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SF-6469

B. E. - II (Sem. IV) (Comp.) Examination

May / June - 2011

Digital Electronics

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ B. E. - 2 (SEM. 4) (COMP.)

Name of the Subject :

☛ DIGITAL ELECTRONICS

☛ Subject Code No. : 6 4 6 9 ☛ Section No. (1, 2,.....) : NIL

Seat No. :

Student's Signature

(2) Attempt all questions.

(3) Assume data if necessary.

1 (a) Do as directed : **10**

(i) Convert $(10101)_2$ to decimal.

(ii) Multiply $(1011.101)_2$ by $(101.01)_2$.

(iii) Define : Combinational circuit.

(iv) Convert binary to gray code 1001.

(v) Implement X-OR using NAND gate.

(b) Design 5 × 32 decoder using four 3x8 decoder and one 2 × 4 decoder. **8**

2 Any two : **14**

(i) Design BCD adder.

(ii) Implement universal gates

(iii) Explain decoder, demux, encoder, mux.

3 Any three : **18**

(i) Design and implement a 4 bit graf to binary converter.

(ii) Draw 4 bit magnitude comparator

(iii) Implement a full adder circuit with a decoder and two or gates.

(iv) Implement the following function with a multiplexer
F(A, B, C, D) = $\sum(0, 1, 3, 4, 8, 9, 15)$

4 (a) Answer the following : **10**

(i) a sequential circuit is one, whose output depends on _____.
   (a) Present inputs
   (b) present states
   (c) both
   (d) none

(ii) The characteristics equation of JK flip-flop is
   (a) $J\overline{Q} + K\overline{Q}$
   (b) $J\overline{Q} + \overline{K}Q$
   (c) $\overline{J}Q + K\overline{Q}$
   (d) $\overline{J}Q + K\overline{Q}$

(iii) How many number of flip-flops are used in master slave flip-flop ?
   (a) Two
   (b) Three
   (c) One
   (d) Four

(iv) If the value of R and S are 0,1 respectively then the present state and next states are
   (a) 1,1
   (b) 0,0
   (c) 0,1
   (d) 1,0

(v) A counter with 6 flip-flop can have the maximum number of states are :
   (a) 6
   (b) 256
   (c) 64
   (d) 8

(vi) If J = X and K = 1 what are the present state and next states ?
   (a) 0, 1
   (b) 1, 0
   (c) 0,0
   (d) 1,1

(vii) Which of the following is an example of a sequential circuit _____ ?
   (a) Parallel adder
   (b) Serial adder
   (c) BCD adder
   (d) Look ahead adder

(viii) In _____ type of register we have access only to left most and right most flip-flops
(a) Serial in serial out
(b) Serial in - parallel out
(c) parallel in - serial out
(d) Parallel in - serial out

(ix) A digital circuit used for counting pulses is known as
(a) Counter
(b) FF
(c) Register

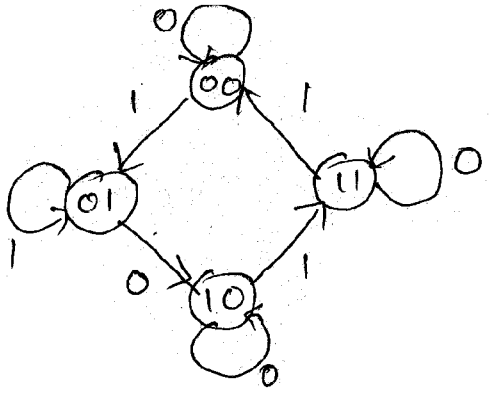
(x) Johnson's counter is also called as _____ ring counter.

(b) Convert SR flip-flop to J K Flip-flop. **5**

(c) Write down difference between combinational circuits and sequential circuits with example.

5 (a) What is race around condition ? How it solve ? Explain with master share JK flip/flop ? **7**

(b) Write state table derive state equation and design sequential circuits using J K Flip-flop for following state diagram. **8**



OR

5 (a) Explain state reduction and state assignment using example. **7**

(b) Explain edge-triggered flip-flop. **8**

6 (a) Explain Bidirectional shift register with parallel load. **8**

(b) Design a synchronous BCD counter using T-flip.flop. **7**

OR

6 (a) Design a 4-bit BCD ripple counter. **8**

(b) Explain serial transfer using shift register. **8**