

Total No. of Questions—8]

[Total No. of Printed Pages—3

Seat No.	
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S.E. (Electrical) (II Sem.) EXAMINATION, 2016

ELECTRICAL MACHINES—I

(2012 PATTERN)

Time : Two Hours

Maximum Marks : 50

- N.B. :—** (i) Figures to the right indicate full marks.
(ii) Neat diagrams must be drawn wherever necessary.
(iii) Use of non-programmable scientific calculator is allowed.
(iv) Use suitable data if necessary.

1. (a) O.C. and S.C. test has been conducted on 200/400 V, 1-ph transformer : [7]
O.C. Test : 200V, 0.8A, 80W on L.V. side
S.C. Test : 15V, 10A, 100W on H.V. side
Calculate :
(i) No load current components.
(ii) Equivalent resistance and reactance referred on primary (L.V.) side.
- (b) With neat connection diagram, explain the procedure to conduct polarity test on 1-ph transformer. [6]

Or

2. (a) Explain V-V connection and obtain the relation between V-V capacity to delta-delta capacity. Also state advantages and disadvantages of this connection. [7]

P.T.O.

- (b) Sketch and explain phasor diagram of transformer on load at : [6]
(i) lagging p.f.
(ii) leading p.f.
3. (a) Explain the speed control of d.c. series motor by various flux control methods. [6]
(b) A 9 kW, 200 V, 4 pole dc series motor with 800 wave connected conductors draws a current of 50 A. The flux per pole is 25 mWb and armature circuit resistance is 0.5 Ω . Calculate : [6]
(i) arm torque
(ii) shaft torque.

Or

4. (a) Obtain the emf equation of d.c. generator. [6]
(b) What is commutation ? What are the causes of bad commutation ? Explain remedial measures on it. [6]
5. (a) Compare squirrel cage rotor and wound rotor. [6]
(b) A 3-ph, 8-pole, 50 Hz induction motor runs at 720 rpm at full load. The rotor resistance per phase is 0.01 Ω and standstill reactance/ph is 0.1 Ω . Calculate : [6]
(i) ratio of max. torque to full load torque
(ii) speed at T_{\max} .

Or

6. (a) Obtain the torque equation of 3-ph induction motor at running condition. [6]

- (b) Obtain the relationship between rotor Cu loss and rotor gross output in terms of slip of 3-ph induction motor. [6]
7. (a) With neat connection diagrams, explain the procedure to conduct no load test and blocked rotor test on 3-ph induction motor. [6]
- (b) Draw the circle diagrams, showing all the quantities and explain the procedure how to draw it. [7]

Or

8. (a) What is the necessity of starter for 3-ph induction motor ? Explain star-delta starter. [7]
- (b) Explain the testing of 3-ph induction motor by I.S.-325. [6]