

"Please check whether you have got the right question paper."

- i) *Q. 1 & Q. 6 are compulsory.*
- ii) *Attempt any two questions from remaining questions of each section.*
- iii) *Assume suitable data wherever necessary*

SECTION-A

Q.1	Attempt <u>any five</u>	10
	<ul style="list-style-type: none"> a) Enlist different design circuits & Electrical machines. b) What is the signification of standardization and specification in Electrical machine design. c) What do you mean by gap contraction faster? d) Why it is difficult to calculate mmf for air gap of a slotted machines. e) What is the significance of carter's coefficient in Electrical machine design? f) What are the advantages of semi enclosed slots provided in a stator of induction motor? g) Explain the significance of output coefficient in rotating machine. h) What do you mean by magnetic leakage and fringing? 	
Q.2	<ul style="list-style-type: none"> a) What do you mean by real and apparent flux density ? Derive the relation between them b) Calculate the m m f required for the airgap of machine having core length 0.32M including 4 ducts & 10 mm each , pole are =0.19M . slot pitch 65.4 MM slot opening 5 MM , airgap length 5 MM Flux per pole 52 mwB . Given carters coefficient is 0.18 for opening /gap =1& 0.28 opening /gap =2 	07 08
Q.3	<ul style="list-style-type: none"> a) Explain the various factors which gives choices of stator slots in 3 –ph induction motor . b) In the design of 30KN , 3ph ; 440V, 50hz delta connected induction motor. Assume the specific electric loading of 23000ac/m, specific mag loading of 0.45wb/m² full load efficiency 85 % & p.f 0.86winding factor 0.955. Estimate the stator core dimensions , no of slots and winding turns . 	07 08
Q.4	<ul style="list-style-type: none"> a) Explain the various factors that gives the .selection of rotor slots in 3- ph induction motor b) Estimate the main dimensions , air gap length no of stator slots ;turn per phase and cross sectional area of statorconductor for 3-ph , 20 Hp , 400 v, 6 pole , 50 HZ , 970rpm induction motor suitable for star/delta starting .Assume Bar = 0.45 wb/h² . ac =23000 ac/m full load efficiency 0.88 and pf=0.89. 	07 08
Q.5	Solve <u>any three</u>	15
	<ul style="list-style-type: none"> a) Choice of of air gap length in induction motor b) Different species of computer aided design of rotating machine . c) Design of ending of sq. cage induction motor . d) Calculations of m m f for iron Dath . e) Limitations in the design of Electrical machines 	

SECTION-B

Q.6

Attempt any five

- Define heating and cooling time constant .
- Give two comparisions of Distribution & power transformer .
- What is the significance of window space factor in transormer ?
- Enlist the various cooling methods of transformer .
- The ratio of full load magnetomotive force in 400 KVA , 50 Hz , 1 – phase transformer is 2.4×10^{-6} . Calculate value of constant K.
- Explain the advantages of stepped core used in transformer .
- En list the different types of winding prmided in transformer .
- Explin the causes of temp . rise intransfromer

Q.7

- a) Derive the output equation of 3-ph transforms .

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- b) A 3-ph , 50 Hz , oil cosled core type transformer Has following dimensions .

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Distance between core centres =0.2m

Hight of window =0.24 m

Dia of cirumscribing circle =0.14 m

 $BM=1.25wb/M^2$

$$\delta = 2.5 A / MM^2$$

Estmate the KVA rating .

Assume $KW =0.2$, $Ai =0.56d^2$ for 2 stepped core .

Q.8

- a) What is the significaree of constant K in transforoner ?Show that $Et =K\sqrt{KVA}$.

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- b) A 250 KVA, 200v/ 400 v ,50Hz ,1-phase core type power transformer with following data $Et =15v$; $Bm=1.25 wb/m^2$; $\delta = 2.75A / mm^2$, $Kw =0.3$, $\frac{Hw}{Ww} = 3$

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Determine the main dimensions & core and yoke .

Q.9

- a) Explain in detail various cooling methods prieded for cooling of different types transformer

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- b) Derive the expresion for calculation of total no of cooling tubes provided on transfrmer tank .

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Q.10

Attempt any three

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- Explain Evaluation of resistanc in transformer .
- Explain the chioce of max fulx density on & current density on design of transfrmer .
- Explain the conservator & breater with diagram .
- Explain the design of choke .
- Explain the Development of various force in trnsformer under short ckt condition .