BE **Semester-_VIII__(Electrical) Question Bank**

(Electrical machine design II)

All questions carry equal marks(10 marks)

Q.1	Explain steps for design of field winding of synchronous machine.
Q.2	Explain evaluation of Direct and Quadrature axis reactance of Alternator.
Q.3	Explain hunting in Synchronous machine.
Q.4	Explain Design of damper winding
Q.5	Discuss factors affecting selection of air gap in synchronous machine
Q.6	Determine the main dimensions of a 10 MVA, 13.8KV, 50Hz, 1500 rpm, 3 star connected synchronous generator. The additional data is given as: Bav= 0.6wb/m2, ac=42000 ac/m and v=80m/s
Q.7	Derive an output equation of a 3 phase induction motor. How D and L are estimated from this equation.
Q.8	Briefly discuss factors affecting determining air gap length in induction motor design.
Q.9	Explain harmonic induction and harmonic synchronous torques produced in induction motor.
Q.10	What do you mean by specific electric loading applied to electric machines? State the factors on which the choice of these loadings depends.
Q.11	Discuss the role of damper winding in synchronous motor.
Q.12	state important design difference between turbo alternators and hydro generators.
Q.13	Discuss effect of variation of air gap length on performance of synchronous machine.
Q.14	Define SCR applied to synchronous machine and prove that it is reciprocal of synchronous reactance.
Q.15	Explain the term SCR and its effects on synchronous machine performance
Q.16	Draw flow chart and write algorithm steps for design of submersible motors
Q.17	Write note on selection of number of armature slots in synchronous machine
Q.18	Calculate (1) main dimension of stator ,(2) no. of stator slots and (3) winding turns per phase for a 22.5 kw , 3 ph. , 440 V , 960 rpm , 50 hz, delta connected induction motor for overall good electrical design. Assume ac/m = 25000 ; Bav = 0.46T, ; p.f. = 0.87 and peripheral velocity should not exceed 30 m/sec
Q.19	What is Dispersion coefficient? Explain the effect of Dispersion coefficient on maximum output power factor.
Q.20	Write a note on computer aided design of Induction motor. Explain algorithm steps to find main dimensions.
Q.21	An induction motor details are as follows: Poles= 6, stator slots=72 conductors/stator slots= 15 Rotor slots=55 Coil span= 11 slots and Phase spread=60 degree. Find current in end rings Ie and current in rotor bars Ib.
Q.22	Explain the importance of circle diagram in the design of three phase induction motor.
Q.23	Discuss factors affecting the length of air gap on performance of a three phase induction motor.
Q.24	Explain which combinations of number of stator and rotor slots should be avoided in the induction motor design ? why?
Q.25	Explain methods of Improving starting torque of Induction Motor.

Q.26	Discuss how end ring of an induction motor is designed.
Q.27	Explain design considerations to eliminate harmonics in synchronous machines..
Q.28	State the rules for the selection of rotor slots. Describe the methods for reducing the effect of harmonics torque.
Q.29	Discuss selection criteria for specific magnetic loading
Q.30	Write note on different types of rotor slots
Q.31	Discuss the effect of “skewing” on the performance of three phase induction motor.
Q.32	Discuss different types of leakage reactance in three phase induction motor.
Q.33	What is synchronous curps? Discuss methods to avoid them.
Q.34	Explain the terms “critical speed” and “run away speed” with reference to synchronous machine.
Q.35	Compare squirrel cage induction motor with wound rotor machine with design point of view.
Q.36	Explain selection criteria for specific electrical loading.
Q.37	Derive output equation for synchronous machine.
Q.38	Write short note on design of salient pole machine.
Q.39	Discuss in details the advantages of circular poles and bar windings with multi turn coil.
Q.40	Determine suitable stator dimensions for a 500 kva , 50 Hz 3 phase alternator to run at 375 rpm. Mean gap density over the pole pitch as 0.55 wbr/ sq meter. The specific electric loading is 25000 A/m . The peripheral speed should not exceed 35 m/s.