IMPORTANT QUESTIONS

Q.1 What are the conditions of ideal transformer? Develop the phasor diagram of single phase transformer for resistive, capacitive and inductive load.

Q.2What is autotransformer? Compare the weight of copper used in autotransformer and two winding transformer.

Q.3 Discuss graphically how a rotating field is produced in the air-gap of three phase induction motor. What is the speed of this field and how it's rotational direction is reversed.

Q.4 Can a single phase motor be self starting? If not, how can they be started?

Q.5 Explain in brief the principal of operation of servo motor and give their applications.

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Q.7 Explain the working of reluctance motor. Also give it's applications.

Q.8 Explain torque-slip characteristics of three phase induction machine. Also derive the condition of maximum torque.

Q.9What are different types of rotor in induction machine ? Explain your answer.

Q.10 How V-curves of synchronous motor can be obtained? Discuss their importance also.

Q.11 Derive the equation for emf in case of synchronous machine.

Q.12 Explain the working principle of synchronous motor.Give it's applications

Q.13 Give the differences between induction machine and synchronous machine.

Q.14 What are eddy currents? Explain their nature. Suggest a remedy for reducing such currents.

Q.15 State and Explain laws of Electromagnetic induction and explain static and dynamic emfs.

Q.16 Discuss the concept of co-energy in electromechanical energy conversion.

Q.17 Show that the reaction of coupling magnetic field on the electrical or mechanical system is essential for the electromechanical energy process.

Q.18 A ring of iron has a mean diameter of 15cm, a cross section of 1.5square cm and has a radial air-gap of 0.5mm cut in it. It is uniformly wound with 1500 turns of insulated wire and a current of 1.2A produces a flux of 0.1wb across the gap. Calculate the relative permeability of iron, on the assumption of no magnetic leakage.

Q.19 Derive the equation of emf for single phase transformer.

Q.20Derive the speed-torque characteristics of dc motor and dc generator.

Q.21Draw the complete phasor diagram of a transformer on load.

Q.22 Define the Voltage regulation of a transformer. Deduce the expression for Voltage regulation.

Q.23 Obtain the equivalent circuit of a 200/400 V, 50 Hz single phase transformer from the following test data.

O.C. test : 200V, 0.7 A, 70 W on L.V. side
S.C. test : 15V, 10A, 85W on H.V.side
Calculate the secondary voltage when delivering 5Kw at 0.8 p.f lagging, the primary voltage being 200V.

Q.24A transformer has a primary winding of 800 turns and a secondary winding of 200turns. When the load current on the secondary is 80A at 0.8 power factor lagging, the primary current is 25A at 0.707 power factor lagging. Determine graphically or otherwise the no-load current of the transformer and it's phase with respect to the voltage.

Q.25 The magnetic circuit has dimensions: Ac=4*4 cm^2 , lg= 0.06cm,lc=40cm; N=600 turns. Assume the value of μ_r=6000 for iron .Find the exciting current for B_c=1.2T and corresponding flux and flux linkages.

26.The induced emf in a dc machine while running at 500rpm in 180V.Calculate the induced emf while the machine is running at 600rpm.

27.The armature supply voltage of a dc motor is 230V. The armature resistance is 0.8ohm and the speed is100 rad/s. Calculate (a) the induced emf, (b)the electromagnetic torque, (c)the power input to the armature, (d)the mechanical power developed by the armature, and (e) the armature copper losses.

28.Explain why a dc motor should not be started direct-on line.

29.Explain how efficiency of a dc machine can be found out without actually loading the machine.

30.If the emf in the stator of an 8-pole induction motor has a frequency of 50Hz, and that in the rotor 1.5Hz, at what speed is the stator running and what is the slip.
31.The power input to a three-phase induction motor is 50kw and the corresponding stator losses are 2kw. Calculate (a)the total mechanical power developed and the rotor I^2R losses when the slip is 3per cent, (b)the output horse power of the motor if the friction and windage losses are 1.0kw, and (c)efficiency of the motor

32.Explain why an induction motor draws heavy current as compared to it's full load current at starting.

33.Explain why the power of an induction motor is very low at starting.

34.Explain why an induction motor cannot run at synchronous speed.

35.Name the different methods of speed control of a polyphase squirrel cage induction motor. What are the limitations and disadvantages of this method?

36. State two important applications of synchronous motor giving reasons.

37.An overexcited synchronous motor is called a synchronous condenser, explain.

38.Explain the effect of change of excitation of a synchronous motor on its power fator.

39.Explain why a synchronous motor does not have starting torque. Explain one method of starting synchronous motor.

40.State the need for parallel operation of alternators. What are the conditions for parallel operation of three-phase alternators.

41.Explain the advantages of having a rotating field system rather than a rotating armature system in a synchronous machine.

42.Write the expression, showing the relationship between speed, frequency and number of poles of a synchronous machines. The speed of rotation of the turbine driving an alternator is 166.7 rpm. What should be the number of poles of the alternator if it is to generate voltage at 50Hz.

43.Name the various types of single-phase induction motors manufactured in fractional kilowatt ratings.

44.Explain why a single phase induction motor should be provided with an auxiliary winding on the stator.

46.Explain the main constructional features and principle of a reluctance start single phase induction motor.

47.Compare the various methods of speed control of dc motors.

48. Draw and explain torque-speed characteristics for the following types of dc motors:
(i) shunt motor (ii) series motor and (iii) compound motor.

49.Deduce the equation for speed of a dc motor.

50.Mention the important point of difference in the design between a power transformer and a distribution transformer.