CBCS SCHEME

USN | | | | | | | | | |

18EC42

Fourth Semester B.E. Degree Examination, Jan./Feb. 2023
Analog 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 working of classical discrete circuit Bias – voltage divider bias. **(10 Marks)**

b. Design a collector – to – base bias circuit for the specified conditions. Given : $V_{CC} = 15V$, $V_{CE} = 5V$, $I_C = 5mA$, $\beta = 100$. **(10 Marks)**

OR

2 a. Draw and explain the MOSFET biasing circuit using Fixed V_G. **(10 Marks)**

b. Derive the expression for g_m and A_V for the MOSFET amplifier circuit. **(10 Marks)**

Module-2

3 a. Write a note on three basic configuration of a MOSFET amplifier. Derive expression for characterizing parameters of MOSFET amplifier. **(10 Marks)**

b. Draw the high frequency equivalent circuit of a MOSFET and explain the significance of the different elements of the circuit. **(10 Marks)**

OR

4 a. Explain the working of RC – phase shift oscillator using FET. **(10 Marks)**

b. In Hartley oscillator $L_1 = 20\mu H$, $L_2 = 2mH$ and C variable. Find the range of C, if frequency is to be varied from 1 MHz to 2.5 MHz. Neglect the mutual inductance. **(10 Marks)**

Module-3

5 a. Draw the block diagram of current series feedback amplifier and derive an expression for input resistance, voltage gain, and output resistance. **(10 Marks)**

b. How power amplifiers are classified? Explain them briefly. **(10 Marks)**

OR

6 a. Explain the working of class B push pull amplifier with relevant waveforms. Show that maximum conversion efficiency is 78.5%. **(10 Marks)**

b. Explain series – shunt (voltage series) feedback amplifier. Determine input and output resistance of the amplifier. **(10 Marks)**

Module-4

7 a. Explain the working of inverting schmit trigger. Derive the equation for the trigger points. **(10 Marks)**

b. Derive an expression for the output of an inverting summing amplifier with 3 inputs and hence prove the circuit can act averaging amplifier. **(10 Marks)**

OR

8 a. Explain the working of instrumentation amplifier. Mention its applications. **(10 Marks)**

b. Explain the working of practical non-inverting amplifier. **(10 Marks)**

Module-5

9 a. Explain Successive – Approximation type – ADC with neat block diagram. **(10 Marks)**

b. Explain the working of precision full wave rectifier with relevant circuit and waveforms. **(10 Marks)**

OR

10 a. Explain the working of a monostable multifier with relevant circuit and wave forms. Mention few applications of this circuit. **(10 Marks)**

b. Design a second order low-pass Butterworth filter having high cut-off frequency of 1 KHz. Draw its frequency response. **(10 Marks)**

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