18ELN14/24

Visvesvaraya Technological University, Belagavi

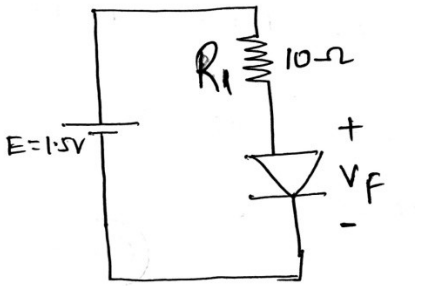
MODEL QUESTION PAPER

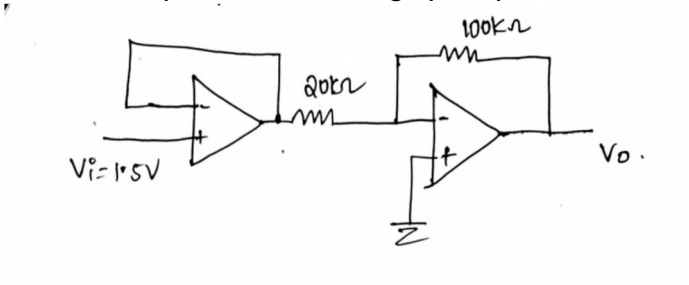
1st/2nd Semester, B.E (CBCS 2018-19 Scheme)

Course: 18ELN14/24- BASIC ELECTRONICS – *Set no.1*

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 p-n junction diode under forward and reverse biased condition	8
	b	Explain how Zener diode can be used as a voltage regulator	6
	c	A diode circuit shown below has E=1.5V, R_1=10 ohm. By assuming V_f=0.7V, calculate I_f for i) $r_d = 0$ ii) r_d = 0.25 ohm  Fig.Q.1(c)	6
		OR	
2	a	With a neat circuit diagram and waveform, explain the working of half-wave rectifier and derive the expression for average load current.	8
	b	Explain briefly the operation of a capacitor filter circuit.	6
	c	Explain the operation of 7805 fixed IC voltage regulator.	6
		Module-2	

3	a	Explain the characteristics of N-channel JFET.	8
	b	For E-MOSFET, determine value of I_D, if I_D (ON)= 4mA, V_{gs}(ON)=6V, V_T=4V and V_{gs}=8V.	4
	c	Explain the construction and working of P-channel enhancement type MOSFET.	8
		OR	
4	a	Draw and explain the operations of SCR using 2-transistor equivalent circuit.	8
	b	Explain phase controlled application of SCR.	6
	c	Explain the operation of a CMOS inverter.	6
		Module-3	
5	a	For an op-amp (i) List the characteristics of an ideal op-amp and (ii) Draw the three input inverting summer circuit and derive an expression for its output voltage.	8
	b	Define the terms i) Slew rate ii) CMRR iii) Common mode gain A_C of op-amp	6
	c	Design an adder circuit using an op-amp to obtain an output voltage of V_o= -[$2V_1$+$3V_2$+$5V_3$]	6
		OR	
6	a	Draw the working of an inverting op-amp. Derive the expression for its voltage gain.	8
	b	With a neat diagram, explain how an op-amp can be used as a differentiator.	6
	c	Find the output V_o of following op-amp circuit.  Fig.Q.6(c)	6

		Module-4	
7	a	Explain the operation of BJT as an amplifier and as a switch.	8
	b	What is a feedback amplifier? Briefly explain different types of feedback amplifiers.	6
	c	Draw and explain the operation of a voltage series feedback amplifier and derive an expression for its voltage gain with feedback.	6
		OR	
8	a	Explain the Barkhausens' criteria for oscillations.	6
	b	Explain the operation of an RC phase shift oscillator.	6
	c	Explain the working of an Astable oscillator constructed using IC- 555 timer.	8
		Module-5	
9	a	Convert the following. i) $(725.25)_{10}=(\ ?\ )_2 = (\ ?\ )_{16}$ ii) $(111100111110001)_2= (\ ?\ )_{10} = (\ ?\ )_{16}$	8
	b	Simplify the following expressions and draw the logic circuits using basic gates. i) AB+$\acute{A}C+A\acute{B}C$ (AB+C) ii) (A+$\acute{B}$)(CD+E)	6
	c	Realize a full adder circuit using 2 half adders.	6
		OR	
10	a	What is a multiplexer? Explain the working of 4:1 multiplexer.	6
	b	With the help of a logic diagram and truth table, explain the working of a clocked SR flip-flop.	6
	c	What is a shift register? Explain the working of a 4-bit SISO shift register.	8

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