

BACHELOR OF TECHNOLOGY (C.B.C.S.) (2014 COURSE)
B.Tech.Sem - VIII ELECTRICAL :SUMMER- 2022
SUBJECT : COMPUTER APPLICATIONS IN POWER SYSTEMS

Day : Monday
Date : 20-06-2022

S-13349-2022

Time : 02:30 PM-05:30 PM
Max. Marks : 60

N.B.:

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Assume suitable data if necessary.
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- Q.1**
- a) Explicate with neat labeled diagram the hierarchy of transmission and distribution system. [05]
 - b) What is the need of digital computers? Explain two winding transformer and generator modeling in detail. [05]

OR

- a) For a 4 bus system with each bus interconnected have an impedance of $0.4 + j 0.8$ p.u. Formulate bus admittance matrix for a 4 bus system. [05]
 - b) What is the nature and scope of power system studies? [05]
- Q.2**
- a) Explicate with a neat diagram computer applications in solar energy system design. [05]
 - b) Explain monitoring and scheduling of computer applications in solar energy system. [05]

OR

- a) What is the difference between monitoring and maintenance for computer applications in : i) Wind energy system ii) Solar energy system. [05]
 - b) Explain centralized monitoring system for computer applications in mini-hydro power stations with block diagram. [05]
- Q.3**
- a) Derive power flow equations for fast decoupled method. Explain the algorithm steps for fast-decoupled method. [05]
 - b) What is the necessity of load flow studies? Explain the advantages and drawbacks of load flow evaluation methods. [05]

OR

- a) Explain Newton Raphson method for a 4-bus system to solve load flow problem. [05]
- b) Explain the algorithm for Gauss Seidel method. What is the role of acceleration factors in Gauss Seidel method? [05]

P.T.O.

Q.4 a) Derive inverter equations used for DC system to solve DC load flow problem. [05]
Assume suitable data.

b) Explain with example the steps to solve AC-DC load flow problem. [05]

OR

a) What are various faults occurring in power system? Explain how digital computers help to evaluate fault analysis in power system? [05]

b) Enlist the parameters required for fault analysis. Explain any two fault analysis steps in ETAP software. [05]

Q.5 a) Explain economic dispatch without limits using Newton Raphson method. [05]
What are the advantages of using Newton Raphson method?

b) Explicate with example the linear programming method for optimal power flow analysis. [05]

OR

a) Explain: **i)** Generation shift distribution factors **ii)** Loss coefficients using sensitivity factors. [05]

b) Explain the transmission loss formula as a function of generation and loads. [05]

Q.6 a) What is on-line security assessment? Explain the major components of on-line security assessment. [05]

b) Explain: **i)** Generation outage sensitivity factors **ii)** Line outage sensitivity factors. [05]

OR

a) Explain the preventive and corrective actions required for power system security analysis. [05]

b) What is the difference between static security assessment and transient security assessment? [05]

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