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C09–EC–306

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BOARD DIPLOMA EXAMINATION, (C–09)

SEPTEMBER/OCTOBER - 2020

DECE—THIRD SEMESTER EXAMINATION

CIRCUIT THEORY

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 term 'resonance'.

2. Define RMS value and average value.

3. Define *Q*-factor of a capacitor circuit.

4. Define junction and loop.

5. Define transfer impedance.

6. Explain ideal voltage source.

7. Write the limitations of superposition theorem.

8. Write the principle of coupled circuits.

9. Write current, voltage equations for transient *R-C* circuit.

10. What is linear wave shaping?

PART—B

10×5=50

Instructions : (1) Answer *any* **five** questions.

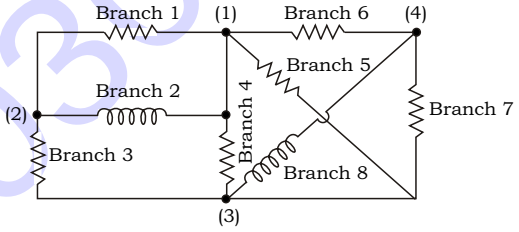
(2) Each question carries **ten** marks.

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

11. Draw *V-I* characteristics and calculate power of pure capacitor with AC source.

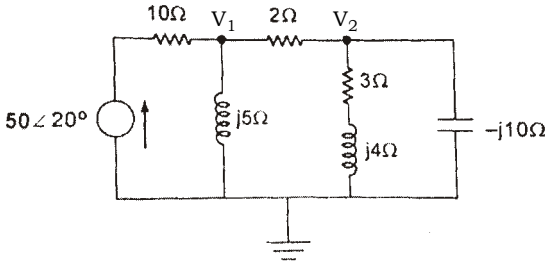
12. A coil having L 0 14 H and R 9 43 is connected across a 50 Hz, 230 V supply. Calculate X_L, Z, I, V_R and V_L.

13. *(a)* Determine the number of mesh current required to solve the given network shown below :



(b) Write the expressions to convert star to delta network.

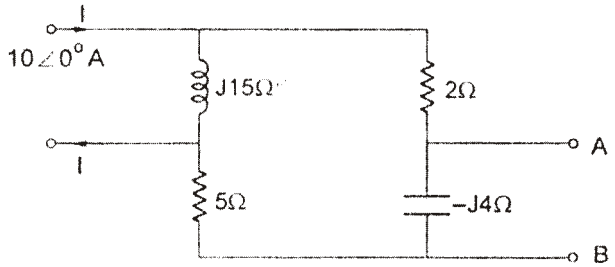
14. Find the current through $j5$ using nodal analysis :



15. *(a)* Write the statements of Norton's theorem and superposition theorem. 5

(b) Write the advantages of reciprocity theorem and maximum power transfer theorem. 5

16. Draw the Norton's equivalent circuit for the following network :



17. Two coupled coils with L_1 0 02 H, L_2 0 01 H and K 0 5 are connected in two different ways—series aiding, series opposing arrangement, then find equivalent inductance for series aiding and series opposing.

18. Explain how a low-pass *R*-*C* circuit works as an integrator.

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