

Code No: P18EET03

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HALL TICKET NUMBER

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PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE  
(AUTONOMOUS)

II B.TECH I SEMESTER END SUPPLEMENTARY EXAMINATIONS, MARCH/APRIL - 2023  
ELECTRICAL MACHINES - I  
(EEE Branch)

Time: 3 hours

Max. Marks: 60

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A

Answer all the questions in Part-A (5X2=10M)

Q.No.	Questions	Marks	CO	KL
1	a) What are the factors involved in voltage buildup of shunt generator?	[2M]	1	1
	b) Why it is necessary to keep the brake applied tight while applying the brake test to a dc series motor	[2M]	2	1
	c) Why the transformer rating given in KVA?	[2M]	3	1
	d) What are the conditions for parallel operation of two single phase transformers?	[2M]	4	1
	e) What is the use of tertiary winding in three phase transformer?	[2M]	5	2

PART-B

Answer One Question from each UNIT (5X10=50M)

Q.No.	Questions	Marks	CO	KL
<u>UNIT-I</u>				
2.	a) Explain singly excited and multi excited electromechanical energy conversion devices with suitable examples.	[5M]	1	2
	b) What is critical field resistance? Explain the experimental procedure to determine the critical field resistance from magnetic characteristics of dc generators?	[5M]	1	2
<u>OR</u>				
3.	a) Explain how the back emf of a dc motor causes the development of mechanical power.	[5M]	1	3
	b) The armature of a dc separately excited machine has a resistance of 0.15 ohm and is connected to a 230V supply. calculate the generated emf when it is running (i) as generator giving 60A (ii) as motor taking 80A	[5M]	1	3
<u>UNIT-II</u>				
4.	a) A DC shunt motor is connected a three point starter .Explain what will happen if the starter handle axis moved rapidly from OFF to ON position.	[5M]	2	2
	b) What are the different methods of speed Control of a dc motor? Explain any one with its merits and demerits.	[5M]	2	2
<u>OR</u>				
5.	a) Explain the various losses that occur in the dc machine.	[4M]	2	2
	b) In a brake test on a dc shunt motor , the effective diameter of the pulley was 48cm, speed 1420 rpm, the armature current is 22.5 A, when the supply is 220V. Estimate the efficiency of the motor at this load when the field resistance is 110 ohm.	[6M]	2	3
<u>UNIT-III</u>				
6.	a) Does the transformer draws current when it is on load condition. Why?	[5M]	3	2
	b) A single Phase transformer with turns ratio of 440V/110V takes on load current of 5A at 0.2 lagging. If the secondary supplies a current of 120A at 0.8 pf lagging. Calculate the current drawn by the primary.	[5M]	3	3

OR													
7.		Calculate the all day efficiency of A 5KVA , single phase transformer which has a core loss of 40 W and full load copper loss of 100 W. the daily variations of the load on transformer is as follows .	[10M]	3	3								
		<table border="1"> <tbody> <tr> <td>7AM To 1PM</td> <td>3 KW at 0.6 p.f</td> </tr> <tr> <td>1PM to 6 PM</td> <td>2 KW at 0.8 p.f</td> </tr> <tr> <td>6 PM to 1AM</td> <td>6 KW at 0.9 p.f</td> </tr> <tr> <td>1 AM to 7AM</td> <td>No load</td> </tr> </tbody> </table>	7AM To 1PM	3 KW at 0.6 p.f	1PM to 6 PM	2 KW at 0.8 p.f	6 PM to 1AM	6 KW at 0.9 p.f	1 AM to 7AM	No load			
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UNIT-IV													
8.		Explain the procedure to conduct the Sumpner's test and obtain the different circuit parameters to estimate the performance of the transformer.	[10M]	4	2								
OR													
9.	a)	Explain the essential and desirable conditions which would be satisfied before two single-phase transformers may be operated in parallel	[5M]	4	2								
	b)	What is auto-transformer? Compare auto-transformer with two winding transformer?	[5M]	4	3								
UNIT-V													
10.		Discuss Scott connection of transformers for phase conversion and mention its applications.	[10M]	5	2								
OR													
11.		Why are tappings provided in transformers? Explain with the help of connection diagrams the operation of off-load tap changer.	[10M]	5	2								

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