Name: Student University Roll No.:	Printed Pages:2

School of Engineering

Second Sessional Examination, Even Semester (AS: 2022-23)

B. Tech: CS-10, CS-19, AI-1(CSE), AI-2(CSE), AI-3(CSE), CCML-1(CSE), IOTBC-1(CSE)

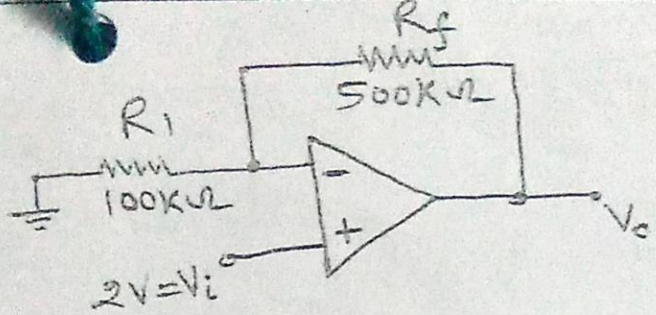
Year: 1st **Semester: 2nd**

Course Title: Basic Electronics Engineering **Course Code: BEC3201**	**Max Marks: 60** **Time: 3*hrs***

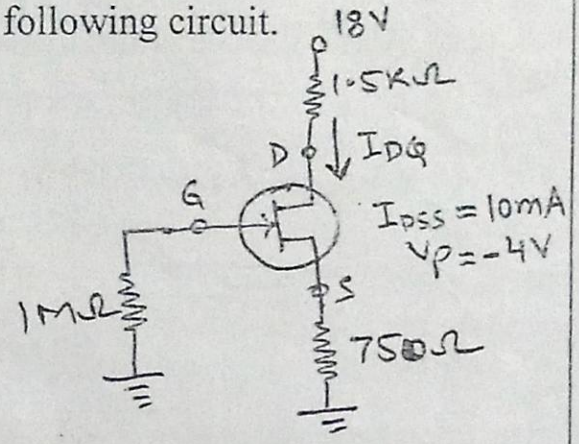
Instructions: Read the question Carefully.

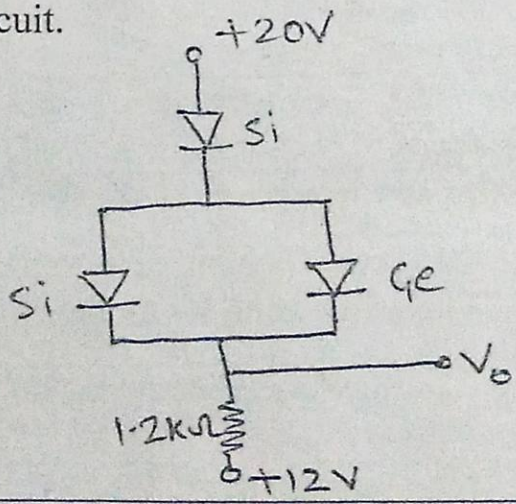
	SECTION 'A' **Q.N.1. Attempt all parts of the following:**	Course Objective	Marks
a)	What is the PIV of the diode used in Half wave rectifier?	**CO1**	**1**
b)	Draw the characteristics of ideal diode.	**CO1**	**1**
c)	What do you mean by I_{CBO}?	**CO1**	**1**
d)	Why gate current is always zero in MOSFET?	**CO2**	**1**
e)	Implement X-OR gate with basic gate?	**CO3**	**1**
f)	Define amplitude modulation	**CO3**	**1**
g)	What do you mean by CMRR?	**CO2**	**1**
h)	Draw the circuit diagram of differentiator and Integrator.	**CO2**	**1**

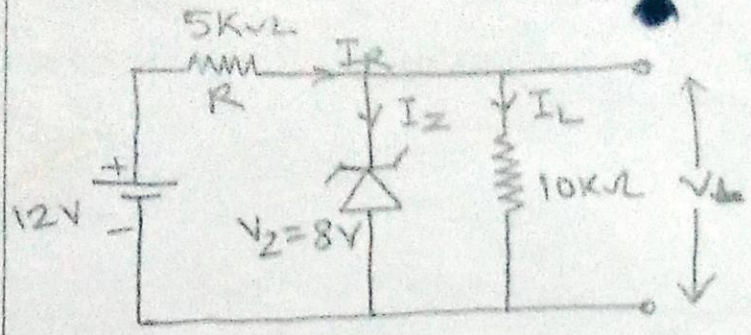
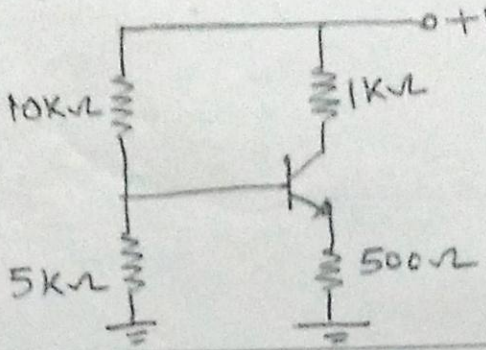
	SECTION 'B' **Q.N.2. Attempt any two parts of the following:**	Course Objective	Marks
a)	Explain working of full wave Bridge rectifier with input and output waveforms. In a centre tap full wave rectifier the rms half secondary voltage is 9 V. Assume load resistor (R_L) of 1 KΩ and diode forward resistor of 1Ω. Calculate I_{dc}, I_{rms}, ripple factor, P_{dc}, P_{ac} and rectification efficiency.	**CO1**	**6**
b)	Perform the following conversion. **(i)** $(64.625)_{10} = (\ ?\ )_2$ **(ii)** $(47.32)_8 = (\ ?\ )_{10}$ **(iii)** $(EF8C.D06)_{16} = (\ ?\ )_2$ (iv) $(235.151)_8 = (\ ?\ )_{16}$	**CO3**	**6**
c)	Derive the expression for the output of difference amplifier using OP-Amp. Find the output voltage of the following circuit		**6**



CO2

d)	Explain the working of n-channel JFET. Also define JFET parameters. Determine I_{DSQ} and V_{DSQ} for the following circuit. 	CO2	6

SECTION 'C'	Course Objective	Marks
Q.N.3. Attempt any two parts of the following:		
a) Explain the working of pn junction diode in reverse bias condition. Determine V_o for the following circuit. 	CO1	5
b) What do you mean by breakdown? Explain Zener breakdown mechanism. For the following circuit find V_L, I_L, I_Z, and I_R.		5

		CO1	
c)	For the following voltage divider Circuit find I_{CQ} and V_{CEQ} Assume germanium transistor and $\beta = 100$. 	CO1	5
Q.N.4. Attempt any two parts of the following:			
a)	With neat sketch explain the working of PNP transistor. Also derive the relationship between α and β.	CO2	5
b)	Explain the input and output characteristics of a BJT in CB configuration.	CO2	5
c)	Explain the construction and drain characteristics of N channel D-MOSFET.	CO2	5
Q.N.5. Attempt any two parts of the following:			
a)	Explain the block diagram of Communication system. What is the need for modulation?	CO3	5
b)	Perform the following subtraction using 1's and 2's complement $(24)_{10}-(17)_{10}$	CO3	5
c)	What are the universal gates? Reduce the following function using k map and implement the reduced function with NAND gate	CO3	5

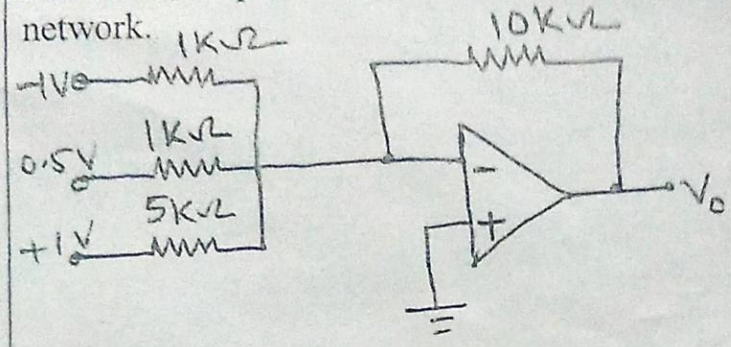
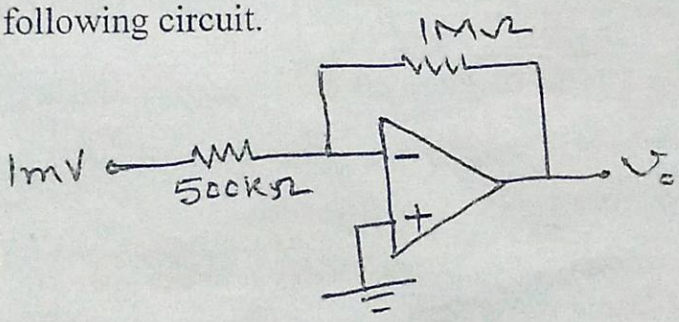
	F(A,B,C,D)=Σ(0,1,4,5,6,7,8,9,10,11,13,14)		
Q.N.6. Attempt any two parts of the following:			
a)	Derive the output expression for the inverting summing op amp. Find the output voltage for the following network. 	CO2	5
b)	Enlist the characteristics of ideal op-amp. Derive the expression of the output of the non-inverting op amp. Find the output V_0 of the following circuit. 	CO3	5
c)	Which type of feedback is used for the oscillation? Explain the principle of oscillator and describe the Bark Hausen Criterion.	CO3	5

Table 1: Mapping between COs and questions

(Number of COs may vary from course to course)

COs	Questions Numbers	Total Marks
CO1	Q1(a,b,c)Q2(a)Q3(a,b,c)	24
CO2	Q1(d,g,h)Q2(c,d)Q4(a,b,c)Q6(a)	35
CO3	Q1(e,f) Q2(b)Q5(a,b,c)Q6(b,c)	33