| PRN: | | Course Code : | ECE203R1 |
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Second Year **B. Tech** End Semester Examination Winter 2023

# Analog Circuit Design

Day and Date: Thursday, 30/11/2023 Max Marks: **100**

Time : 10.30am to 1.30 PM Duration: **03** hrs

Instructions: All questions are compulsory.

| | | | Marks | Bloom's Level | CLO |
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| Q.1 | | **Attempt the following** | | | |
| | a) | Design a single stage RC coupled amplifier circuit for Vcc=16v, $V_{CEQ}$=8v, $I_{CQ}$=3mA, hie=2kΩ, hfe=100, Rs=300Ω, $R_L$=470Ω $V_{CEmax}$=45v, $I_{Cmax}$=10mA, f=20Hz. | 08 | L4 | CLO3 |
| | b) | Explain two port network and derive h- parameters of transistor. | 08 | L4 | CLO3 |
| | | OR | | | |
| | b) | Derive expressions for h-parameters of CE configuration of transistor and draw h-parameter equivalent circuit. | 08 | L3 | CLO3 |
| Q.2 | | **Attempt the following** | | | |
| | a) | Explain any two advantages of negative feedback amplifiers. | 08 | L4 | CLO2 |
| | b) | Derive expression for Zif & Av of current series feedback amplifier | 08 | L4 | CLO2 |
| | | OR | | | |
| | b) | Explain the difference between all negative feedback amplifiers | 08 | L2 | CLO2 |
| Q.3 | | **Attempt any two from the following** | | | |
| | a) | Explain the construction and operation of JFET. | 08 | L2 | CLO1 |
| | b) | With neat circuit diagram explain the operation of E-MOSFET. | 08 | L2 | CLO1 |
| | c) | Give the difference between BJT and FET. | 08 | L2 | CLO1 |
| Q.4 | | **Attempt any two from the following** | | | |
| | a) | Explain the difference between fixed and adjustable voltage regulators using IC | 08 | L3 | CLO4 |
| | b) | Design a low voltage regulator circuit using IC 723 to provide an output voltage of 6 volts,if maximum load current is 80mA.Assume Vsense=0.7 volts. | 08 | L2 | CLO4 |
| | c) | Design an adjustable voltage regulator circuit to produce an output voltage of 7 volts when the input voltage is 12v, if the load current is 200mA. | 08 | L3 | CLO4 |
| Q.5 | | **Attempt any two of the following** | | | |
| | a) | Derive expression for frequency of oscillation of Wein bridge oscillator. | 09 | L1 | CLO2 |
| | b) | Explain construction and operation of Hartley oscillator. | 09 | L1 | CLO2 |
| | c) | A crystal has the following parameters: L=0.5H,C1=0.06pf, Cm=1pF, R=5kΩ. Find fs, fp, Qs and Qp. | 09 | L1 | CLO2 |
| Q.6 | | **Attempt any two of the following** | | | |
| | a) | What is timer? With neat block diagram, explain the operation of 555 Timer. | 09 | L2 | CLO4 |
| | b) | With neat circuit diagram and waveform diagram explain the operation of Astable Multivibrator. | 09 | L2 | CLO4 |
| | c) | With neat circuit diagram and waveform diagram explain the operation of One shot circuit. | 09 | L2 | CLO4 |

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