12/12/16

Roll No. | | | | | | | |

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TEE–101

B. Tech. (First Semester)
End Semester EXAMINATION, 2016
(All Branches)
BASIC ELECTRICAL ENGINEERING

Time : Three Hours] [*Maximum Marks : 100*

Note : (i) This question paper contains five questions.

(ii) All questions are compulsory.

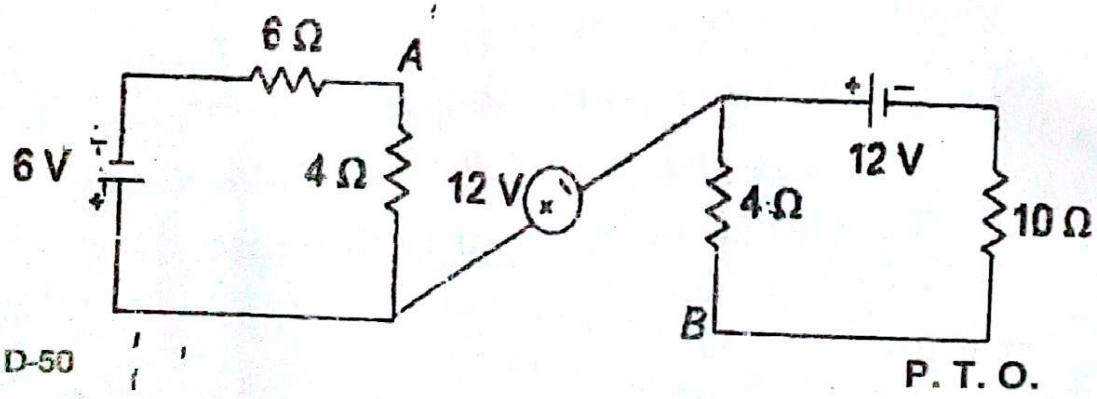
(iii) Instructions on how to attempt a question are mentioned against it.

(iv) Total marks assigned to each question are **twenty.**

1. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) State KCL, KVL and Ohm's law in detail.

(b) What is the voltage across A and B in the circuit shwon in Fig.



(c) State Thevenin's theorem. Explain with a suitable example.

2. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) Define the following terms with example :

(i) Peak factor

(ii) Form factor

(iii) Quality factor

(b) A series RLC circuit with R = 10 ohms, L = 10 mH and C = 1 mF has an applied voltage of 200 V at resonant frequency. Calculate the resonant frequency, the current in the circuit and the voltages across the elements at resonance. Find also the quality factor and bandwith.

(c) Draw Parallel Magnetic Circuit. What is Analogy between Electrical and Magnetic Circuit ?

3. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) Explain Hysteresis and Eddy Current loss in alternating field.

(b) The reading on two wattmeter's connected to measure power are 6.0 kW and 1.0 kW; the latter reading being obtained after reversal of

the current in the current coil. Calculate the total power and the power factor of the load.

(c) What is meant by O. C. and S. C. test in single-phase transformer ? Explain with the help of equivalent circuit.

4. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) Explain the principle and construction of D. C. Motor with suitable diagram.

(b) A 5 kVA 250/500 V, 50 Hz, single-phase transformer gives the following test results :

No-load test (LV side)	250 V	0.75 A	60 W
Short circuit test (HV side)	9 V	6 A	21.6 W

Calculate :

(i) Find the value of x (load factor) for which maximum efficiency obtained.

(ii) Determine efficiency for half load at 0.8 p.f. lagging.

(c) Prove that total power in three phase balanced circuit can be measured by two wattmeter method.

5. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) Explain the concept of three-phase Rotating Magnetic Field

(b) A d. c. shunt machine connected to 250 V supply has resistance of armature as 0.1 and of field winding as 100. Find the ratio of the speed as a generator to the speed as a motor when the line current in each case is 80 A.

(c) A parameter load is to be driven at about 700 r. p. m. What should be the number of poles for a 3-ϕ induction motor when :

(i) $f = 60$ Hz ?

(ii) $f = 50$ Hz ?

Calculate the actual speed in each case if the rated slip is 4%.