Bachelor of Engineering
Eighth Semester Main Examination, June-2021
Computer Aided Electrical Machine Design [EX-801]
Branch-EX

__Time: 3:00 Hrs__   __Max Marks 70__

Note: 1. Attempt any five questions.
           2. All question carry equal marks.
           3. Answer should be precise & to be point only.
           4. Assume suitable data if necessary & state them clearly.

Q.1   (a) Why computer aided design of rotating machines are complicated? Draw the flow chart for the computer aided design of rotating machines.
         (b) What are the various approaches in computer aided design? Explain with flow chart.

Q.2   (a) Explain specific electrical loading and specific magnetic loading.
         (b) Write advantage and disadvantage of choosing high value of   specific electrical loading and specific magnetic loading.

Q.3   (a) Derive the output equation of DC machine in terms of design constants.
         (b) How the armature winding of DC machine is design?

Q.4   (a) Determine suitable values for-
         (i) External diameter of armature
         (ii) Core length
         (iii) Number of poles, for a 1000 KW, 500 Volts and 350 r.p.m D.C. generators.
         Assume suitable values for electric and magnetic loading. Justify the values of diameter and length of armature from the limiting value of peripheral speed and voltage between the adjacent commuter segments respectively.
         (b) Derive the output equation of a 3 phase transformer in terms of design constants.

Q.5   (a) Explain why power transformer is design to have maximum efficiency at or near full load
         (b) Deduce an expression between volts per turn and K.V.A rating of a   transformer.

Q.6   (a) Calculate the core and window area required for a 1000 KVA, 6600/400 volts 50 HZ, 3 phase core type power transformer. Assume a flux density in the core of 1.38   tesla. A current density of 2.35 A/mm^2 and window space factor of 0.32.
         (b) Derive the output equation of a 3 phase induction motor is terms of design constants.

Q.7   (a) Explain the factor affecting the 3 phase transformer is terms of design   constants .
         (b) Explain crawling and cogging phenomena.

Q.8   (a) Calculate the main dimensions for a 250 KVA, 6600/400 volts 50 HZ 3 phase delta/star core type oil immersed self-cooled outdoor type power transformer. Assume suitable values for various design constants and specific magnetic loading.

         (b) Derive the output equation of a 3 phase synchronous machine in terms of design constants.

(c) Calculate the following design information's for a 30 KW , 440 KW, 3-phase, 6 pole, 50 Hz delta connected ,sq. cage induction motor,

a) (i)   Main dimensions of stator frame.
(ii) Number of turns per phase in stator winding.
(iii) Number of stator slots.
(iv) Number of conductors per slot.

b) Assume suitable values for the missing data

(d) Calculate the stator core dimensions for a 10 MVA, 11 KV, 50 Hz, 3 phase, 2 pole turbo alternator , based on the following information:

(i)   Specific magnetic loading B_{av}=0.63 Tesla
(ii) Specific electric loading,   q=48000 amp.cond/m
(iii) Limiting peripheral speed   v=120 m/sec.
(iv) Length of air gap l_g=2.0 cm,   Stator winding factor kw=0.955

Bachelor of Engineering
Eighth Semester Main Examination, June-2021
Computer Application to Power System [EX-802]
Branch-EX

Time: 3:00 Hrs   **Max Marks 70**

Note: **i) Attempt any five questions out of eight.**
ii) All question carry equal marks.
iii) Answer should be precise & to be point only.
iv) Assume suitable data if necessary & state them clearly.

Q.1   (a) Explain the power system components in detail.
(b) Describe the formulation of z-bus.

Q.2   (a) Explain the regulating transformer with the help of suitable diagram.
(b) Explain effect on load ability of transmission lines.

Q.3   (a) What is compensation? Explain series and shunt compensation.
(b) Explain the P-V curve for voltage stability assessment.

Q.4   (a) Explain the power system security and classify the security analysis system.
(b) Explain security level and also give the classification of security level.

Q.5   (a) Explain security function and security control.
(b) Define pre-contingency, post contingency, corrective-rescheduling.

Q.6   (a) Explain "Pie-model' of transmission line.
(b) Explain capability curve of an alternator.

Q.7   (a) Explain participation factor for stability analysis.
(b) Explain generation shift distribution factors.

Q.8   (a) Explain line outage distribution factors.

(b) Explain SVC in detail with its characteristics.
(c) Explain relation between load bus and PV bus.
(d) Explain surge impedance.

Bachelor of Engineering
Eighth Semester Main Examination, June-2021
FACTS [EX-8103]
Branch-EX

Time: 3:00 Hrs   **Max Marks 70**

Note: **i) Attempt any five questions out of eight.**
      ii) All question carry equal marks.
      iii) Answer should be precise & to be point only.
      iv) Assume suitable data if necessary & state them clearly.

Q.1   (a) Explain facts devices with block diagram.
        (b) Explain application of facts controllers in distribution systems.

Q.2   (a) What is compensation? Explain reactive power compensation.
        (b) Explain design of SVC voltage regulator.

Q.3   (a) Explain modeling of SVC for power flow and stability studies.
        (b) Explain transient stability and steady state stability.

Q.4   (a) Explain prevention of voltage instability.
        (b) Explain principle of operation of STATCOM.

Q.5   (a) Explain in detail TCSC with its operation.
        (b) Explain static phase shifting transformer.

Q.6   (a) Explain SSR mitigation technique.
        (b) Explain modeling of TCSC for load flow studies and stability studies.

Q.7   (a) Explain UPFC and its controlling techniques.
        (b) Explain application of SSSC and its characteristics.

Q.8   (a) Write benefits with the application FACTS controllers.
        (b) Explain modeling of STATCOM for power flow studies.
        (c) Explain modeling of SSSC for power flow studies.
        (d) Explain operation of Interline power flow controllers.

Bachelor of Engineering
Eighth Semester Main Examination, June-2021
Power System Economics [EX-8201]
Branch-EX

Time: 3:00 Hrs   **Max Marks 70**

Note: **i) Attempt any five questions out of eight.**
      ii) All questions carry equal marks.

iii) Answer should be precise & to be point only.
iv) Assume suitable data if necessary & state them clearly.

Q.1   (a) What do you understand by regulation and deregulation?
(b) What are the conditions for deregulation & explain the conditions associated with deregulation?

Q.2   (a) Explain risk management and congestion management.
(b) What do you understand by competitions in power market? Discuss the efficiency of perfect competition.

Q.3   (a) What is the role of marginal cost in power market? What are its results?
(b) Explain the three stages of market power.

Q.4   (a) Define market power and power quality outcomes.
(b) Explain market power on demand side.

Q.5   (a) Explain structure of OASIS.
(b) Explain transfer capability of OASIS.

Q.6   (a) Explain fundamental restructure system.
(b) Explain transmission pricing.

Q.7   (a) Explain design for competitive prices.
(b) Explain designing to reduce market power.

Q.8   (a) Explain testing of market design.
(b) Explain screening curve.
(c) Explain working with marginal cost.
(d) Explain monopoly in power auction.