7221

BOARD DIPLOMA EXAMINATION, (C-20)

OCTOBER/NOVEMBER—2023
DBME – THIRD SEMESTER EXAMINATION

NETWORK ANALYSIS

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 series resonance.

2. Define quality factor of coil.

3. List two methods of network analysis based on Kirchhoff's laws.

4. State Norton's theorem.

5. Define critical coupling.

6. Define symmetrical and asymmetrical networks.

7. Draw attenuation characteristics for BPF and BSF.

8. Classify equalizers.

9. Define phase velocity and group velocity.

10. Define reflection coefficient and SWR.

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)* Derive an expression for impedance of parallel circuit at anti-resonant frequency.

(OR)

(b) Explain anti-resonance using susceptance curves and explain how the anti-resonance circuit acts as a current magnifier/rejector circuit.

12. *(a)* Explain ideal voltage source and ideal current source with an example.

(OR)

(b) Explain the principle of duality and draw the dual of a given network.
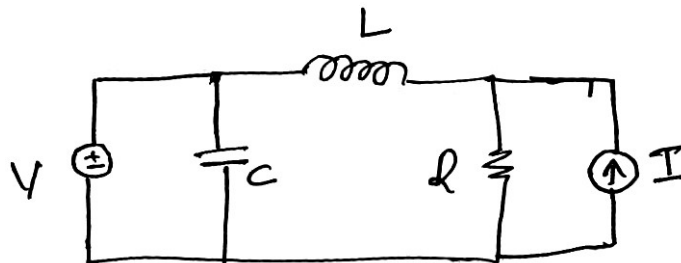
13. *(a)* State the dot rules for a coupled circuit and derive the expression for reflected impedance of a coupled circuit.

(OR)

(b) Explain the phenomenon of coupled impedance in single tuned circuits.

14. *(a)* Distinguish between attenuators with respect to filters.

(OR)

(b) Explain simple equalizer circuit.

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[*Contd...*

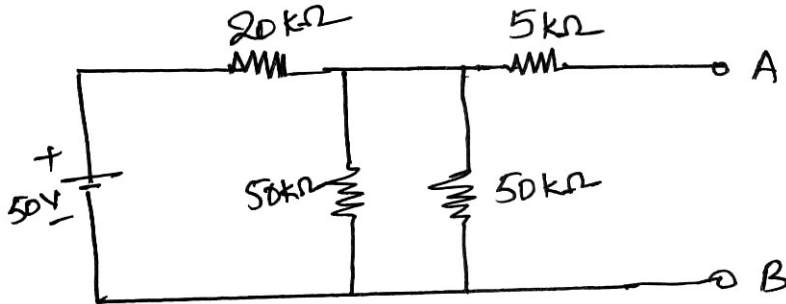**15.** *(a)* Derive an expression for Z_o and propagation constant of a transmission line.

(OR)

(b) Define the primary and secondary constants of transmission line and express transmission line as a symmetrical T network.

PART—C

$10 \times 1 = 10$

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. Can you design following circuit by using Thevenin's theorem. If yes or no, justify your answer.

★★★