Total No. of Questions – [3] Total No. of Printed Pages: 04

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PAPER CODE	U112-203B (Reg)

DECEMBER 2022 (INSEM+ ENDSEM) EXAM

F.Y. B. TECH. (SEMESTER - I)

COURSE NAME: BASIC ELECTRONICS ENGINEERING

COURSE CODE: ET10203B

(PATTERN 2020)

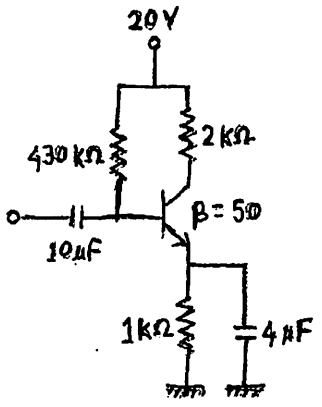
Time: [2Hr] [Max. Marks: 60]

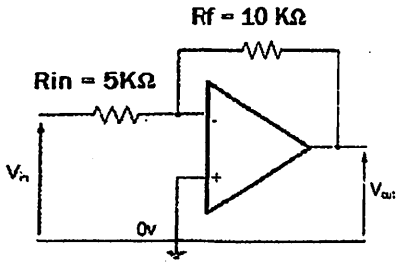
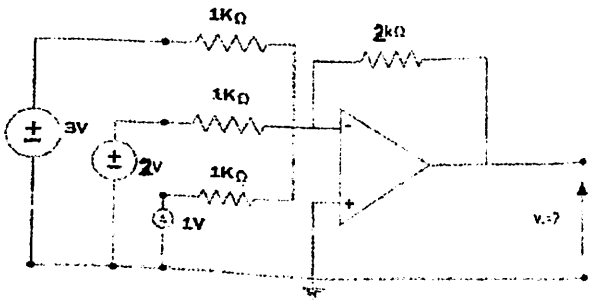
(*) Instructions to candidates:

1) **Figures to the right indicate full marks.**
2) **Use of scientific calculator is allowed**
3) **Use suitable data where ever required**

Question No.	Question Description	Marks	CO mapped	Blooms Taxonomy Level
Q.1	i) Determine the peak output voltage for the full wave bridge rectifier. Assume silicon diode. The transformer is specified to have a 10 V rms secondary voltage and 120 V across the primary winding. a) 8.6 V b) 12.74 V c) 14.14 V d) 13.44 V	[2]	CO1	Apply
	ii) The potential drop in full wave bridge rectifier is _____ a) 1.1V b) 1.2V c) 1.3V d) 1.4V	[2]	CO1	Apply
	iii) What happens to the diode when the positive voltages are applied at anode? a) Diode gets forward biased b) Diode begin to conduct c) Depletion region becomes smaller d) All of the above	[2]	CO1	Understand
	iv) A forward potential of 10V is applied to a Si diode. A resistance of 10 KΩ is also in series with the diode (Assume practical diode	[2]	CO1	Apply

	model). The current is---------- a) 0.93 mA b) 10 mA c) 1 mA d) 0.7 mA			
	v) Semiconductor undergoing the process of doping are classified as a) intrinsic semiconductor b) extrinsic semiconductor c) both a and b d) none of the above	[2]	CO1	Understa nd
	vi) Unidirectional current of diode is termed as _____ a) Amplification b) modulation c) rectification d) none of the above	[2]	CO1	Understa n
	vii) The cut in or the Knee voltage of the silicon diode is _____. a) 1V b) 0.5V c) 0.7V d) 0.8V	[2]	CO1	Understa nd
	viii) _____ is the maximum reverse potential that a diode can withstand a) Maximum power dissipation b) Forward voltage drop c) Peak inverse voltage d) Average forward current	[2]	CO1	Understa nd
	ix) The current gain (β) of a transistor in common emitter configuration is 40. If the collector current changes by 160 mA, then required change in the base current is .....for constant V_{CE} a) 4 mA b) 0.4 mA c) 40 mA d) 4 A	[2]	CO2	Apply
	x) In a fixed bias circuit silicon NPN transistor (CE) with β = 90 is used. If Vcc = 15 V, Rc = 3 KΩ and Rb = 1 MΩ , the VCE at Q-point is given as: a) 12.41 V b) 7.5 V c) 10 V d) 11.6 V	[2]	CO2	Apply

	xi) Determine saturation current for the following circuit: ($V_{CE(sat)}$ = 0.2 V, V_{BE} = 0.7V)  a) 10 mA b) 6.67 mA c) 20 mA d) 0 mA	[2]	CO2	Apply
	xii) Which of the following method of biasing provides the best operating point stability? a) Two battery bias b) Base bias c) Collector feedback bias d) Voltage divider bias	[2]	CO2	Understand
	xiii) In NPN transistor, operating in saturated mode, the value of output voltage V_{CE} is _____ a) Less than V_{BE} b) Greater than V_{BE} c) Less than $2V_{BE}$ and greater than V_{BE} d) Equal to V_{BE}	[2]	CO2	Understand
	xiv) In how many regions can the biased transistor work a) Four b) Two c) Three d) Five	[2]	CO2	Understand
	xv) Calculate the value of emitter current for a transistor with α_{dc} = 0.98, I_{CBO} = 5 μA and I_B = 95 μA. a) 4.5 mA b) 4 mA c) 3.5 mA d) 5 mA	[2]	CO2	Apply

Q2	**Solve any three out of four**			
	a) Calculate V_{GS} and V_{DS} for the circuit, with R_1=100 KΩ , R_2=20 KΩ, R_D= 100 Ω, Rs=0 Ω , V_{DD} = 25 V. Assume this particular MOSFET has minimum values of $I_{D(on)}$ = 300 mA at V_{GS} = 4 V and $V_{GS(th)}$ = 1.5 V.	[5]	CO3	Apply
	b) Sketch internal structure and V-I characteristics of TRIAC and explain its working?	[5]	CO3	Understand
	c) Sketch n-channel MOSFET constructional diagram and explain the pinch-off process?	[5]	CO3	Understand
	d) With the help of V-I characteristics of SCR, explain the turn-on process for SCR?	[5]	CO3	Understand
Q.3	**Solve any three out of four**			
	a) Calculate closed loop gain of the circuit shown below and find out its output voltage if 2.5 Vdc input is applied to the circuit 	[5]	CO4	Analyze
	b) With the help of diagram explain the working of OPAMP as non-inverting comparator?	[5]	CO4	Understand
	c) Calculate the output voltage for the circuit shown in the figure 	[5]	CO4	Analyze
	d) With the help of suitable diagram explain the following i) Slew rate ii) Virtual ground	[5]	CO4	Understand