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6E7142**6E7142****B.Tech. VI-Sem. (Main/Back) Examination, April/May - 2026****Electrical and Electronics Engineering****6EX4-02 Power System - II****EE, EX****Time : 3 Hours****Maximum Marks : 70****Instructions to Candidates:**

Attempt all Ten questions from Part A, Five questions out of Seven questions from Part B and Three questions out of Five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A**(Answer should be given up to 25 words only)****All questions are compulsory.****(10×2=20)**

1. Define load flow analysis and Define slack bus, PV bus, and PQ bus.
2. Differentiate between Gauss-Seidel and Newton-Raphson methods.
3. What is swing equation? Draw power angle curve.
4. Explain the concept of state estimation.
5. Derive the expressions for real and reactive power at a bus.
6. What is spot pricing?
7. What is demand side management? What is electricity market?
8. Compare SVC and STATCOM.
9. What will happen if all buses are taken as PQ buses? Why is reactive power not controlled at PQ bus?
10. Why is equal area criterion not valid for multi-machine systems?

PART - B

(Analytical / Problem Solving Questions)

Attempt any Five questions.

(5×4=20)

1. Explain the formation of bus admittance matrix using inspection method.
2. A 2-Bus power system has the following data:

Bus 1 is slack bus: $V_1 = 1.05 \angle 0^\circ$

Bus 2 is a load bus with $P_2 = -0.5$ p.u and $Q_2 = -0.2$ p.u

Line admittance: $Y_{12} = -j10$

Using Gauss-Seidel method, determine the voltage at bus 2 after one iteration. Assume initial voltage $V_2^{(0)} = 1 \angle 0^\circ$.

3. Explain excitation system in synchronous generators. Describe the working of PMU and WAMS.
4. Differentiate between preventive control and emergency control.
5. Discuss power system security assessment.
6. Explain regulatory framework in power systems.
7. Explain different electricity market models in detail.

PART - C

(Descriptive / Analytical / Problem Solving / Design Questions)

Attempt any Three questions.

(3×10=30)

1. Solve the load flow problem of a two-bus system using Gauss-Seidel method.
2. Analyze system stability using equal area criterion.

3. Explain load frequency control of a single-area system with block diagram.
4. Discuss various methods of voltage control in power systems.
5. Describe SCADA system in detail with block diagram.