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Question Paper Code : 20471

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2022.

Fourth Semester

Electronics and Communication Engineering

EC 8452 – ELECTRONIC CIRCUITS – II

(Common to: Electronics and Telecommunication Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define sensitivity and de-sensitivity of gain in feedback amplifiers.
2. Write the expression for input and output resistance of voltage series feedback amplifier.
3. If $L_1=2$ mH, $L_2=4$ mH and $C=0.1$ nF, Observe the frequency of oscillation for Hartley oscillator.
4. In an RC phase shift oscillator, if $R_1 = R_2 = R_3 = 200k\Omega$ and $C_1 = C_2 = C_3 = 100$ pF. Detect the frequency of oscillations.
5. Illustrate the applications of tuned amplifiers.
6. Define unloaded and loaded Q of tank circuits.
7. Identify how the high pass RC circuit acts as a differentiator.
8. Compare Astable, Monostable and Bistable multivibrators.
9. Give the principle of operation of step-down DC-DC converter.
10. Compare Buck and Boost converter.

PART B — (5 × 13 = 65 marks)

11. (a) Draw the block diagram of Voltage series feedback amplifiers and derive the expressions of input impedance R_{if} , output impedance R_{of} and gain.

Or

- (b) Build the circuit diagram of current shunt feedback amplifier and develop the expressions for R_{if} and R_{of} .

12. (a) Demonstrate the working principle of RC phase shift oscillator circuit diagram also derive the expression for frequency of oscillation and condition for sustained oscillation.

Or

- (b) Estimate the frequency of oscillation and the condition for sustained oscillation of Colpitts oscillator with neat circuit diagram.

13. (a) Demonstrate a capacitance coupled single tuned amplifier circuit and derive the expressions for its important parameters.

Or

- (b) Conclude the following with neat circuit diagram:

- (i) Hazeltine neutralization
- (ii) Neutrodyne neutralization

14. (a) (i) Classify the various types of diode clippers (5)
(ii) Demonstrate the diode clippers with appropriate diagrams and waveforms. (8)

Or

- (b) Illustrate the operation of collector coupled Astable multivibrator with neat diagrams and waveforms. (13)

15. (a) Summarize the transfer characteristic, signal waveforms, power dissipation, power conversion efficiency of Class A amplifier.

Or

- (b) Illustrate the Buck converter with necessary diagrams and derive the expressions for voltage and current.

PART C — (1 × 15 = 15 marks)

16. (a) Explain the gain of Wein bridge oscillator using BJT amplifier with necessary equations and diagrams.

Or

- (b) In a Colpitts oscillator, the values of the inductors and capacitors in the tank circuit are $L = 40\text{mH}$, $C_1 = 100\text{pF}$ and $C_2 = 500\text{pF}$. Evaluating the following (15)

- (i) Frequency of oscillations.
- (ii) If the output voltage is 10v, find the feedback voltage.
- (iii) Find the minimum gains if the frequency is changed by changing L alone.
- (iv) Find the value of C1 for a gain of 10.
- (v) Also find the new frequency.