BTS 165 (G)

B.TECH. DEGREE III SEMESTER (SUPPLEMENTARY) EXAMINATION IN
INFORMATION TECHNOLOGY/COMPUTER SCIENCE AND ENGINEERING
JUNE 2002

IT/CS 304 DIGITAL CIRCUITS AND
LOGIC DESIGN
(1995 Admissions)

Time: 3 Hours   Maximum Marks: 100

I.   (a)   Convert the following decimal numbers to binary:
              (i)   12·0625   (ii)   673·23   (2 x 5 = 10)
       (b)   Convert the following binary numbers to decimal:
              (i)   1110101·110
              (ii)   1101101·111   (2 x 5 = 10)
                                    OR
II.   (a)   Convert the following numbers to decimal, octal and binary.
              (i) $(2AC5·D)_{16}$ (ii) $(F329)_{16}$ (12)
       (b)   Explain various error detecting and error correcting codes.   (8)

III.   (a)   Simplify the Boolean function using k-map.
              $$f(w,x,y,z) = \Sigma(0,1,2,4,5,6,8,9,12,13,14)$$ (10)
       (b)   Design a 3 to 8 line decoder and show its truth table.   (10)
                                    OR
IV.   Implement a full adder circuit with a decoder and two OR gates.   (20)

V.   (a)   Explain tristate logic and its application.   (10)
       (b)   Draw the circuit diagram of a basic 2 inputs NAND gate in TTL and explain
              its operation.   (10)
                                    OR
VI.   (a)   Explain the techniques for interfacing TTL to CMOS and CMOS to TTL.   (10)
       (b)   List out the specification(s) of the TTL logic family.   (10)

VII.   (a)   Using a suitable diagram, explain the working of a master slave J - K Flip-Flop.
              Explain how race around condition is eliminated.   (10)
       (b)   With a circuit diagram explain the working of a modulo-8 counter.   (10)
                                    OR
VIII. (a)   Draw the circuit of a Johnson counter. Explain its operation.   (10)
       (b)   What are the difference(s) between synchronous and asynchronous digital logic
              circuits?   (10)

IX.   (a)   Explain the application(s) of ROMs and RAMs.   (10)
       (b)   Explain how write operation takes place in a magnetic core memory.   (10)
                                    OR
X.   (a)   Explain the principle and use of PLA.   (10)
       (b)   With a logic diagram, explain 74157 two input data selector/multiplexer.   (10)

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