PAPER ID-421107

Subject Code: KEC201T

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM II) THEORY EXAMINATION 2021-22
EMERGING DOMAIN IN ELECTRONICS ENGINEERING

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If you require any missing data, then choose suitably.

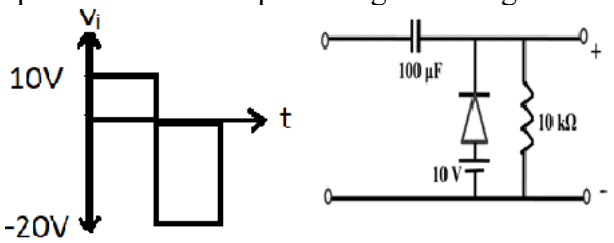
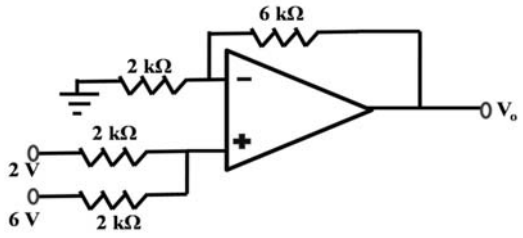
SECTION A

1. Attempt *all* questions in brief. 2*10 = 20

Qno	Questions	CO
(a)	Discuss the formation of depletion layer in diode.	1
(b)	Explain the effect of temperature on diode.	1
(c)	What is difference between BJT and JFET.	2
(d)	Determine β_{dc} and I_{CBO} , If I_E = 6mA, I_C = 5.92mA and I_{CEO}=200mA.	2
(e)	What do you mean by CMRR in OP-AMP.	3
(f)	Which is better among microprocessor or microcontroller? Justify your answer with valid reason.	3
(g)	Determine base of the following: (i) $(345)_{10}=(531)_x$ (ii) $(2374)_{16}= (9076)_x$	4
(h)	Write the truth table of two input X-OR gate and two input X-NOR gate.	4
(i)	Calculate the transmission efficiency if the modulation factor is 0.5.	5
(j)	Enlist the merits of satellite communication.	5

SECTION B

2. Attempt any *three* of the following: 10*3 = 30

Qno	Questions	CO
(a)	Define Clamper. Determine output voltage for the given network. 	1
(b)	Draw and explain common base N-P-N Transistor with its input and output characteristic graph. Also write an expression for output current.	2
(c)	Explain the concept of virtual ground in OP-AMP. Determine output Voltage for given network. 	3
(d)	Perform following operation as indicated. (i) Determine2's complement of $(1010.110)_2$. (ii) Convert $(25.125)_{10}$ into Hexadecimal number. (iii) Add binary number $(1011)_2$ and $(1111)_2$. (iv) State De Morgan's Law. (v) Define minterm and maxterm.	4
(e)	Explain Amplitude modulation. Derive the expression for the total power radiated by the modulated signal. Also calculate modulation efficiency.	5

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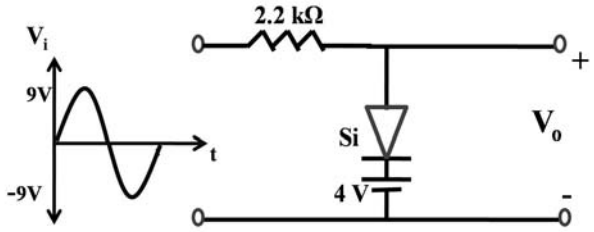
SECTION C

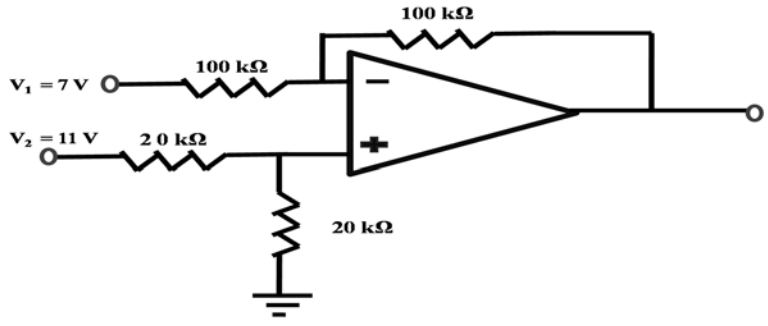
3. Attempt any *one* part of the following: 10*1 = 10

Qno	Questions	CO
(a)	In the bridge rectifier circuit, the secondary voltage Vs= 100 sin50t and load resistance is 1kΩ. Calculate:(i) DC current(ii) RMS value of current (iii) Efficiency (iv) Ripple factor.	1
(b)	Determine and draw output voltage for given network. 	1

4. Attempt any *one* part of the following: 10 *1 = 10

Qno	Questions	CO
(a)	Explain the working of enhancement type MOSFET along with their transfer characteristics.	2
(b)	Describe the construction and working of P-Channel Depletion MOSFET, with characteristic graph. Also Justify that it is a voltage controlled device.	2

5. Attempt any *one* part of the following: 10*1 = 10

Qno	Questions	CO
(a)	Briefly explain: (i) OP-Amp as Non-Inverting Amplifier. (ii) Inverting summer. (iii) Blue Tooth and Wi-Fi Technology.	3
(b)	Enlist the characteristics of ideal OP-Amp. Also determine the output voltage of following circuit. 	3

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6. Attempt any *one* part of the following: 10*1 = 10

Qno	Questions	CO
(a)	Define universal logic Gates. Realize basic logic gates using NAND and NOR gates.	4
(b)	Simplify the function F(A, B,C,D) =Σm(0,2,5,6,7,13,14,15) + d(8,10) using K-map and implement the simplified function using NAND gates only.	4

7. Attempt any *one* part of the following: 10*1 = 10

Qno	Questions	CO
(a)	Why do we need modulation? The antenna current of an AM transmitter is 8 A when only the carrier is sent, but it increases to 8.93 A, when the carrier is modulated by a single sine wave. Find percentage modulation. Determine the antenna current when the percent of modulation changes to 0.8.	5
(b)	An Audio frequency signa10 Sin $6\pi \times 400t$ is used to amplitude modulate a carrier of 25 sin $4\pi \times 10^5 t$. Calculate (i) Modulation Index (ii) Amplitude of each side band (iii) Total power delivered to the load of 2KΩ (iv) Bandwidth (v) Transmission efficiency	5