SUBJECT CODE NO:- P-339
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(EEP/EE/EEE) Examination MAY/JUNE-2016
Testing & Maintenance of Electrical Equipment
(Revised)

[Time: Three Hours]   [Max Marks:80]

"Please check whether you have got the right question paper."

N.B   i) Q.No.1 and Q.No.6 are compulsory.
               ii) Solve two questions in each section from remaining.

Section A

Q.1 a) Fill in the blanks.   04
         i)   The main reason of deterioration of the insulation is -------------- in transformer oil.
         ii)   The sleeve is used to insulate the winding -----------.
         iii) The earth electrode should not have the resistance more than --------- ohms.
         iv)   The capacitor is used in a single phase I.M. for ------------------- purpose.

     b) Choose correct answer: 06
         i)   In the 1-ph transformer, the polarity of HV & LV windings should be,
               a) Same   b) 180^0 opposite   c) Additive   d) subtractive
         ii)   The transformer core are laminated to minimize.
               a) Eddy current loss   b) Cu-loss   c) power factor   d) Hysteresis loss
         iii) In a 3-phase transformer, the winding placement should be
               a) LV over HV   b) HV over LV   c) HV parallel on next limb   d) None of these

Q.2 a) Write down the detailed procedure for re-winding of a transformer with neat sketches.   08
     b) Explain concept of tolerance in testing with suitable examples & tolerance in measurement with   07
         suitable example.

Q.3 a) Differentiate between the three testing's.   07
         i)   Type test   ii) Routine test   iii) On-site test
     b) Differentiate between direct & indirect testing. Give suitable example; in view of a maintenance activity. 08

Q.4 a) Write down the method of testing to find out following faults in manufacturing of transformer.   08
         i)   Turn to turn short circuit fault.
         ii)   Open circuited turn fault.
         iii) Magnetic imbalance fault.
         iv)   In sufficient insulation faults.
     b) How will you measure the earth resistance for your computer laboratory? Explain.   07

Q.5 Write short notes on any three.   15
         i)   Various reasons for overheating of transformer during its operation.
         ii)   Various oil tests on transformer oil.
         iii) How to remove magnetic imbalance fault during operation & maintenance.
         iv)   Heat run test on 3-ph transformer.

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Section B

Q.6 a) For what you will use following testing methods? (In one sentence.)   06
            i)   Resistance testing   ii) Radiography testing   iii) DGA testing   iv) Megger testing
            v)   Sonography testing   vi) HV withstand testing.

    b) Select correct answers.   04
            i)   Stator –Rotor air gap gets deformed, during running ,the most probable reason is →
                a) Stator core is deformed   b) Rotor core in deformed
                c)Motor foundation un proper d) Bearings jammed
            ii)   Winding resistance found 20% reduced; the reason is
                a) Conductor is broken   b) Short circuit between winding & core
                c)   Turn to turn fault in winding   d) Stator to core short circuit.
          iii) Motor temperature becomes very high; the reason is,
                a) Motor has short circuit in stator winding.
                b) Motor has short circuit in rotor winding.
                c) Motor has over load.
                d) Motor run on high voltage.
         iv)   transformer has excessive vibration; the test instrument is
                a) Ultrasonic   b) X-ray   c) EM swing   d) Megger

Q.7   a) List out the probable faults, during manufacturing of 1-ph I.M. & write the various reasons for   07
           development of each fault.
        b) Name any four tests, used for the preventive maintenance of 3-ph I.M during working condition. Explain 08
           with neat sketch any one test in details.

Q.8   a) Draw the flow chart of I.M manufacturing process including in process tests.   07
        b) The 3-ph I.M shows Turkey rotation, what kind of fault could be there? Justify your diagnosis. In support 08
           draw the needed sketch.

Q.9   a) What are the effects of weakening of insulation between core & winding of an I.M? What remedy you 07
           will support if insulation is weak.
        b) Explain with neat sketches, the working of S.M swing (vibration testing) equipment.   08

Q.10   Write short notes on <u>any three</u>.   15
            i)   HV test on IM.
            ii)   Routine testing on IM.
            iii)   Meggering on I.M. of 100 HP motor.
            iv)   Testing of I.M. starters.

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