Seat No:-_____

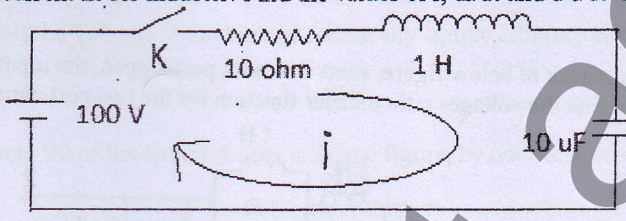
GANPAT UNIVERSITY
B.TECH SEM.3rd ELECTRICAL ENGINEERING
REGULAR EXAMINATION NOV-DEC 2014
2EE302: CIRCUIT ANALYSIS

TIME:-3 HOURS TOTAL MARKS-70

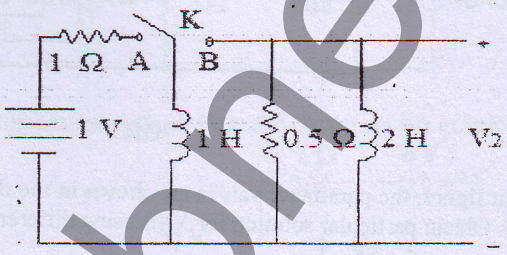
INSTRUCTION:-
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Section-I

Que-1 **(a)** In the network of below figure, the switch k is closed at t = 0 with the capacitor uncharged and with zero current in the inductor. Find the values of i, di/dt and d^2i/dt^2 at t = 0+. **(06)**

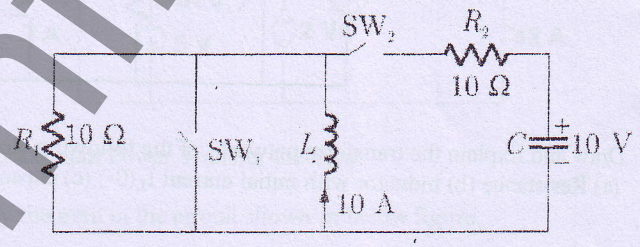


(b) In the network of below figure, the switch K is in position A for a long period of a time. At t = 0, the switch is moved from A to B. Obtain particular solution for V_2 (t) using differential equation method. **(06)**

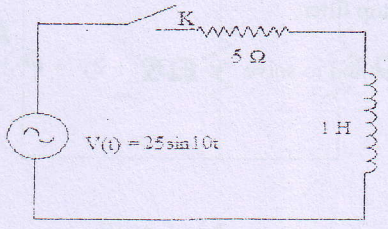


OR

Que-1 **(a)** In the circuit shown in figure, switch SW1 is initially closed and SW2 is open. The inductor L carries a current of 10 Amp and the capacitor charged to 10 V with polarities as indicated. SW2 is closed at t = 0 and SW1 is opened at t = 0. Determine current through C and the voltage across L at (t = 0+). **(06)**



(b) In the network of below figure, a sinusoidal voltage 25sin10t is applied at time t = 0 to series R-L ckt. Determine the current by Laplace transform method. **(06)**



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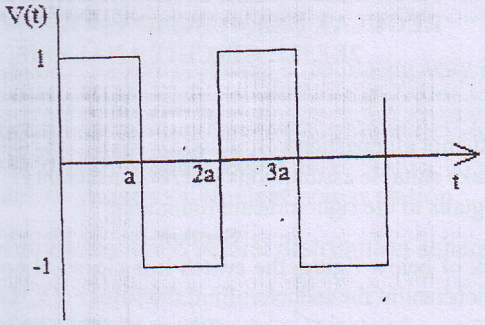
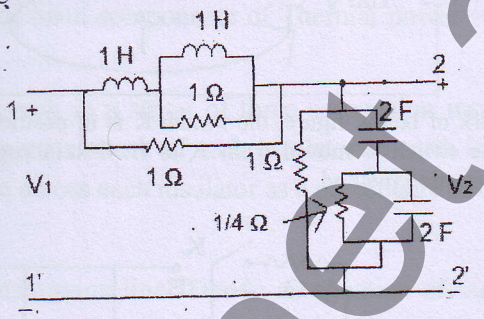
Que-2 **(a)** For the waveform shown in below figure, write its equation and determine its Laplace transform. **(06)**

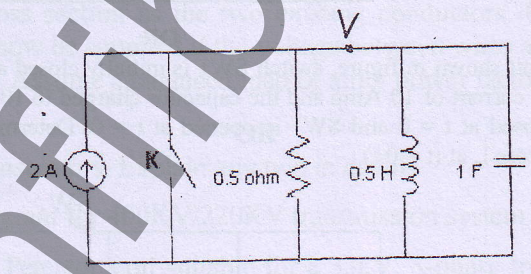


(b) For the network of below figure, show that with port 2 open, the input impedance at port 1 is 1Ω. Also find the voltage- ratio transfer function for the two port network. **(05)**



OR

Que-2 **(a)** In the given figure, the parameter values are shown in the diagram. The switch K is opened at time t=0. Obtain particular solution for V (t) using differential equation method. **(06)**



(b) Draw and Explain the transform networks of the following elements **(05)**
(a) Resistance (b) inductor with initial current $I_L(0-)$ (c) capacitor with initial voltage $V_C(0-)$

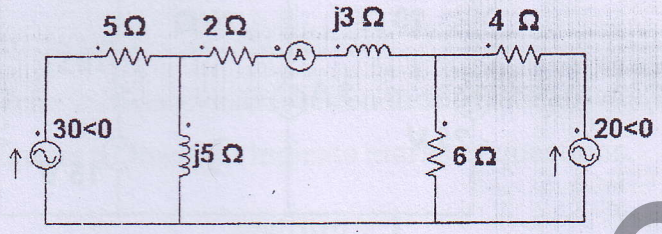
Que-3 **(a)** Discuss the advantages of Laplace transformation method over the classical methods **(03)**

(b) Explain: Band stop filter. **(04)**

(c) Use transform method to solve $y'' + 3y' + 2y = e^t, \quad y(0) = 1, y'(0) = 0.$ **(05)**

Section-II

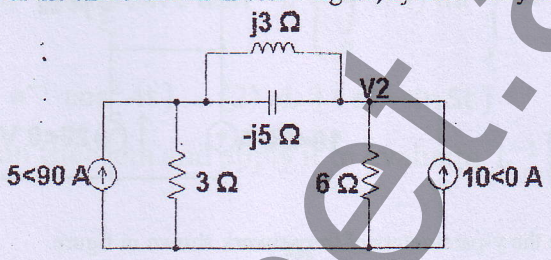
Que-4 **(a)** Using mesh analysis (KVL), determine current through ammeter in the circuit shown in below figure. **(07)**



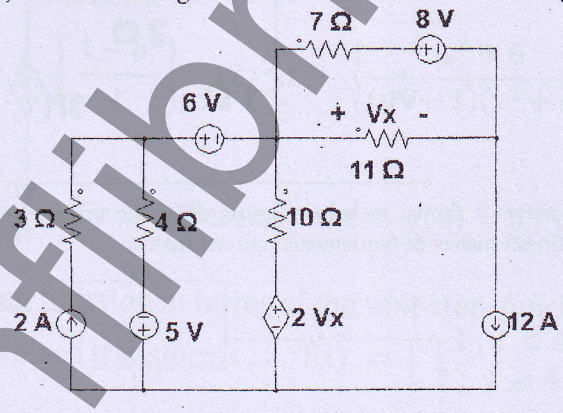
(b) State and prove the Tellegen's theorem by taking any simple arbitrary circuit. **(05)**

OR

Que-4 **(a)** Find the voltage V2 of the circuit shown in below figure, by node analysis (KCL). **(06)**

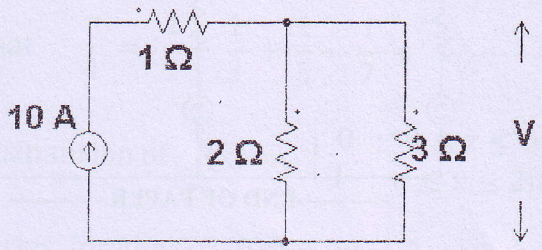


(b) Using node analysis, determine voltage *Vx* in the circuit shown in below figure. **(06)**



Que-5 **(a)** State and prove the Maximum Power Transfer theorem. **(06)**

(b) Verify the reciprocity theorem in the circuit shown in below figure. **(05)**



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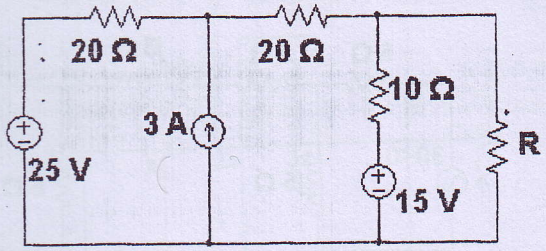
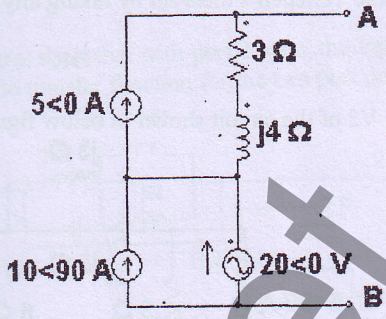
OR

Que-5 **(a)** Find 'R' for maximum power transfer, and also the maximum power which can be transferred, in the given circuit shown in below figure. **(05)**

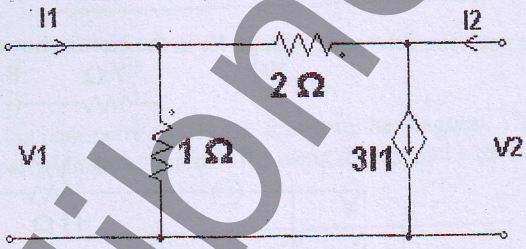


(b) Find the Norton's equivalent network across A-B in below figure. **(06)**

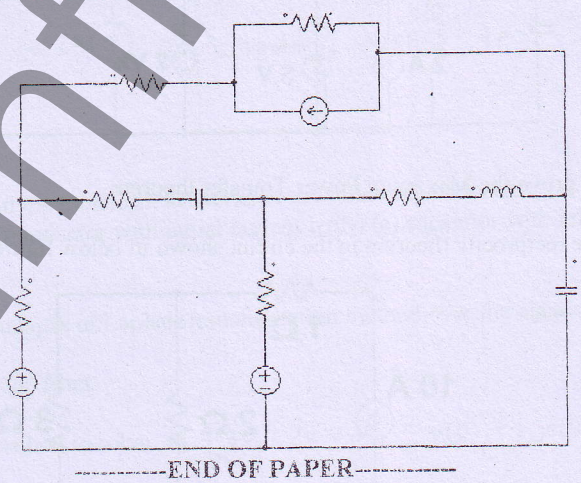


Que-6

(a) Determine the y-parameters of the network shown in figure. **(05)**



(b) For the network shown in below figure. draw the oriented graph and write the incidence matrix, tie-set matrix & fundamental cut-set matrix. . **(07)**



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