

Code No: R22024

R10**SET - 1****II B. Tech II Semester Supplementary Examinations, November-2017****ELECTRICAL MACHINES - II**

(Electronics and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** QuestionsAll Questions carry **Equal** Marks

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1. a) Explain the construction aspects and working principle of a transformer (7M)  
b) The Voltage per turn of a single phase transformer is 1.1 V. When the primary winding is connected to a 220V, 50 Hz a.c supply, the secondary voltage is found to be 550 V. Find i)Primary and secondary turns and ii)Core area if the maximum flux density is 1.3 Tesla. (8M)
2. a) Explain the concept of transformer on No – Load with a neat vector diagram. (7M)  
b) Draw the equivalent circuit of the transformer and explain how you have achieved it. (8M)
3. The primary of the transformer is rated at 10A. On open circuit the readings are  $V_1 = 1000V$ ,  $V_2 = 500V$ ,  $I = 0.42A$  and  $P_{oc} = 100W$ . On short circuit the readings are  $I_1 = 10A$ ,  $V_1 = 126V$  and  $P_{sc} = 450W$ . Draw an equivalent circuit for the transformer and determine the parameters. Predict the output voltage across a load impedance  $Z_L = (19 + j12)\Omega$  (15M)
4. a) Explain the concept of open –  $\Delta$  or V – V connection and Scott or T – T connection in detail. (7M)  
b) Explain with the help of connection diagrams the operation of off – load and on – load tap changers. (8M)
5. a) Compare between the Squirrel Cage Motor and Wound rotor motor in Induction machines (7M)  
b) Explain the Principle of Operation of Induction Motor and also give the advantages and disadvantages of it. (8M)
6. a) Draw the equivalent circuit of a Three – phase Induction motor and explain how you have achieved the representation (7M)  
b) An 8 –pole, 50 Hz, three phase induction motor has rotor input of 100 KW on full load. The rotor emf makes 120 cycles per minute. Calculate i) rotor speed in rpm ii) rotor copper loss iii) mechanical power developed, and iv) rotor resistance per phase if rotor current is 80 A per phase. (8M)
7. a) Derive the necessary condition for maximum torque in an Induction Motor (7M)  
b) Draw and explain the Torque – Slip characteristics of a Three Phase Induction Motor (8M)
8. Write Short notes on the following: (15M)  
i) Direct Online starter(DOL), ii) Crawling and Cogging and iii) Induction generator