CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VI Semester Supplementary Examinations June-2025
Course Name: Computer Methods in Power Systems
(Electrical & Electronics Engineering)

Date: 24.06.2025 AN | Time: 3 hours | Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	Draw an oriented graph of a network. Indicate a tree and corresponding Co-tree.	2 M
2.	What is meant by primitive network?	2 M
3.	How is the swing bus selected in a load flow study?	2 M
4.	What is a Jacobian matrix?	2 M
5.	What are the applications of short circuit analysis?	2 M
6.	What is short circuit current of a power system?	2 M
7.	What are sequence network?	2 M
8.	What is the sequence network for an L-G fault on a power system?	2 M
9.	A system has two stability limits 80 MW and 120 MW which is the steady state stability limit?	2 M
10.	State equal area criterion.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	Explain the formulation of Z_{bus} by addition of branches.	10M

OR

11. B).	By a singular transformation of primitive admittance matrix Y, prove that bus admittance matrix $Y_{bus} = A^t[y]A$	10M

12. A).	Compare Gauss-seidal method and Newton-Raphson method.	10M

OR

12. B). The following data are given for a three bus power system. Bus 1 slack bus V specified = 1.02 pu, Bus 2 PV bus $|v|$ Specified = 1.02 pu. P_a = 3 pu, Bus 3 PQ bus P_L= 4 pu, Q_L = 2 pu. Line reactances in pu are given below, carry out one iteration of load flow solution by Gauss-Seidal method   10M

Bus Code	Impedance
1-2	j0.5
2-3	j0.5
3-1	j0.5

13. A).	Distinguish between symmetrical and unsymmetrical short circuits.	10M

OR

13. B).	Derive an expression for the total power in a three-phase system in terms of the sequence components of voltages and currents.	10M

(P.T.O..)

14. A). Derive an expression for the fault current for a line to ground fault.   10M

OR

14. B). An alternator of negligible resistance having 1 pu voltage behind transient reactance in subjected to different types of fault at its terminals. The pu values of the magnitude of faut current are i) three phase fault is 5 pu ii) LL fault is 2.89 pu iii) LG fault is 4.28 pu. Determine the pu value of the sequence reactances of the machines?   10M

15. A). Derive swing equation for a single machine connected to an infinite bus system.   10M

OR

15. B). Distinguish between steady state and transient stabilities.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VI Semester Supplementary Examinations June-2025
Course Name: Power Semiconductor Drives
(Electrical & Electronics Engineering)

Date: 26.06.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	What are the advantages of three phase drives over single phase drives?	2 M
2.	Show the relation between speed and torque of DC motor.	2 M
3.	Why plugging type braking operation is not preferred for DC drives?	2 M
4.	Under what condition regenerative braking may employ to DC series motor.	2 M
5.	Show the circuit for two quadrant chopper fed DC separately excited motor.	2 M
6.	Show the expression for speed-torque for two quadrant rectifier fed DC series motor.	2 M
7.	Why the static scherbius drive has a poor power factor?	2 M
8.	What are the limitations of cycloconverter method of speed control for Induction motor?	2 M
9.	Define VSI.	2 M
10.	List out the applications of VSI based Synchronous motor.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). How would you explain the operation of DC separately excited motor fed from three phase full controlled rectifier? And also draw and explain its speed torque characteristics for continuous mode of operation.   **10M**

OR

11. B). A 230 V, 960 rpm, 20 A separately excited DC motor has armature resistance and inductance of 1.2 Ω and 50 mH respectively. Motor is controlled by a single-phase half-controlled rectifier with source voltage of 230 V, 50 Hz. Solve the no load speed, speeds and developed torques on the boundary between continuous and discontinuous conductions for α=45° and 135°.   **10M**

12. A). Explain the operation of chopper fed DC series motor in motoring and regenerative braking operation.   **10M**

OR

12. B). Illustrate the block diagram of closed loop speed control of a dc motor.   **10M**

13. A). Develop the expressions for average motor current, RMS motor currents, torque and average motor voltage, for class A chopper fed D.C separately excited motor.   **10M**

OR

13. B). A 220 V, 24 A, 1000 rpm separately excited dc motor having an armature resistance of 2 Ω is controlled by a chopper. The chopping frequency is 500 Hz and the input voltage is 230 V. Determine the duty ratio for a motor torque of 1.2 times rated torque at 500 rpm.   **10M**

(P.T.O..)

14. A). Explain the advantages of variable frequency drives.   10M

                                    OR

14. B). How would you explain the operation of the induction motor drive using static rotor   10M
         resistance control?

15. A). Illustrate the operation of self-controlled synchronous motor drive by cycloconverter. 10M

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15. B). List the applications and advantages of load commutated CSI fed Synchronous motor   10M
         drive.

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