SE Sem 3 NEP Reg Winter 2025 - EXTC 19.12.2025

Time: 2 hours Marks: 60

N.B.:

1) Question No.1 is compulsory

2) Solve any three from remaining five.

3) Figures to right indicate full marks.

Q. 1 Attempt any five questions.

A) Explain construction & working of N channel EMOSFET. [3]

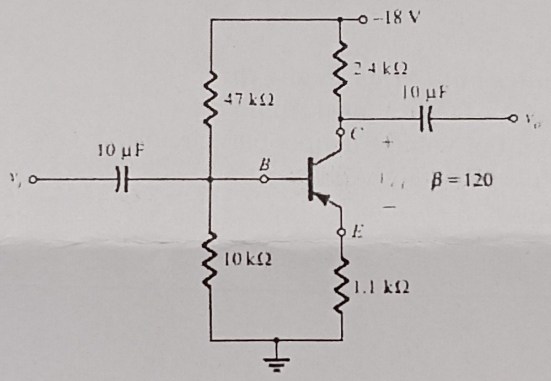
B) For a particular Op-Amp input offset current is 20 nA while input bias current is 60nA. Calculate the values of two input bias currents. [3]

C) Differentiate between AC & DC load line. [3]

D) Write short note on practical differentiator using operational amplifier [3]

E) Compare ideal & practical characteristics of operational amplifier. [3]

F) Determine V_{CE} for voltage divider bias circuit [3]



Q. 2 A) Design a high pass second order filter if cut off frequency 1KHz C=0.01μf & Pass band gain is 2. [10]

B) Draw & explain the working of Wein Bridge Oscillator using operational amplifier [5]

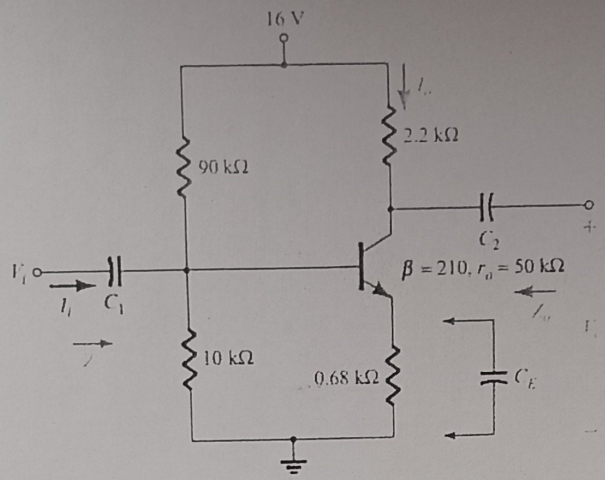
Q. 3 A) Design the Astable Multivibrator using IC555 for a frequency of 1kHz & duty cycle of 70%. Use C=0.1μF. [10]

B) Design a voltage regulator using IC723 to give Vo=15 v & output current of 500 mA. [5]

Q. 4 A) Design an adjustable voltage regulator using IC317 to give 15 volts at I_L=100mA, Given I_{ADJ}=100μA choose R1=240Ω. [10]

B) Compare inverting & non inverting Schmitt trigger. [5]

Q. 5 A) Find input impedance, output impedance & voltage gain of given circuit. [10]



B) Explain the effect of coupling & bypass capacitor on the frequency response. [5]

Q. 6 Write short notes on: (Attempt any three)

A) Block diagram of Operational Amplifier [5]
B) BJT CE amplifier voltage divider bias circuit [5]
C) IC 555 as Pulse Width Modulator [5]
D) Miller theorem [5]