BT-MRE-I-12.19-1475 Reg. No. | | | | | | | | |

B

B.Tech. Degree I Semester Examination in Marine Engineering December 2019

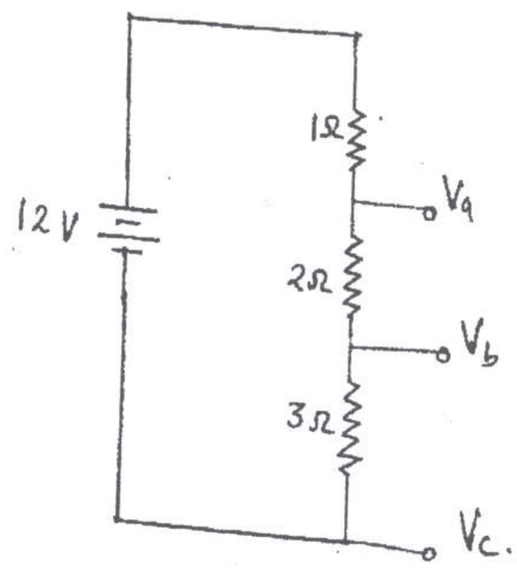
19-208-0105 BASIC ELECTRICAL ENGINEERING

(*2019 Scheme*)

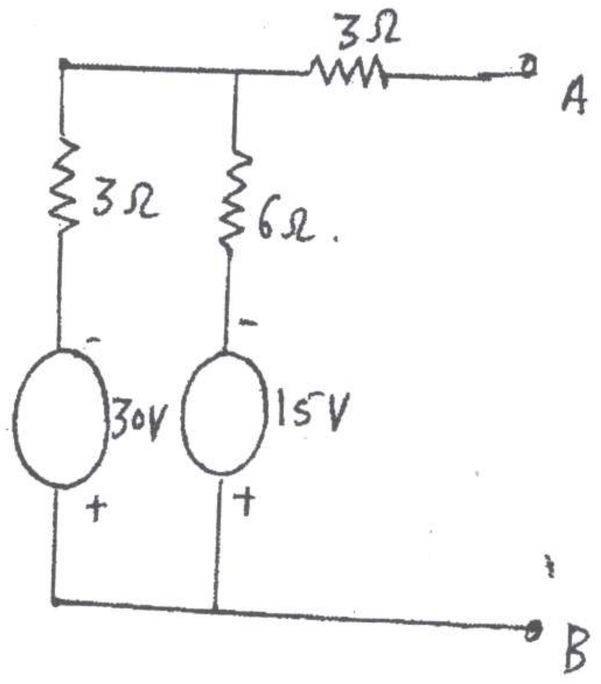
Time: 3 Hours Maximum Marks: 60

(5 × 15 = 75)

I. (a) Find all the possible voltage values that can be obtained from the given circuit: (5)



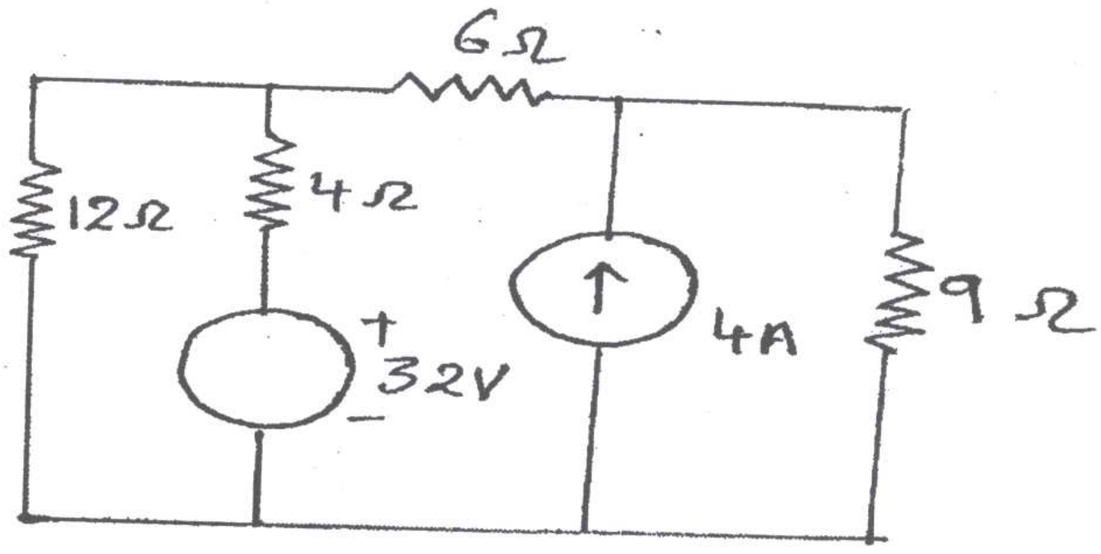
(b) Find Thevenin's and Norton's equivalent of the following circuit: (5)



(c) State Kirchoff's Laws (5)

OR

II. (a) Find Power in 9Ω by superposition theorem. (8)



(b) State and illustrate Max power transfer theorem. (7)

(P.T.O.)

III. (a) Derive expression for energy stored in a capacitor. (7)

(b) A ring composed of three sections. The cross-sectional area is $0.001m^2$ for each section. The mean arc length are l_a=0.3m, l_b = 0.2m, l_c = 0.1m. An air-gap length of 0.1mm is cut in the ring. μ_r for sections a, b, c are 5000, 1000 and 10000 respectively. Flux in the air gap is 75mwb. (8)

Find (i) mmf, (ii) exciting current if coil has 100 turns, (iii) reluctances of the sections.

OR

IV. (a) State Faraday's law of Electromagnetic induction and Lenz's law (7)

(b) Two coils have a mutual inductance of 0.3H. If the current in one coil is varied from 5A to 2A in 0.4s, calculate the average emf induced in the second coil, the change of flux linked with the second coil assuming that it is wound with 200 turns. (8)

V. (a) Explain resonance in series RLC circuit. (7)

(b) An R-L series circuit draws a current of 1 A when connected across a 10V, 50 Hz ac supply. Assuming the resistance to be 5Ω, find the inductance of the circuit. What is its power factor? (8)

OR

VI. (a) Define the following terms with respect to an AC quantity: (7)

(i) RMS value

(ii) Frequency

(iii) Form factor

(iv) Average value

(b) A series RLC circuit consists of R = 1000 Ω, L = 100 mH and C = 10 picofarads. Applied voltage to the circuit is 100V. (8)

Find: (i) Resonant frequency of circuit (ii) Quality factor of circuit at resonant frequency (iii) at what angular frequencies do half power points occur (iv) Bandwidth of circuit.

VII. (a) Compare Thermal and Hydro power stations. (7)

(b) A delta connected balanced 3 phase load when supplied from a 400V 50 Hz 3 phase supply, draw a line current of 20A and the power taken by load is 10000W. Find (i) impedance in each branch (ii) line current and power if same load connected in star. (8)

OR

VIII. (a) Derive the expression for three phase delta connected balanced load. (7)

(b) Three phase star-connected load when supplied from a 400V, 50Hz source takes a line current of 10A at 66.86 degree with respect to its line voltage. (8)

Calculate: (i) Impedance, (ii) pf and active power consumed.

Draw phasor diagram.

IX. (a) State the advantages of AC over DC transmission. (7)

(b) Explain Plate Earthing with neat labelled diagram. (8)

OR

X. (a) Explain briefly Ring main, radial and interconnected distribution system. (7)

(b) Write notes on: (i) Fuse and its types (ii) MCB (5)

(c) What are the points to be earthed in electrical distribution system. (3)

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