GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR
(GIET UNIVERSITY)

B. Tech (Fourth Semester - Regular) Examinations, April – 2025

23BEEPC24004 – Analog & Digital Circuits

(EE & EEE)

Time: 3 hrs Maximum: 60 Marks

Answer ALL questions

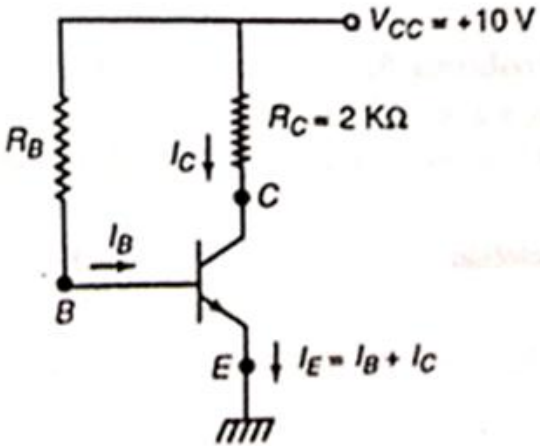
(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

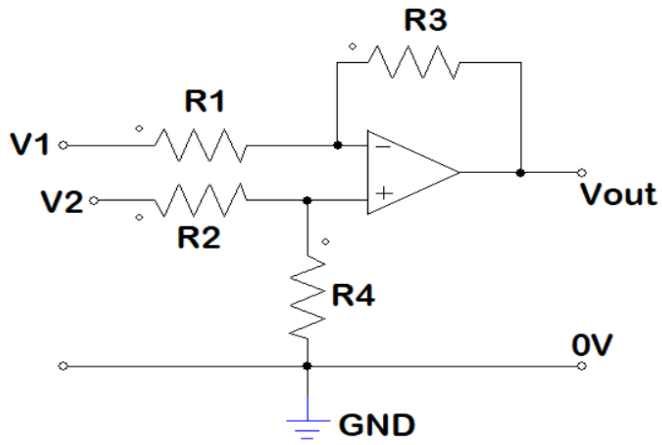
Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. Draw the VI characteristic of PN junction diode and zener diode.	CO1	K1
b. Explain about the common emitter configuration of bipolar junction transistor?	CO1	K2
c. What the significance is of don't care conditions in K-map simplification?	CO3	K2
d. Minimize the function f(ABC) = Σm(0,1,2,6) by using K-MAP.	CO3	K3
e. Draw the block diagram of OP-AMP.	CO2	K1

PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** the questions	Marks	CO #	Blooms Level
2. a. Design an analog alarm clock using K-MAP for the time of 8'o clock and 11'o clock.	5	CO3	K6
b. Minimize the function f(ABCD) = Σm(0,1,2,5,7,8,10,13,15) using K-MAP and draw the circuit using logic gates?	5	CO3	K3
(OR)			
c. What is the binary and octal value of $(1024)_{10}$?	5	CO3	K2
d. Create a 4:16 decoder by using 2:16 decoder.	5	CO3	K6
3.a. Explain briefly about the block diagram of operational amplifier?	5	CO2	K1
b. Explain about differential amplifier and draw the circuit?	5	CO2	K2
(OR)			
c. Design the circuit diagram of EXOR gate by using NAND gate and EXNOR gate by using NOR gate?	5	CO2	K6
d. Explain briefly about the shunt transistor voltage regulator.	5	CO2	K2
4.a. Explain the frequency response of OP-AMP?	5	CO2	K2
b. Design 4:1 multiplexer using logic gates and explain its operation.	5	CO3	K5
(OR)			
c. There is a series transistor voltage regulator with a load of 20KΩ with the output voltage of 5V having a zener of 5Volt and 10mA. That regulator is using a transistor with the β value 100 and the input voltage has provided of 12 voltage. Find the value of Resistance of Rs and the input current with the base current Ib inside the transistor?	5	CO2	K4
d. The transistor of the given circuit has β= 100. Determine the region of operation and the value of I_B, I_C , V_{CE} for R_B equal to 1) 500Ω and 2) 120Ω. Neglect the reverse saturation current.	5	CO2	K4



5.a.	A voltage series transistor regulator has a bc547 with the β = 200 and the load of 10KΩ. It has the zener diode of Vz=8 volt and Iz = 15mA, Find out the value of Rb in it with the input voltage of 12V and the output voltage across the load should be 8V. Find the value of input current Iin.	5	CO2	K2
b.	In a shunt transistor voltage regulator, the load of 20KΩ and the output voltage across the load is 5 volt is using a transistor with β value 100. A zener diode of 8 volt and the zener current of 10mA is used with the base terminal of the transistor. Find the value of the resistance Rs.	5	CO2	K2
	(OR)			
c.	Explain briefly about the differential type operational amplifier.	5	CO2	K2
d.	A differential opamp R3 = 5ohm and R1 = 10ohm with V1 = 10 volt and V2 = 8 volt, then find out the output voltage of the given circuit?			



		5	CO2	K4
6.a.	Explain about the derivator by using opamp and draw the neat sketch	5	CO2	K2
b.	Explain the difference in between synchronous and Asynchronous counter with an example.	5	CO2	K2
	(OR)			
c.	Draw the shift register and by using shift register design SISO, SIPO, PIPO and PISO.	5	CO5	K3
d.	Design a MOD-10 ring counter and explain this briefly.	5	CO5	K6

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