

619

October 2016

Time - Three hours  
(Maximum Marks: 75)

- [N.B: (1) Answer any FIVE questions in each PART - A and PART - B.  
Q.No. 8 in PART - A and Q.No. 16 in PART - B are compulsory.  
(2) Answer division (a) or division (b) of each question in PART - C.  
(3) Each question carries 2 marks in PART - A, 3 marks in Part - B  
and 10 marks in PART - C.]*

PART - A

1. State Faraday's laws.
2. Mention any two causes of failure to build up voltage in DC generator.
3. State Fleming's left hand rule.
4. Write any two applications of DC series and DC shunt motor.
5. Write the emf equation and voltage ratio for 1-phase transformer.
6. Draw the 3-phase transformer with delta-star connections.
7. Draw the constant voltage method of charging of battery.
8. Draw the phasor diagram on no-load condition for 1-phase transformer.

PART - B

9. Discuss about the types of DC generator.
10. Write about any one method of compensating armature reaction.
11. Brief the principle of operation of DC motor.
12. Write short notes on back emf in DC motor.
13. Mention regulation, efficiency and condition for maximum efficiency in 1-phase transformer.
14. List out any three conditions for parallel operation of 3-phase transformer.
15. Discuss about the indication of fully charged battery.

[Turn over.....

16. The maximum flux density in the core of a 240/2880V, 50Hz, 1-phase transformer is  $1.4 \text{ Wb/m}^2$ . If the number of turns in primary is 24, determine the area of core.

PART - C

17. (a) Explain about the construction of DC generator.

(Or)

- (b) What is commutation? Explain about any two methods of improving commutation.

18. (a) Explain about any two methods of speed control of DC shunt motor.

(Or)

- (b) Explain about the operation of 3-point starter.

19. (a) Explain about the construction and operation of 1-phase transformer.

(Or)

- (b) Discuss in detail about the determination of equivalent circuit constants in transformer.

20. (a) Explain about any two methods of cooling in transformer.

(Or)

- (b) Write about the operation of Bucholz relay.

21. (a) Explain about the construction of lead acid battery.

(Or)

- (b) Explain about the chemical action of nickel-iron cell during discharging and charging.