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**Question Paper Code : 86568**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Fourth Semester

Electronics and Communication Engineering

EC 1251 A – ELECTRONIC CIRCUITS – II

(Regulations 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the formula of ripple factor for full-wave rectifier with capacitor filter.
2. Compare full-wave and bridge rectifiers.
3. Why is quartz crystal commonly used in crystal oscillation?
4. State Barkhausen criterion for sustained oscillation.
5. The resonant frequency and Q factor of the single stage tuned amplifier are 300kHz and 15 respectively. If five single tuned amplifiers are connected in series, what is the effective bandwidth of the tuned amplifier?
6. Define the term efficiency of an amplifier.
7. Draw the circuit of a combinational clipper.
8. Design a differentiator circuit to differentiate an input signal that varies in frequency from 10Hz to about 1kHz.
9. What are the applications of blocking oscillators?
10. How can frequency is controlled using core saturation?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Derive the expressions for the rectification efficiency, ripple factor, transformer utilization factor, form factor and peak factor of bridge rectifier. (8)
- (ii) Explain the operation of zener diode voltage regulator. (8)

Or

- (b) (i) Describe how output voltage can be regulated with respect to line variations and load variations using SMPS. (8)
- (ii) Explain the principle of AC power control using SCR. (8)
12. (a) (i) Explain the working of Colpitt's oscillator and derive the equation for frequency of oscillation. (8)
- (ii) State why crystal oscillators are preferred for high frequency stability. Draw electrical equivalent circuit of crystal. (8)

Or

- (b) With neat circuit diagrams explain the principle of operation of the following two types of oscillators
- (i) Hartley oscillator (8)
- (ii) Armstrong oscillator. (8)
13. (a) What is the need for neutralization? Explain Hazeltine neutralization method. (16)

Or

- (b) With frequency response characteristics, explain single tuned and stagger tuned amplifiers. (16)
14. (a) With neat circuit diagram, explain the working of collector coupled Monostable multivibrator. Sketch the necessary base and collector waveforms. (16)

Or

- (b) Design a Schmitt trigger to have  $V_{cc} = 12V$ ,  $UTP = 5V$ ,  $LTP = 3V$  and  $I_c = 2mA$ . Using two silicon NPN transistors with  $h_{FE} = 100$  and  $I_2 = 0.1 I_{c2}$ . (16)

15. (a) With a neat diagram and suitable waveforms explain push-pull astable blocking oscillator with emitter timing. (16)

Or

- (b) Explain with a neat circuit diagram, the operation of a linear voltage time base generator. (16)
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