



## Analog & Digital Electronics (173102)

P. Pages : 2

Time : Three Hours

Max. Marks : 80

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answer sheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any two** from each unit. All units are compulsory.
5. Assume suitable data if necessary.
6. Use of non - programmable calculator is allowed.
7. Figures to right indicate full marks.
8. Draw diagram wherever necessary.

### UNIT - I

1. a) Find out the voltage expression of inverting summing amplifier circuit. 8  
b) Describe briefly V to I & I to V convertor ? 8  
c) Explain basic & practical integrator circuit ? 8

### UNIT - II

2. a) Explain operation of Schmitt trigger circuit ? 8  
b) Explain the operation of comparator circuit ? 8  
c) For astable multivibrator using IC 555 if  $R_A = 2.2k \Omega$ ,  $R_B = 6.8k \Omega$ ,  $C = 0.01 \mu f$  calculate  $T_{ON}$ ,  $T_{OFF}$ , free running frequency & duty cycle D. 8

### UNIT - III

3. a) Prove the following using De - Morgan's theorem. 8  
i)  $AB + CD = \overline{\overline{AB} \cdot \overline{CD}}$   
ii)  $(A + B) \cdot (C + D) = \overline{(\overline{A + B}) + (\overline{C + D})}$

- b) Prove the following 8
- i)  $A + \bar{A}B + A\bar{B} = A + B$
- ii)  $AB + \bar{A}B + \bar{A}\bar{B} = \bar{A} + B$
- c) Implement basic gates using universal gate. 8

#### UNIT - IV

4. a) Explain Half adder & Half subtractor. 8
- b) Make a K - map for the following function. 8
- $f = AB + A\bar{C} + C + AD + A\bar{B}C + ABC$   
& implement using NAND gate only.
- c) Convertor the following into standard form 8
- i)  $A + AB + BC$
- ii)  $PQ + R + PR$
- iii)  $(A + B)(B + C)$
- iv)  $(P + \bar{Q})(P + R)$

#### UNIT - V

5. a) Write short notes on 8
- i) MUX ii) Demultiplexer
- b) Implement following using 4 : 1 MUX 8
- i)  $f(A, B, C, D) = \sum m(2, 3, 5, 7, 8, 9, 12, 13, 14, 15)$
- ii)  $f(A, B, C, D) = \sum m(1, 3, 6, 8, 10, 11, 15)$
- c) Implement the full subtractor using 1 : 8 demultiplexer 8

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