Hall Ticket Number :										

R14

Code: 4P6221

M.Tech. II Semester Supplementary Examinations Feb/Mar 2016

Operation & Control of Power System

(Common to E.P.E. & E.P.S.)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

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UNIT-I

1. a) What is need for Unit Commitment? 2M
   b) Explain the following solutions of economic dispatch problem.
   i) Gradient method ii) Newton's method 10M

OR

2. a) Explain what are the constraints to be considered in solving the UC problem 5M
   b) Explain with a flowchart the forward DP approach of dynamic programming solution of unit commitment 7M

UNIT-II

3. a) Formulate a short-term hydrothermal scheduling problem by gradient approach 7M
   b) Discuss briefly hydrothermal scheduling 5M

OR

4. a) Explain pumped storage hydro plants 4M
   b) Formulate a short-term hydrothermal scheduling problem by gradient approach 8M

UNIT-III

5. a) What is the difference between ACE in single area and two-area power system? 4M
   b) Explain the static and dynamic analysis LFC of two area system 8M

OR

6. a) What is the Need for frequency and voltage control? 4M
   b) Sketch and explain the block schematic of a controlled two-area system 8M

UNIT-IV

7. a) Briefly discuss about the Inter utility energy evaluation. 8M
   b) Write the short notes on Wheeling 4M

OR

8. a) Explain the Interchange of Power and Energy-Economic interchange between interconnected utilities 8M
   b) Write the short notes on Power pools 4M

UNIT-V

9. a) What do you mean by contingency analysis? 4M
   b) Draw the flowchart and explain the AC power flow security analysis of a power system 8M

OR

10. a) What is contingency analysis program? Explain it. 4M
    b) Write the short notes on Maximum likelihood Weighted least squares method 8M

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M.Tech. II Semester Supplementary Examinations Feb/Mar 2016

Flexible AC Transmission System

(Common to EPE & EPS)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

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UNIT-I

1. Discuss about the basic types of FACTS controllers with an example for each type. 12M

OR

2. a) Derive the complex power equations at sending end and receiving end with the assumption of voltage (V), load angle (δ/2) and line reactance(jX) 8M

   b) Discuss about the importance of controllable parameters. 4M

UNIT-II

3. a) Explain the basic concept of voltage sourced converter with the help of neat diagram. 6M

   b) Draw the transformer connections for 12 pulse operation and explain. 6M

OR

4. Explain the operation of three phase full wave Bridge converter with the help of all necessary diagrams. 12M

UNIT-III

5. Explain the following with reference to shunt compensation.

   a) End of line voltage support

   b) Transient stability 12M

OR

6. Explain about the following types of variable impedance type var generators.

   a) Thyristor switched capacitor.

   b) TSC-TCR. 12M

UNIT-IV

7. a) Write about main elements of overall compensator control system. 6M

   b) Explain the transfer function and dynamic performance of SVC. 6M

OR

8. a) Explain the control schemes for transient stability and regulation slap in SVC and STATCOM. 12M

UNIT-V

9. Explain basic operating control schemes of GCSC, TCSC and TSSC 12M

OR

10. Explain the following objectives of series compensation.

    (a) Voltage stability.

    (b) Transient stability improvement

    (c) Sub synchronous oscillation damping. 12M

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Code: 4P6223

M.Tech. II Semester Supplementary Examinations Feb/Mar 2016

Advanced Power System Protection

(Common to EPE & EPS)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

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UNIT-I

1. a) Prove that duality is exists between Amplitude and Phase Comparator
   b) Write the merits and demerits of static relays.

OR

2. a) Compare the Circulating Current and Opposed voltage type Rectifier Bridge Comparator
   b) Explain the Circulating Current type Rectifier Bridge Comparator

UNIT-II

3. a) Explain initial and improved versions of Instantaneous static over current relay
   b) Explain static inverse time over current relay

OR

4 .a) Explain techniques to measure the period of coincidence
   b) Explain vector product type phase comparators.

UNIT-III

5. a) Explain realization of reactance and MHO relay using a sampling comparator
   b) Explain about Duo bias transformer differential protection

OR

6. a) Explain angle impedance relay with sampling comparator
   b) Explain reactance relay with sampling comparator

UNIT-IV

7. a) Explain in brief about conic section characteristics
   b) Explain in detail about poly phase distance schemes

OR

8. a) Describe the effect of line length and source impedance on distance relays
   b) Explain the power Swings for reactance relay in detail.

UNIT-V

9. a) Explain the Block diagram and flow chart approach of over current relays
   b) Explain microprocessor based impedance relays

OR

10. a) Explain about measurement of resistance and reactance's in relays
    b) Explain digital computer relaying using microprocessors

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Hall Ticket Number :										

R14

Code: 4P7221

M.Tech. II Semester Supplementary Examinations Feb/Mar 2016

Energy Conversion Systems

(Electrical Power Systems)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

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UNIT-I

1. a) List the test specifications for photovoltaic systems. 4M

   b) Discuss the applications of super conducting materials in electrical equipment and systems. 8M

OR

2. Explain the effect of solar radiation incidation on the junction. 12M

UNIT-II

3. a) Explain the principle of MHD power generation. 8M

   b) Explain the properties of Air and Wind. 4M

OR

4. An MHD duct has the dimensions w=0.6m, h=0.35m and l=1.7m (volume 0.357m^3). The magnetic field strength is B=4.2T along h and the gas velocity is μ=600m/s along l at a performance coefficient of k=0.65. Calculate
   (i) generated voltage and its gradient inside the duct.
   (ii) Load voltage and its gradient E caused by it inside the duct if it has a conductivity σ=60mho/m
   (iii) Current density and current in the system.
   (iv) Short circuit current density and current generated.
   (v) Power density.
   (vi) Total power generated 12M

UNIT-III

5. a) Brief the modes of operations of tidal project. 4M

   b) Characteristics of turbines for tidal power stations. 8M

OR

6. Explain the properties of waves and power content. 12M

UNIT-IV

7. a) Explain the principle of combined cycle cogeneration with a neat sketch. 6M

   b) Explain the principles following biomass conversion processes.
   (i) Bio-chemical conversion. (ii) Thermal conversion (or) pyrolysis. 6M

OR

8. a) Explain the principle of Thomson effect of thermo-electric energy conversion and derive the Thomson co-efficient. 6M

   b) Explain the Lurgi process of coal gasification with block diagram. 6M

UNIT-V

9. a) List the applications of fuel cells and draw the block diagram of practical fuel cell power generation scheme and explain. 6M

   b) Discuss the applications of Batteries for large powers. 6M

OR

10. a) Write short notes on pollution-free energy systems. 4M

    b) Explain the principles of EMF generation. 8M

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Hall Ticket Number :											**R14**

Code: 4P6228

M.Tech. I Semester Supplementary Examinations Feb/Mar 2016

Electrical Power Distribution and Automation

(Common to EPE & EPS)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

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UNIT-I

1. a) Derive the relationship between load and loss factors for three different cases when i) off peak load is zero ii) load is steady iii) for very short lasting peak 6M
   b) Define i) Diversity factor ii) coincidence factor iii) Contribution factor 6M

OR

2. a) Explain the classification of distribution systems 6M
   b) Explain about different load models and their characteristics 6M

UNIT-II

3. a) Derive the voltage drop equation for feeder with non-uniform distributed load 6M
   b) A 3-phase distribution line has resistance and reactance per phase of 15 ohms and 20 ohms respectively. If the sending end voltage is 33 kV and the regulation of the line is not to exceed 10%. Find the maximum power in kW which can be transmitted over the line. Find also the kVAR supplied by the line when delivering the maximum power 6M

OR

4. a) Obtain the condition for load power factor at which voltage drop is maximum? 6M
   b) A 3-phase 4.16 kV Y-grounded 500 kM long feeder main has a K- constant of 0.0001 VD_{pu}/ (kVA-kM). Determine the %voltage drop if the load is
   i) 500 kVA uniformly distributed load ii) 250 kVA increasing load 6M

UNIT-III

5. Explain about communication systems used in distribution automation 12M

OR

6. What is SCADA? Give the components of SCADA and also explain the system architecture? 12M

UNIT-IV

7. a) Explain about outage management in DMS 6M
   b) Explain the decision support applications of DMS? 6M

OR

8. a) Explain about database structures and interfaces of DMS 6M
   b) Explain about real time control of DMS 6M

UNIT-V

9. a) Explain about reconfiguration of distribution systems? 6M
   b) Define i) THD ii) under voltage iii) non-linear load 6M

OR

10. a) Explain about fault detection function of DA 6M
    b) List out types of disturbances occur in distribution systems? 6M

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