

F.Y.BSc IT
Semester I
Digital Electronics

TIME: 2 1/2 HOURS

MARKS: 75

N.B: ALL QUESTIONS ARE COMPUSORY
FIGURES TO THE RIGHT INDICATE FULL MARKS.



Q.1 ANSWER THE FOLLOWING (ANY THREE): **15**

- A) Convert the following:
 $(625.75)_{10} = ?_{16} = ?_2 = ?_8$
- B) Solve the following using one's compliment method
 $(1010)_2 - (10010)_2$
- C) Solve the following using two's compliment method
 $(110010)_2 - (10010)_2$
- D) Describe binary subtraction with the help of an example
- E) Explain digital system
- F) Explain the Gray code

Q.2 ANSWER THE FOLLOWING (ANY THREE): **15**

- A) Explain, 'NOR is a universal gate'
- B) Solve the following using K-MAP and draw the circuit diagram:
 $y = \sum m (2, 3, 6, 7, 10, 14)$
- C) Solve the following using K-MAP and draw the circuit diagram:
 $y = \prod m (10, 11, 12, 13, 14, 15)$
- D) Explain Tabular method with the help of an example
- E) Describe XNOR gates
- F) Explain De Morgan's theorem

Q.3 ANSWER THE FOLLOWING (ANY THREE): **15**

- A) Design a 16-bit adder using 8 bit adders
- B) Describe the binary adder
- C) Explain the working of Excess-3 adder
- D) Explain the working of half adder
- E) Explain the process of code conversion with an example
- F) Explain the working of Comparator

Q.4 ANSWER THE FOLLOWING (ANY THREE): **15**

- A) Describe the ALU circuit
- B) Explain the working Encoders
- C) Design an 16:1 multiplexer using 8:1 multiplexer
- D) Solve using multiplexer
 $Y = \sum (5, 6, 8, 9, 10, 12)$
- E) Describe T flip flop
- F) Describe the SR flip flop

Q.5 WRITE NOTES ON (ANY THREE): **15**

- A) Synchronous counter
- B) Mode-16 counter
- C) Parallel-in-Serial-Out register
- D) Ring counter
- E) Applications of registers
- F) Left shift register