Total No. of Questions : 10]

SEAT No. :

P3368

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TE. (Electrical)

ELECTRICAL MACHINES - II

(2015 Pattern) (End Semester)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q4, Q.5 or Q.6, Q.7 or Q8, Q.9 or Q10.***
2) ***Neat Diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Use of electronic pocket calculator is allowed.***
5) ***Assume suitable data, if necessary.***

Q1) a) Explain advantages of Rotating field type system over rotating armature system in case of synchronous generator. **[4]**

b) A 4 pole, 50 Hz star connected alternater has flux per pole of 0.12 wb. It has 4 slots per pole per phase. The conductors per slot are 4. If the winding coil span is 150°. Calculate phase value of induced emf. **[6]**

OR

Q2) a) Draw per phase equivalent circuit of alternater and mark all parameters in it. **[2]**

b) Slip test is conducted on 3 KVA, 415V, 3 phase star connected alternater. Calculate voltage regulation of alternater at full load 0.8 p.f. lag. The observation table is as given below. Take Ra = $5\Omega/p^h$ **[8]**

V_{min} (line)	V_{max} (line)	I_{max}	I_{min}
39.9V	44.3V	1.1A	0.8A

Q3) a) Write a short note on 'synchroscope' **[4]**

b) With neat diagram, explain working of 3 phase synchronous Induction motor. **[6]**

OR

P.T.O.

Q4) a) Draw V curve and A curve of 3 phase synchronous motor. **[2]**

b) The o.c. & s.c. test results of a 3 phase, 3kvA, 415V, 4.2 amp star connected alternater are given below **[8]**

O.C. Test results

If (A)	0	0.1	0.14	0.2	0.23	0.28	0.36	0.44	0.58	0.67
Voc(l) volts	0	120	160	200	240	280	320	360	400	420

S.C. Test Results

If (A)	0.08	0.12	0.18	0.23	0.28	0.32	0.37	0.4
I_a sc (A)	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.2

Using must method calculate voltage regulation of alternater at full lead 0.8 pf lead.

Q5) a) Explain the operation of 3 phase Induction motor as induction generator. State advantages of induction generator. **[8]**

b) With neat diagram explain Construction & working of linear Induction motor. **[8]**

OR

Q6) a) Write a short note on 'Energy efficient 3 phase Induction motors. **[8]**

b) State different methods of controlling speed of 3 phase Induction motor. With neat diagram explain roter resistance control. Draw its speed torque characteristics for different values of roter resistances. **[8]**

Q7) a) Explain how unidirectional torque is produced when d.c. series motor is connected to A.C. supply. What are the problems associated with a.c.operation. **[8]**

b) With neat diagram explain **[8]**

i) Conductively compensated series motor

ii) Inductively compensated series motor

OR

Q8) a) A blocked roter test is conducted on single phase 50Hz, 230V, 6.2 A 6000 rpm series motor. The test results are as below.

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Vsc	Isc	Wsc
130V	4 A	160 w

Taking voltage scale of lcm = 20V Draw circle diagram. Determine full load efficiency? Full load power factor **[10]**

b) Explain modifications necessary in the construction of d.c series motor to operate it satisfactorily on a.c. supply. **[6]**

Q9) a) With neat diagram explain the construction & working of capacitor start Induction motor. Draw the phase diagram &torque speed characterstics of this motor. **[10]**

b) Explain double revolving field theory in case of single phase induction motor. Hence draw its torque-speed characteristics. **[8]**

OR

Q10)a) A 220 v, 50 Hz single phase induction motor has following parameters. **[10]**

R_1= 11.4Ω, R_2^1= 13.8Ω, X_1=14.3Ω

X_2^1=14.3, X_m=275Ω R_m=0Ω

Calculate current, power factor, input power, efficiency Given-friction & windage losses =30.2 watts

b) With neat diagram explain construction &working of shaded pole Induction motor . **[8]**

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