Printed Pages: 02 **Sub Code: EAG401/AG401**

Paper Id: | 1 | 8 | 0 | 4 | 0 | 1 | **Roll No.** [redacted]

B. TECH.

(SEM-IV) THEORY EXAMINATION 2017-18

ELECTRICAL CIRCUIT & MACHINE

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

a. Explain the Kirchhoff's law.
b. Explain low band pass filter.
c. Dependent and independent sources.
d. State and explain the maximum power transfer theorem.
e. What do you mean by composite filters?
f. Why carbon brushes are being used in d.c. machine?
g. Under which situation during the measurement of 3 phase power by two wattmeter method, one wattmeter start giving reading in negative direction.
h. RMS value of alternating current.
i. Give the statement of Thevenin's theorem.
j. What is meant by resonant frequency?

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

(a) What is armature reaction? Describe the effects of armature reaction on the operation of dc machines.

(b) Why starter is required? Explain the construction and working of a three point starter.

(c) The efficiency of a 1000 kVA, 110/220 V, 50 Hz, single phase transformer is 98.5% at half load and full load at 0.8 p.f. leading and 98.8% at full load unity p.f. Determine (i) Iron loss (ii) full load copper loss (iii) maximum efficiency at upf (iv) load kVA at maximum efficiency.

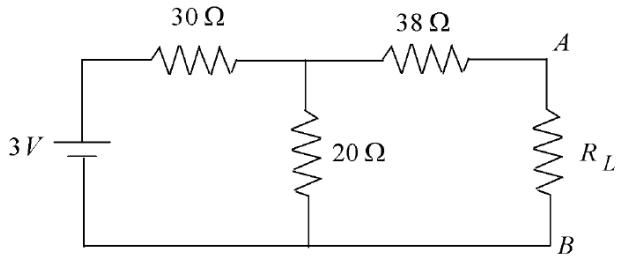
(d) Discuss why single phase induction motors do not have starting torque. Explain its principle of operation and list various methods of starting.
Also discuss the speed-torque characteristic of any one of the 1phase induction motor.

(e) Explain Thevenin's Norton superposition power transfer in detail.

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

(a) Explain maximum power transfer theorem. Also find the value of load resistance R_L in the given diagram and determine the maximum power transferred.



(b) Write short notes on

(i)EMF and torque equation.

(ii)Leakage resistance

(iii)Voltage regulation

(iv)Hysteresis loss

4. Attempt any *one* part of the following: 10 x 1 = 10

(a) Explain the construction and working of poly phase induction motor with circuit and phasor diagram.

(b) Why starter are necessary for starting of 3 phase induction motor? Explain the working of rotor resistance starter for 3 phase slip ring induction motor.

5. Attempt any *one* part of the following: 10 x 1 = 10

(a) Explain the terms average power, power factor, Instantaneous power and reactive power.

(b) Explain the procedure to convert star connected network into delta connected network and delta connected network into star connected network.

6. Attempt any *one* part of the following: 10 x 1 = 10

(a) Explain the speed control methods of DC Motor.

(b) Why improvement of power factor is needed? Explain.

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) Explain two wattmeter method of measurement of 3 phase power with the help of circuit and phasor diagram.

(b) A voltage waveform is given by expression v=150 sin (520t+50). Determine :
(i) Maximum Value
(ii) RMS Value
(iii) Frequency
(iv) Time Period
(v) Phase angle of voltage