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Ref No. : Ex/EE/T/313/2017(OLD)

Bachelor of Electrical Engineering,3rd Year 1st Semester Supple Examination,2017(OLD)

SUBJECT : ELECTRICAL MACHINES-II (OLD)

Time: Three Hours

Full Marks: 100 (50 each part)

Use a separate Answer-Script for each part

PART - I

Question No.		Marks
	Answer Question No.1 and any two from the rest.	
1.		
i)	Wave connected D.C. machines require equalizer connection-Justify.	6x3
ii)	Due to armature reaction the magnetic neutral axis shifted in the direction of rotation for a D.C. generator - Justify.	
iii)	D.C. series motor should not be operated under no-load condition-Justify.	
iv)	For high current and low voltage D.C. machines, lap connection is preferred-Explain.	
v)	D.C. shunt generator has poor voltage regulation than the separately exited D.C. generator-Explain.	
vi)	Swinburnes method of testing of D.C. machines can not be performed on D.C. series motor-Explain.	
2.		
(i)	What are the effects of armature reaction in D.C. machines and what are the methods of reducing it ?	8
(ii)	Explain why we do not get the linear commutation in real life. Explain how interpole helps to achieve linear commutation.	8
3.		
(i)	Derive the torque-current characteristics of D.C. series motor.	8
(ii)	A 100 KW, belt driven shunt generator running at 300 rpm at 220 V bus-bars continues to run as a motor when the belt breaks, taking 10 KW. What will be its speed? Armature resistance of the machine is 0.025 ohm and the field resistance is 60 ohms. Contact drop under each brush is 1V.	8

4

(i) Explain the external characteristics of D.C. compound generator. Explain why differentially compound D.C. generator is used in welding application. **8**

(ii) A direct current machine generates 250V on open circuit at 1000 rpm. Armature resistance, including brushes is 0.5 ohm and the field resistance is 250 ohms. The input to the machine running as a motor on no-load is 4A at 250 V. Calculate the speed of the machine. **8**

5.

(i) Discuss in brief the different methods of speed control of D.C. motors. **12**

(ii) What will happen if the field circuit becomes open during running condition of a D.C. shunt motor? **4**

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BACHELOR OF ELECTRICAL ENGINEERING EXAMINATION,2017(Old)

(3-RD YEAR 1-ST SEMESTER supple)

ELECTRICAL MACHINE -II

Time:3 hours Full Marks:100

(50 marks for each part)

Use separate Answer-script for each part

PART-II

Answer any three questions. Two marks for neatness. All symbols have their usual significance

1. Describe transformer vector group for the following transformers:
i) Dd0, ii) Yz11 iii) Dy1 and iv) Dz0. 4×4=16

2. a) Show how **Dy11** and **Yd1** transformers can be connected in parallel successfully.
b) Two-single phase furnaces A & B are supplied at 400V by means of a Scott-connected transformer with input voltage of 3-phase,6.6kV,50Hz.Furnace-A, teaser one, takes 400kW at 0.8 power factor lagging and furnace-B takes 500kW at power factor 0.8 leading. Compute line currents in 3-phase sides and draw the phasors. 8+8=16

3. a) Show how 3-rd harmonics flux is produced in a transformer.
b) What is neutral oscillation in 3-phase transformers?
c) Explain method of 3-rd harmonics decrease by delta winding in 3-phase transformer. 6+5+5=16

4. a) What are the different types of Tap-Changer?
Explain why taps of Tap-Changer are connected in the high voltage side of a transformer?
b) Describe the operation of a centre-tap reactor on-load tap-changer. 8+8=16

5. a) Describe full wave and chopped wave impulse tests on a transformer and how faults are detected by these tests.
b) Discuss the various over-voltages distributions across the transformer windings considering a suitable model for it. 8+8=16

6. Write short notes on: 8+8=16
a) Comparison of performances between dc series motor and a single-phase ac series motor.
b) Commutation problems and its remedy in a single-phase ac series motor.