C20-EC–302

7240

BOARD DIPLOMA EXAMINATION, (C-20)

MAY—2023

DECE - THIRD SEMESTER EXAMINATION

ELECTRONIC CIRCUITS—I

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define the operating point of transistor amplifier.

2. List the advantages and disadvantages of collector-to-base bias circuit.

3. List any three applications of Darlington-pair amplifier.

4. State the concept of positive feedback in amplifiers.

5. State the effect of negative feedback on (a) gain and (b) bandwidth of amplifiers.

6. List any three performance metrics of power amplifier.

7. List different distortions in power amplifiers.

8. Write any three applications of Class C power amplifier.

9. State the conditions (Barkhausen's criteria) for an amplifier to work as an oscillator.

10. List the applications of oscillators.

PART—B

8×5=40

Instructions : (1) Answer **all** questions.

(2) Each question carries **eight** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. *(a)* Explain about the selection of proper operating point of transistor amplifier.

(OR)

(b) Explain the concept of thermal runaway and state the use of heat sink.

12. *(a)* Explain the working of two-stage RC coupled amplifier with circuit diagram.

(OR)

(b) Explain the operation of Darlington pair with the help of circuit diagram.

13. *(a)* Explain negative feedback amplifier with block diagram and derive the expression for the gain of negative feedback amplifier.

(OR)

(b) Draw the block diagrams of *(i)* voltage series, *(ii)* current series, *(iii)* current shunt and *(iv)* voltage shunt feedback amplifiers.

14. *(a)* Explain the working of Class-A power amplifier with circuit diagram and waveforms.

(OR)

(b) Explain the working of Class-AB push-pull power amplifier with circuit diagram.

15. *(a)* Explain the working of a Hartley oscillator with a circuit diagram and write the expression for its frequency of oscillations.

(OR)

(b) Explain the working of transistor crystal oscillator with a circuit diagram.

PART—C

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Instructions : (1) Answer the following question.

(2) The question carries **ten** marks.

(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

16. *(a)* Define stability factors and give their equations.

(b) Analyse the stability of fixed bias circuit with respect to I_{co} variations.

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