18ELN14/24

Visvesvaraya Technological University, Belagavi

MODEL QUESTION PAPER

1st/2nd Semester, B.E (CBCS 2018-19 Scheme)

Course: 18ELN14/24- BASIC ELECTRONICS − *Set no. 2*

Time: 3 Hours   **Max. Marks: 100**

Note: (i) Answer Five full questions selecting any one full question from each Module.
(ii) Question on a topic of a Module may appear in either its 1st or/and 2nd question.

		Module-1	**Marks**
1	a.	Explain the operation of PN junction diode under forward and reverse bias conditions	6M
	b.	A full wave bridge rectifier with an input of 100V(rms) feeds a load of 1kΩ .V_T=0.7V (i) If the diodes employed are of silicon, what is the dc voltage across the load? (ii) Determine the PIV rating of each diode.. (iii) Determine the maximum current that each diode conducts and the diode power rating.	6M
	c.	Write a short note on (i) Light emitting diode and (ii) Photo coupler	8M
		OR	
2	a.	What is Zener diode? With neat circuit diagram, explain the operation of a voltage regulator with and without load?	8M
	b.	A silicon diode has I_S=10nA operating at 25°C. Calculate I_n for a forward bias of 0.6V.	4M
	c.	Define rectifier. Sketch a centre tapped full wave rectifier and derive the following. Show the appropriate waveforms. (i) Average Voltage (ii) Efficiency and (iii) Ripple factor	8M
		Module-2	
3	a.	Explain the construction and operation of JFET with necessary diagram.	7M
	b.	Draw and explain the V-I characteristics of SCR.	6M
	c.	With neat circuit diagram, explain the working of CMOS inverter.	7M
		OR	
4	a.	What is MOSFET? Explain D- MOSFET and E- MOSFET transfer characteristics.	8M
	b.	A certain JFET has an I_{GSS} of -2nA for V_{GS}= -20V Determine the input resistance.	4M
	c.	What is SCR? Explain the working of two transistor model of SCR.	6M
		Module-3	
5	a.	Describe the characteristics of basic Op-Amp. List out its ideal characteristics.	8M
	b.	A certain op-amp has an open loop voltage gain of 1,00,000 and a common mode gain of 0.2. Determine the CMRR and express it in decibels.	4M
	c.	Derive the output voltage for the following (i) Integrator and (ii) Voltage follower	8M

		OR	
6	a.	Explain the following terms related to op-amp (i) CMRR (ii) Offest Voltage and Current (iii) Slew rate and (iv) Input bias	8M
	b.	Design an adder using op-amp to give the output voltage $V_O = -[2V_1 + 3V_2 + 5V_3]$.	6M
	c.	Derive the output voltage of a non-inverting amplifier.	6M
		Module-4	
7	a.	What is an amplifier? Explain the operation of transistor amplifier circuit.	8M
	b.	Define feedback amplifier? With necessary diagram and equation explain the different types of feedback?	12M
		OR	
8	a.	Briefly explain how a transistor is used as an electronic switch.	6M
	b.	Explain how 555 timer can be used as an oscillator.	6M
	c.	Define an oscillator? Derive the equation for Wien bridge oscillator.	8M
		Module-5	
9	a.	Perform the following (i) Convert $(A B C D)_{16} = (?)_2 = (?)_8 = (?)_{10}$ (ii) Subtract $(1010)_2 - (111)_2$ using 2's compliment method.	5M
	b.	Realize Y=AB+CD+E using NAND gates.	4M
	c.	What is a flip flop? Explain the Master Slave JK flip flop operation.	5M
	d.	With a neat block diagram explain GSM system.	6M
		OR	
10	a.	Perform the following (i) Convert $(111110101101)_2$ to $(\ )_8$ (ii) Subtract $(22)_2 - (17)_2$ using 1's and 2's compliment method.	5M
	b.	Design full adder circuit using three variables and implement it using two half adders.	8M
	c.	What is a counter? With a neat timing and block diagram, explain three bit asynchronous counter operation.	7M

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