

# CBCS SCHEME

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21EC34

## Third Semester B.E. Degree Examination, Jan./Feb. 2023 Analog Electronic Circuits

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. Explain the classical discrete circuit bias (voltage divider bias) method of BJT. (08 Marks)  
b. Explain the three biasing methods to bias MOS Amplifier circuits. (12 Marks)

OR

- 2 a. Explain the T equivalent circuit model of MOSFET. (08 Marks)  
b. Derive an expression for voltage gain of MOSFET with necessary waveforms. (06 Marks)  
c. Explain biasing a BJT using collector to base feedback resistor. (06 Marks)

### Module-2

- 3 a. Explain the common source amplifier and derive the expression for voltage gain. (10 Marks)  
b. A transistor amplifier is fed with a signal source having an open circuit voltage  $V_{sig}$  of 10mV and an internal resistance  $r_{sig}$  of 100K $\Omega$ . The voltage  $V_i$  at the amplifier input and the output voltage  $V_o$  are measured both without and with load resistance  $R_L = 10K\Omega$  connected to the amplifier output. The measured results are as follows :

	$V_i$ (mv)	$V_o$ (mv)
Without $R_L$	9	90
With $R_L$ connected	8	70

Find all the amplifier parameters. (10 Marks)

OR

- 4 a. With a neat diagram, explain the three frequency bands of MOSFET. (06 Marks)  
b. Explain the high frequency model of MOSFET. (06 Marks)  
c. Explain common source follower and derive the expression of voltage gain. (08 Marks)

### Module-3

- 5 a. Explain the properties of negative feedback. (10 Marks)  
b. Explain the transformer coupled class – A power amplifier and show that efficiency is 50%. (10 Marks)

OR

- 6 a. Explain the circuit operation of class – B power amplifier and also explain the transfer characteristics. (08 Marks)  
b. Explain the Four basic feedback topologies of the amplifier. (12 Marks)

### Module-4

- 7 a. Explain R and 2R resistor digital to analog (D/A) converter and also derive the expression of output voltage. (10 Marks)  
b. Explain the first order lowpass Butterworth filter with necessary voltage gain. (10 Marks)

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OR

- 8 a. Explain the operation of monostable multivibrator. (10 Marks)  
b. Explain the two types of Bandpass filters. (10 Marks)

Module-5

- 9 a. Explain the block diagram of power electronic system. (06 Marks)  
b. List and explain the applications of power electronics. (06 Marks)  
c. Explain the static anode – Cathode characteristics of SCR. (08 Marks)

OR

- 10 a. Explain the turn on methods of a Thyristor. (10 Marks)  
b. Explain the construction and working of UJT. (10 Marks)

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