asynchronous up/down counters using X-OR gate and explain the operation in detail. [5]

6.

a) Explain the working of parallel in serial out shift register with circuit diagram. [5]
b) A sequential circuit has two T flip-flops A and B, one input X and output Y. The circuit is described by the following flip-flop input output equations:
T_A = BX, TB = X and Y = AB. Draw the state table and state diagram of the circuit. [6]