Reg. No. :

Question Paper Code: 31032

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Electrical and Electronics Engineering

01UEE302 - DC MACHINES AND TRANSFORMERS

(Regulation 2013)

Duration: One hour   Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The principle of dynamically induced emf is utilised in

    (a)) Choke   (b) Transformer
    (c) Generator   (d) Thermocouple

2. Hysteresis loss can be minimised by selecting a magnetic material having

    (a) large B/H loop area   (b) High resistivity
    (c) High retentivity   (d) Low hysteresis coefficient

3. Which generator has poorest voltage regulation?

    (a) Series   (b) Shunt
    (c) Long shunt compound   (d) Short shunt compound

4. Interpole winding is connected in

    (a) Series with armature   (b) Series with main poles
       (c) Parallel with armature   (d) Parallel with main poles

5. The speed of the dc motor can be controlled by varying

   (a) Its flux per pole   (b) Resistance of armature circuit

   (c) Applied voltage   (d) All of the above

6. The direction of rotation of conductors of a DC motor can be determined by

   (a) Ampere law   (b) Fleming's left hand rule

   (c) Fleming's right hand rule   (d) Lenz's law

7. If a transformer primary is energised from a square wave voltage source, its output voltage will be

   (a) Square wave   (b) Sine wave

   (c) Pulse wave   (d) Triangular wave

8. Transformer action requires a

   (a) Constant magnetic flux   (b) Increasing magnetic flux

       (c) Alternating magnetic flux   (d) Alternating electric flux

9. One of the main advantages of Swinburne's test is that it

   (a) its applicable for shunt motors   (b) needs one running cost

   (c) its very economical and convenient   (d) ignore any charge in iron loss

10. The main purpose of performing open-circuit test on a transformer is measure its

   (a) cu loss   (b) core loss

   (c) total loss   (d) insulation resistance

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Explain an expression for co-energy of multiply excited magnetic field systems with neat sketch. (8)

12. A 4 pole generator supplies a current of 143 *A*. It has 492 armature conductors (A) wave wound (B) lap wound. When delivering full load, the brushes are given an actual lead of *10°*. Calculate the demagnetizing amp-turns/pole. This field winding is shunt connected and takes *10A*. Find the number of extra shunt field turns necessary to neutralize this demagnetization. (8)

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13. Draw the diagram and explain the working of three point starter of a DC shunt motor. Also compare the three point and four point starters. (8)

14. Derive the expression for the EMF equation of single phase transformer. (8)

15. Determine the open circuit and short circuit test on single phase transformer. From that explain how to calculate regulation and efficiency of transformer. (8)

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