



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech IV Semester End Examinations (Regular/Supplementary) - July, 2021

Regulation: R18

ANOLOG AND PULSE CIRCUITS

Time: 3 Hours

(ECE)

Max Marks: 70

Answer FIVE Questions choosing ONE question from each module
(NOTE: Provision is given to answer TWO questions from any ONE module)

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

MODULE – I

1. (a) Draw the circuit diagram of a two stage RC- coupled CE transistor amplifier. Obtain the expression for overall voltage gain of an amplifier. [7M]
(b) An RC-coupled amplifier has a mid-frequency gain of 100. The gain is 80 at 50Hz and 100Hz. Calculate the half-power frequencies. [7M]
2. (a) What is Darlington amplifier? Explain in detail about the main characteristics of a Darlington amplifier? [7M]
(b) If the lower and the upper half power frequencies of an RC coupled amplifier are 30 Hz and 300 kHz, respectively. Find the voltage gain relative to the mid frequency gain at 60 Hz and 600 kHz. [7M]

MODULE – II

3. (a) Explain with the help of a block diagram the working principle of a feedback amplifier. Determine an expression for the voltage gain with feed back. [7M]
(b) Explain the effect of feedback on amplifier characteristics. [7M]
4. (a) Define feedback and explain the classification of feedback amplifiers. [7M]
(b) Determine the expressions for voltage gain (A_v), input impedance (R_{if}) and output impedance (R_{of}) for the voltage series feedback circuit. [7M]

MODULE – III

5. (a) What is the basic principle of oscillations? Is the external input signal necessary for the output of an oscillator? If not, how are oscillation initiated? [7M]
(b) Find an expression for the efficiency of a class B push-pull amplifier. [7M]
6. (a) Explain with the circuit diagram the action of a Wien-bridge oscillator. Find an expression for the frequency of oscillation. [7M]
(b) A certain Colpitts oscillator uses a tank circuit with $L = 20mH$, $C_1 = 200pF$ and $C_2 = 300pF$. What is the frequency of oscillation? [7M]

MODULE – IV

7. (a) Obtain the response for low pass RC circuit to the square input for different time constants. [7M]
(b) Draw the high pass RC circuit and explain how the high pass RC circuit acts as a differentiator. [7M]
8. (a) What is unidirectional and bidirectional sampling gate? What are the disadvantages of a two diode sampling gate? [7M]
(b) Explain the unidirectional sampling gate using transistor with a neat diagram. [7M]

MODULE – V

9. (a) Discuss the operation of a bistable multivibrator with the help of a diagram. [7M]
(b) For an un-symmetric astable multivibrator $R_1 = 100k\Omega$, $R_2 = 100k\Omega$, $C_1 = 0.02\mu F$ and $C_2 = 0.01\mu F$. Find the frequency of oscillation and the duty cycle. [7M]
10. (a) What is Schmitt trigger? Draw the circuit diagram of a Schmitt trigger and explain its action. [7M]
(b) Explain the operation of collector coupled monostable multivibrator with circuit diagram and also obtain gate width. Draw the wave forms at collector of both transistors. [7M]

– ○ ○ ○ ○ –