



Tertiary and Vocational Education Commission

Electrical Technology- Part II

NCT Equivalence Examination



Instructions:

Duration – 03 Hrs.

01. This paper consist **Five (05)** questions.
02. Each question has **Part A** and **Part B**.
03. Answer only **One Part (Part A or Part B)** of each question.

1.0 Part A

Explain briefly with applications and provide necessary neat sketches

- I. Visual inspection
- II. Insulation resistance test
- III. Continuity test
- IV. Earth electrode resistance test
- V. Earth fault loop impedance test

(04 x 5 = 20 Marks)

1.0 Part B

- I. Why, winding temperature is Important for the electric motor? Provide two examples
- II. Briefly explain the insulation class of the motor
- III. What are the three basic maintenance philosophies of condition-based maintenance?
- IV. What are the benefits of condition-based maintenance?

(05 x 4 = 20 Marks)

2.0 Part A

- I. What are the IEC standards of three-phase colors in the five-wire system?
- II. Briefly explain the single-phase transformer and three-phase transformer, provide necessary neat sketches.
- III. What are the advantages of single-phase rectification and three-phase rectification? Explain shortly, through the necessary industrial applications and provide neat sketches.
- IV. What are the main elements of the electronic power supply? and explain each element through a block diagram.

(05 x 4 = 20 Marks)

2.0 Part B

Provide short explanations of the below topics and draw necessary neat sketches.

- I. Self-induction
- II. Mutual induction
- III. lenz's law
- IV. Ideal transformer
- V. Magnetizing current

(04 x 5 = 20 Marks)

3.0 Part A

- I. What is the difference between ferrite core transformer and lamination core transformer?
- II. What is the difference between the linear and switched-mode power supply (SMPS)?
- III. Draw a neat sketch of the SMPS and list the essential elements
- IV. What is the main purpose of the Uninterrupted Power Supply?
- V. Draw the basic block diagram of the Uninterrupted Power Supply?

(04 x 5 = 20 Marks)

3.0 Part B

- I. Provide short explanations of the below topics of the well-known batteries and give advantages, disadvantages, and applications
 - a) Lead Acid
 - b) NiCd
 - c) NiMH
 - d) Li-iron
 - e) LiPo
- II. What is the main purpose of the battery management system (BMS)?
- III. What are the basic specifications of the battery? When you order one
- IV. List basic charging methods of batteries.

(05 x 4 = 20 Marks)

4.0 Part A

- I. What is the bulk power supply (BPS) and provide its important features?
- II. Provide short explanations of the below topics with necessary neat sketches
 - a. Electrical power generation
 - b. Electrical power transmission
 - c. Electrical power distribution
- III. What are the low voltage earthing systems? List and briefly explain using necessary neat sketches.
- IV. Draw and briefly explain through a block diagram of industrial wiring and name essential parts

(04 x 5 = 20 Marks)

4.0 Part B

- I. Draw a neat sketch of the three-phase brushless self-excited alternator and list essential parts
- II. Briefly explain the above-drawn sketch and how to generate the three-phase electricity.
- III. Explain what is importance of auto voltage regulator (A.V.R) for alternator and draw a neat sketch.
- IV. Briefly explain and draw a neat sketch of how to connect the CEB power and generator power for the factory using a manual changeover switch.

(04 x 5 = 20Marks)

5.0 Part A

- I. Briefly describe function of auto transfer switch (ATS)
- II. Draw a control circuit diagram of ATS
- III. Describe operation of ATS using control circuit diagram you are drawn
- IV. Why interlocking systems is importance for ATS

(04 x 5 = 20Marks)

5.0 Part B

- I. Briefly explain the following terms associated with circuit breakers
 - a) Braking capacity
 - b) Making capacity
 - c) Short time rating
- II. State the type of circuit breakers according arc extinguishing media
- III. Describe how to operate the circuit by remotely
- IV. What is the deferent between air circuit breaker and oil circuit breaker?

(04 x 5 = 20 Marks)