KHAJA BANDANAWAZ UNIVERSITY

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Faculty of Engineering and Technology

Second semester B.E. Degree Examination

Subject: - **Basic Electrical Engineering** [**19KBELE15/25**]

Time: 3Hrs. **Max.Marks:100**

MODEL QUESTION PAPER-I

SECTION-A

I. Answer any TEN questions from the following. **(02Marks Each)**

Q.1) Define Kirchhoff 's current law.

Q.2) State fleming's right hand rule .

Q.3) Mention the expressions for different types of A.C power.

Q.4) what is the phase angle and power factor for the pure Resistance.

Q.5) Mention applications of a Transformer.

Q.6) Why core is laminated in a Transformer.

Q.7) What is Fuse?.why it is used.

Q.8) Why earthing is necessary.

Q.9) Which motor to be recommend for high starting torque with load.

Q.10) what is the difference between armature torque and useful torque

Q.11) A 3-phase 440V,50 Hz induction motor has a 4% slip.Find the frequency of the rotor current

Q.12) what should be the slip,so that the rotor of a 3-phase induction motor is blocked.

Q.13) Mention different types of rotors used in 3-phase induction motors.How they differ

Q.14) Find synchronous speed,if frequency is 50 Hz,poles=4.

Q.15) Mention Types of rotors in alternators and compare.

SECTION-B

II. Answer any FIVE full questions from the following. (08 Marks Each)

Q1 a) Bring out clearly analogy between magnetic & electric circuit 04M

b) Define coefficient of coupling and find its relation with L1, L2 and M 04M

Q2 a)Mention the advantages of three phase system over single phase system. 04M

b) Explain the various losses that occur in a transformer 04M

Q3 a) with the help of connection diagram, Explain the two way control of lamps with truth table 04M

b) Discuss the following characteristics for series motor with relevant plots. i) Ta v/s Ia ii) N v/s Ia 04M

Q4 A 4 pole, lap wound DC shunt generator delivers 200 A at terminal voltage of 250 Volts. It has a field and armature resistance of 50 Ohms and 0.05 Ohms respectively. Neglecting brush drop determine i) Armature current ii) Current per parallel path iii) EMF generated iv) Power developed. 08M

Q5 A 3 phase, 6-poles 50Hz induction motor has a slip of 1% at no load and 3% at full load. Determine (i) The synchronous speed (ii) No-load speed (iii) Full load speed (iv) frequency of rotor current at standstill (v) frequency of rotor current at full load. 08M

Q6 With neat sketch explain the construction of salient pole Alternator. 08M

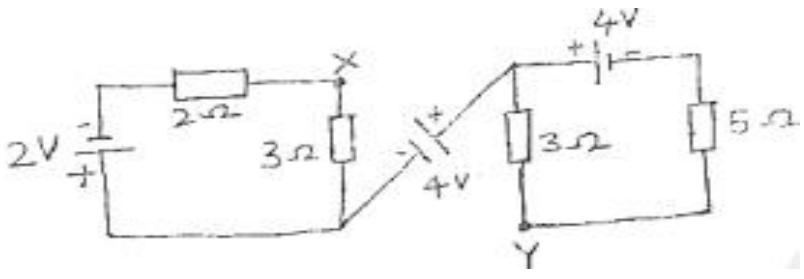
Q7 With a neat sketch explain the construction of various parts of a D.C Machine 08M

Q8 The maximum efficiency at full load and Upf of a single phase, 25 KVA, 500/1000 V, 50 Hz transformer is 98%. Determine the efficiency at i) 75% load, 0.9 pf ii) 50% load, 0.8 pf iii) 25% load, 0.6 pf. 08M

SECTION-C

III. Answer any FOUR Full Questions from the following (10 Marks Each)

Q1 a) Obtain the potential difference between V_{XY} in the following circuit



05M

b) Derive an expression for dynamically induced emf . 05M

Q2 A series circuit consists of a Resistance of 10 Ω, an inductance of 16 mH and a capacitance of 150 μF connected in series. A supply of 100V at 50 Hz is given to the circuit. Find the impedance,current, Power factor, and power consumed by the circuit 10M

Q3 With the help of circuit diagram and vector diagram show that two wattmeter's are sufficient to measure total power in a balanced three phase circuit. 10M

Q4) a) Define RMS value of alternating current ,show that its value is proportional to maximum value. 05M

b) Derive the EMF equation of a DC generator 05M

Q5) a) Explain the various losses that occur in a transformer. 05M

b) Explain the necessity of starter for a DC motor 05M

Q6) a) With a neat diagram explain any one type of earthing 05M

b) Explain the different types of precautions against an Electrical shock 05M

Q7) a) state fleming's left hand rule. Mention its application. 04M

b) With a circuit diagram explain the working of a star-delta starter for a three phase induction motor. 06M