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M.TECH

EEPC102/ PEPC102/ /PSPC102

1st Semester Regular/Back Examination – 2014

POWER APPARATUS & SYSTEMS

BRANCH(S): POWER SYSTEMS,POWER SYSTEM ENGINEERING,ELECTRICAL POWER SYSTEM, POWER ELECTRONICS & DRIVES,POWER ELECTRONICS, POWER ENGINEERING AND ENERGY SYSTEMS

Time: 3 Hours

Max marks: 70

Answer Question No.1 which is compulsory and any five from the rest.

The figures in the right hand margin indicate marks.

Q1 Answer the following questions: (2x10)

a) Define SCR of an alternator ?
b) Explain the invariance of power as applied to electrical machine ?
c) Draw the basic diagram for kron' s primitive machine with two pole representation ?
d) What is constant flux linkage theorem ?
e) What do you understand by single phasing of 3 phase induction motor ?
f) What are the characteristics for a good excitation system ?
g) How a transformer is protected against an incipient fault ?
h) Explain the procedure for fault calculation of an induction motor ?
i) Explain basic function of Power system stabilizer ?
j) Rank various faults in order of severity for a fault at given location ?

Q2 a) What do you understand by linear transformation ? Also explain the role of transformation matrix ? (5)

b) Explain various reference frames such as Primary and Secondary reference frames ? (5)

Q3 Deduce Park's transformation relating to 3 phase currents of a Synchronous machine to its corresponding d-q axis currents ? Also explain the physical concept of park 's Transformation ? (10)

Q4 a) Differentiate between symmetrical faults and unsymmetrical Faults? Explain the transient behavior of synchronous alternator affected by both types of faults ? (5)

b) Draw the electrical analogous circuit explain the function of a hydraulic turbine ? (5)

Q5 a) Draw the block diagram of a brushless excitation with rotating Rectifier system ? (5)

b) Why stabilization circuit is necessary for an excitation control system ? Also draw a stabilizing circuit explaining its function ? (5)

Q6 a) What are the different OC and SC time constants defined in case of a synchronous generator for transient and sub transient condition ? Explain each of them ? (5)

b) What do you understand by high voltage surge ? Describe the steps may be taken to safeguard the transformer against these surges ? (5)

Q7 a) What do you understand by insulation Coordination ? Briefly Explain by drawing a suitable curve ? (5)

b) What are the causes and effects of Ferro resonance ? How can be these prevented ? (5)

Q8 Write Short Notes (Any Two) (5x2)

a) Droop characteristic of a Governor
b) Short circuit Oscillograms Analysis.
c) General characteristic of inrush currents in a transformer.