

DURATION: - 2½ hrs

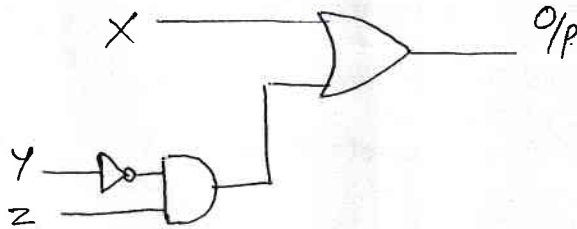
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MARKS:- 75

- 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) State and Prove "Demorgan's theorem" CO1-U
 - b) Compare "Analog system & Digital System" CO1-U
 - c) What is Comparator, Explain the working of 1 bit comparator with its truth-table and implementation CO2-R
 - d) Compare Multiplexer and Demultiplexer CO2-R
 - e) Solve using kmap $y = \sum m(0,2,5,7,13,15)$ CO2-U
 - f) Write the expression in std SOP form $y = \bar{A}BC + ABC + AC + AB$ CO2-R
- Q.2 Attempt Any 3** 15M
- a) Write a short notes on Error correction & detection code CO1-U
 - b) A seven bit even parity hamming code is received as 1110101. What is the Correct Code? CO1-R
 - c) Draw symbol and Write truth-table of basic gate and universal gate CO1-U
 - d) Prove using Boolean Expression CO1-U
 - i) $A + AB = A$
 - ii) $(A + B)(A + C) = A + BC$
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- e) Implement basic gate using NAND gate CO1-U
 - f) Why NAND & NOR gate is called universal gate CO2-R
- Q.3) Attempt Any 3** 15M
- a) Design and implement Binary to gary code converter circuit. CO3-U
 - b) Write a short notes on 'Decoder', Draw and Explain block diagram of 2:4 line Decoder CO3-U
 - c) What is flip-flop? Write the name of different type of flip-flop. CO4-R
 - d) Explain working of SR flip-flop. CO4-R
 - e) Write a short notes on Demultiplexer CO3-U
 - f) Draw the symbol of different type of shift Register. Explain the working of any 1. CO4-R
- Q.4) Attempt Any 3** 15M

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| a) Compare synchronous counter and Asynchronous counter | CO4-U |
| b) Design full subtractor with its Truth table and logical implementation | CO3-R |
| c) Write the Expression in standard SOP form
$y = \bar{A}BC + ABCD + AC + ABD + \bar{A}D$ | CO2-U |
| d) Explain sequential circuit with block diagram, also Enlist the application of sequential circuit | CO4-R |
| e) Design 2 bit Synchronous up counter with Truth-table and Timing diagram | CO4-R |
| f) Design 3 bit Asynchronous down counter | |
| Q.5) Attempt Any 3 | 15M |
| a) What is K-map, Draw the structure of two, three and four variable K map. Enlist the rule of grouping | CO2-U |
| b) i) Write 2's complement of i) 0011010 ii) 110111010 | CO1-R |
| ii) Define odd and Even parity with Ex. | |
| c) Define the term i) Bit ii) Nibble iii) Word iv) Double word | CO1-R |
| d) Data bit 1011 have to be transmitted. Construct the odd parity 7 bit hamming code for given data | CO1-R |
| e) Write the Boolean Expression for the Following logic circuit | CO2-U |



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| f) Write a short notes on "look ahead generator" | CO5-U |
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