DLA

DURATION: - 2½ hrs 712021223 MARKS:- 75

Note: - (1) All questions are compulsory.
(2) All questions carry equal marks.
(3) Figures to the right indicates full marks

Q.1 Attempt Any 3 15M

a) Draw Truth-table of basic gates with its symbol and logical Expression CO1-U

b) Write the rule of binary addition, binary multiplication, and subtraction CO1-U

c) Convert the following number system CO1-U
i) $(105)_{10} = (\_\_\_\_\_)_2$
ii) $(11011)_2 = (\_)_{10}$

d) Draw block diagram of fulladder, with its Truth-table and logical implementation CO2-R

e) Explain two bit comparator with Truth-table CO2-R

f) Explain 3:8 decoder with Truth-table CO2-R

Q.2 Attempt Any 3 15M

a) Solve using k map $y = \sum m\,(0,1,3,5)$ CO1-R

b) What is universal Gate, why it is called so CO2-U

c) Implement basic gate using NOR gate CO2-R

d) Design 1:8 Demultiplexor with its Truth-table and implementation CO2-R

e) Design and implement Binary to Gray code convertor CO4-R

f) Compare combinational and sequential logic circuit CO3-R

Q.3) Attempt Any 3 15M

a) Explain SISO shift register CO4-U

b) Explain with b1ock diagram J-K flip-flop CO4-U

c) Write the Expression in standard SOP form; CO3-U
$y = \bar{A}BC + AB + AC + \bar{A}\bar{C} + \bar{A}B$

d) Write the logical expression in canonical form for the Truth-table given below: CO3-U

A	B	C	y
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

e) Implement following expression using basic gate — CO2-U
   i) $y = \bar{A}BC + \bar{A}B\bar{C} + ABC + A\bar{B}C$
   ii) $y = A\bar{B} + ABC + \bar{A}\bar{B}\bar{C} + ACD$

f) Write a short notes on Binary Anathematic and logic unit — CO5-U

15M

Q.4) Attempt Any 3

a) Data bits 1011 have to be transmitted. Construct the odd parity 7 bit hamming code for given data — CO1-U

b) Explain multiplexer with its type — CO3-U

c) Explain binary multiplication and division Algorithm — CO5-U

d) State and proof Demorgan's theorem — CO2-R

e) Design 4 bit ripple counter — CO3-R

f) Design 3 bit Asynchronous up counter

15M

Q.5) Attempt Any 3

a) Draw and explain the block diagram of combination of circuit, Enlist example — CO2-R

b) Proof the following using basic boolean's law — CO1-R
   i) $A + AB = A$ ii) $A + \bar{A}B = A + B$

c) Compare Encoder and Decoder — CO4-U

d) Write a short notes on: "Error Detection & Error Correction" — CO2-U

e) Draw block diagram of 4:1mux with Truth-table and logical implementation — CO3-R

f) Enlist "Boolean laws" — CO1-U

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