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B.E / B.Tech. (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2011
COMPUTER SCIENCE AND ENGINEERING BRANCH
FOURTH SEMESTER

EE 9262 ELECTRICAL ENGINEERING AND CONTROL SYSTEMS

(REGULATIONS 2008)

Time: 3 Hours

Max. Marks: 100

Answer ALL Questions

1. What do you mean by voltage dependent voltage source (VDVS) and current dependent voltage source (CDVS)?
2. State Norton's theorem. Draw its equivalent circuit.
3. Tabulate the differences between lap winding and wave winding.
4. Why single phase induction motor is not a self starting one?
5. What are the merits and demerits of closed loop control system?
6. What are the differences between positive feedback and negative feedback?
7. What do you mean by steady state response and transient response?
8. Define the terms resonant frequency and gain margin.
9. What are the advantages of state space approach?
10. Draw the state diagram for a Multiple Input Multiple Output system.

PART B

(5x 16=80)

11. (i) Obtain the state model of the given electrical network as shown in figure 1 in the standard form. (8)

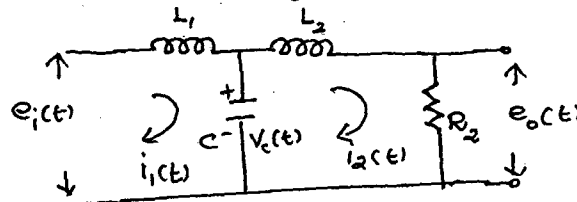


Figure 1

- (ii) Obtain the state model by direct decomposition of a system whose transfer function is given by, (8)

$$Y(S)/U(S) = 5s^2 + 6s + 8 / s^3 + 3s^2 + 7s + 9$$

12. (a) (i) Find the current through branch a-b using mesh analysis figure 2. (8)
(ii) A Series circuit consisting of 25Ω resistor, 64 mH inductor and 80μ F Capacitor is connected to a 110V, 50Hz single phase supply as shown in the figure 3.

(ii) Use Least-Square regression to fit a straight line to plot the data and the straight line.

X	0	1	2	3	(8)
Y	0	1.7183	6.3891	19.0855	

(OR)

12) b) i) Use Graphical Method to find the location of a real root of the equation

$$x^2 - 4x - 10 = 0 \quad (8)$$

ii) Use Newton-Raphson method to compute the positive root of the equation

$$x^3 - 8 - 4 = 0, \text{ correct to five significant digits.} \quad (8)$$

13) a)(i) Find the Lagrange Interpolation polynomial which agrees with the following data: (8)

X	1.0	2.0	3.0	4.0
ln (x)	0.0	0.6931	1.0986	1.3863

Use it to estimate at $x=0.5$

(ii) Estimate the value of $f(2.5)$ using Bessel's central difference formula for the following data: (8)

X	1.0	2.0	3.0	4.0
ln (x)	0.0	0.6931	1.0986	1.3863

(OR)

13) b) Draw the flowchart to evaluate forward difference and backward difference for a set of n Function values. Construct difference table and evaluate $f(0.6)$ for the following data (16)

x	0.1	0.3	0.5	0.7	0.9	1.1	1.3
F(x)	0.003	0.067	0.148	0.248	0.370	0.518	0.697

14) a) (i) Explain the concepts of simulation modeling and give its types. Name three or four of the Principal entities, attributes and activities to be considered if you were to simulate the Operation of a) Railway ticket Booking model b) Hotel management model (12)

(ii) Mention the principles used in modeling (4)

(OR)

14) b) i) Explain the logical flowchart of process of simulation. (8)

ii) Write short notes on types of simulation Models (8)

15) a) Design a simulation model for Telephone system based on the assumption that there are 8 lines and 3 links. (16)

(OR)

15) b) Design a simulation model for a manufacture shop model (16)