U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

May 2023 Semester End Main Examinations

Programme: B.E. **Semester: I / II**
Branch: Common to all Branches **Duration: 3 hrs.**
Course Code: 18EC1ESECE / 18EC2ESECE **Max Marks: 100**
Course: Elements of Electronics Engineering **Date: 13.05.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - I

1	a)	Draw V-I Characteristics of diode and Indentify knee voltage and breakdown voltage on it. Define Knee voltage, breakdown voltage and PIV.	**05**
	b)	Derive the efficiency of a rectifier which has a ripple factor of 0.48 and PIV of individual diode is Vm. Draw the rectifier circuit.	**10**
	c)	A half wave rectifier is used to supply 50 V DC to a resitance load of 800 Ω. The diode has a resistance of 25Ω. Calculate maximum ac voltage required (Assume diode is ideal).	**05**

OR

2	a)	Describe how zener diode used as voltage regulator.	**07**
	b)	Explain how capacitor filter is used to reduce the ripple content of rectifier output.	**06**
	c)	Derive the expression for ripple factor of a full wave rectifier.	**07**

UNIT - II

3	a)	Discuss the voltage divider biasing for transistor amplifer with relevant equations.	**08**
	b)	Draw the circuit diagram of RC coupled transistor amplifer and explain its operation. Draw the frequency response curve of RC coupled amplifer.	**08**
	c)	The collector current of a transistor is 100 mA and β is 75. Caculate the value of base current and emitter current.	**04**

UNIT - III

4	a)	Explain the working principle of RC phase shift oscillator using neat circuit diagram.	**08**

b) Describe how OP-AMP can used as i) Summing Amplifier ii) Integrator **08**

c) For an inverting amplifer R_i=100 KΩ and R_f=600 KΩ. What is the output voltage for an input of -3V ? **04**

UNIT - IV

5 a) Simplify and realize using NAND gate only. **06**

i) $y = ABC + AB'C + ABC' + A'BC$

ii) $y = AB + A'BC + AC' + A'B'C$

b) Design a full adder using two half adders. **08**

c) Explain the operation of JK Flip flip using state table. **06**

OR

6 a) Simplify the below expression using K-Map. **06**

$i) F = xy' + x'y'z + xyz'$

$ii) F = a'b'c' + a'bc' + a'bc + ab'c + abc'$

b) Implement a 4x1 multiplexer using 2x1 Mux. Explain the concept. **06**

c) Design a full adder using 3 to 8 decoder. **08**

UNIT - V

7 a) Explain the digital communication system using block diagram. **08**

b) Briefly discuss the concept of Internet of things using suitable block diagram. **08**

c) What is GPS system ? Explain **04**

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