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24007

B. Tech. 1st Semester

(Common for All Branches)

Examination – December, 2017

ELECTRICAL TECHNOLOGY

Paper : EE-101-F

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

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 (Section-A) is ***compulsory***. Attempt ***four*** more questions from remaining four Sections : **B, C, D & E** by selecting ***one*** question from each Section. Use of non-programmable scientific calculator is allowed.

SECTION – A

1. (a) Define maximum power transfer theorem. 5

(b) Discuss the physical significance of power factor in AC system. 5

(c) Derive E.M.F. equation of 1-ϕ transformer. 5

(d) Explain Faraday's law of Electromagnetic Induction in brief. 5

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SECTION – B

2. (a) State and explain Kirchoff's laws. 10

   (b) Derive the equation for Star to Delta and Delta to Star transformation in DC networks. 10

3. State and explain Norton's theorem by taking some suitable example of DC electric network. 20

SECTION – C

4. (a) Differentiate between acceptor and rejecter circuits. 10

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   (b) Define the terms : 10

   (i) Active power

   (ii) Reactive power

   (iii) Apparent power

5. Derive the mathematical equation for RMS and Average values of a sinusoidal signal. 20

SECTION – D

6. Derive the relation between V_L and V_{phase} in 3–ϕ star connected AC system and also derive the equation power in 3–ϕ star connected AC system. 20

7. Draw and explain the phasor diagram of 1–ϕ transformer at capacitive load. 20

SECTION – E

8. (a) Discuss and explain different types of losses present in D. C. machines. 10

   (b) Draw and explain the construction and working principle of D. C. generator. 10

9. Write short notes on : 20

   (a) Induction type Wattmeter.

   (b) Restoring and Damping in measuring instruments.

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