TED (10) 4036
(Revision-2010)

A21-P0561A

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, APRIL - 2021

POLY PHASE CIRCUITS AND TRANSFORMERS

[Maximum marks: 100] (Time: 3 Hours)

PART – A

[Maximum marks: 10]

(Answer all questions in one or two sentences. Each question carries 2 marks)

I. (1). What do you mean by the term phase sequence in poly phase system.

(2). Write down the EMF equation of a transformer.

(3). Write down the losses in transformers.

(4). Define the term all day efficiency of transformer.

(5). What is an autotransformer. (5 x 2 = 10)

PART – B

[Maximum marks: 30]

(Answer any five of the following questions. Each question carries 6marks)

II. (1). Discuss the phase sequence at load.

(2). Briefly describe the working of transformer.

(3). Derive the condition for maximum efficiency of a transformer.

(4). Briefly discuss open delta connection.

(5). Draw and explain the equivalent circuit of a single phase transformer .

(6). Explain the advantages of autotransformers over two winding transformers.

(7). Draw the constructional details of auto transformers. (5 x 6=30)

PART – C

[Maximum marks: 60]

(Answer one full question from each unit. Each question carries 15 marks)

UNIT – I

III. (a). Three identical impedances are connected in delta to a three phase supply of 400V . the line current is 37.65A and the total power taken from the supply is 3.4KW. Calculate the resistance and reactance value of each impedances . (7)

(b). Draw and explain the circuit diagram for two wattmeter method of power measurement in three phase system. (8)

OR

IV. (a). Obtain the relation between line and phase values in star connection with the help of vector diagram. (7)

(b). Explain about the variation of wattmeter reading with power factor in two wattmeter method, when p.f is zero, unity 0.5 lag & lead and in between zero & 0.5 lag. (8)

UNIT-II

V. (a). Draw the vector diagram of transformer for different kinds of loads. (8)

(b). Discuss the core assembly of both core type and shell type transformers . (7)

OR

VI. (a). Show that the net flux passing through the core of a transformer is almost independent of the load condition. (8)

(b). Derive the expression for the approximate voltage drops in a transformer. (7)

UNIT-III

VII. (a). Explain the SC and OC test on single phase transformer. (8)

(b). Explain with circuit diagram how regulation and efficiency of a transformer is determined by conducting OC and SC test. (7)

OR

VIII. (a). Explain different connection used in three phase transformers. (8)

(b). Briefly describe the purpose of providing tertiary winding. (7)

UNIT-IV

IX. (a).Explain the applications of auto transformer. (7)

(b). Explain the voltage control of transformers by tap changing arrangement. (8)

OR

X. (a). Explain off load tap changer with a neat sketch. (8)

(b) Compute the saving of copper in autotransformers (7)

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