Ref No: **Ex/EE/PE/H/T/326B/2024**

B.E. ELECTRICAL ENGINEERING, THIRD YEAR SECOND SEMESTER EXAM 2024

SUBJECT: - CONDITION MONITORING OF ELECTRICAL SYSTEMS (HONS.)

Full Marks 100

Time: ~~Two hours~~/Three hours/ ~~Four hours/ Six hours~~ (50 marks for each part)

Use Separate Answer scripts for each Part

Part I

Q 1.	(a) What do you understand by the term "Condition Monitoring"? How does it differ from protection? or (b) Discuss in brief, the different courses of maintenance actions and their relative advantages and disadvantages?	10
Q 2.	(a) Discuss : How machine specification is related to machine failure? or (b) Discuss in brief what is "environmental aging" of electrical machines and what are its effects?.	10
Q 3.	Write short notes on (any two) a) Surface Tracking and Moisture absorption b) Thermal edging c) Cooling system failure	10
Q 4.	(a) Discuss in brief what the common faults of large Induction Motors are. or (b) Discuss in brief, what are the common faults of electrical machines and what are the effects?	10
Q 5.	Define the following terms (any five): Availability; time of failure; time of repair; failure rate; time between failure; mean time between failure	5x2

[Turn over

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B.E. ELECTRICAL ENGINEERING EXAMINATION, 2024

(3rd Year, 2nd Semester)

CONDITION MONITORING OF ELECTRICAL SYSTEMS (HONS.)

Time: Three Hours | Full Marks: 100

(50 mar h part)

Use a **separate** Answer-script for each Part

PART-II

Answer ***any three*** questions

Two marks are reserved for neat and well-organized answer script

1. a) Why is condition monitoring of electrical equipment necessary? 3

   b) Explain several ways in which condition monitoring enhances asset reliability and productivity. 5

   c) What are the primary and secondary advantages of implementing condition monitoring for electrical equipment? 5

   d) Can you define optimizing asset operation using a decision support system? 3

2. a) Using an appropriate diagram, illustrate the insulation resistance (IR) testing method. What factors influence IR readings? 10

   b) Could you elaborate on the time-resistance method used in IR testing? 6

3. a) Define the Polarization Index (PI) test and the Dielectric Absorption (DA) test. How do these tests help assess insulation condition? 10

   b) Why is step voltage testing conducted to evaluate insulation condition? 6

4. a) Discuss the distinction between leakage current and dielectric current in evaluating insulation condition. What are the objectives of the dielectric voltage withstand test? 5+5

   b) How can false failures occur during this test? 6

5. Provide brief explanations on (i) switchgear monitoring, (ii) condition assessment of cables, and (iii) transformer testing. 5+6+5