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**Question Paper Code: 43302**

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

Third Semester

Electrical and Electronics Engineering

14UEE302 - DC MACHINES AND TRANSFORMERS

(Regulation 2014)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

**(Answer any six of the following questions)**

- The principle of dynamically induced emf is utilised in
  - Choke
  - Transformer
  - Generator
  - Thermocouple
- Hysteresis loss can be minimised by selecting a magnetic material having
  - large B/H loop area
  - High resistivity
  - High retentivity
  - Low hysteresis coefficient
- Which generator has poorest voltage regulation?
  - Series
  - Shunt
  - Long shunt compound
  - Short shunt compound
- Interpole winding is connected in
  - Series with armature
  - Series with main poles
  - Parallel with armature
  - Parallel with main poles
- The speed of the dc motor can be controlled by varying
  - Its flux per pole
  - Resistance of armature circuit
  - Applied voltage
  - 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. Derive an expression for mechanical force developed by magnetic field. (8)
12. Explain with a neat sketch, the construction of a dc machine. (8)
13. Sketch and explain the speed-current, speed-torque and torque-current characteristics of a shunt motor, series motor and compound motor. (8)
14. Draw the no-load phasor diagram of a transformer and explain. (8)
15. Explain any two methods of testing of DC machines. (8)