(Time: 3Hours)   MAX MARKS 80

NOTE
    1.Question number 1 is compulsory
    2.Attempt any three from the remaining
    3.Figures to right indicates full marks
    4.Assume suitable data if necessary and mention the same

1.		Attempt any four of the following :-	20
	a)	What is the objective of performing no load and blocked rotor test on 3 phase induction motor?	05
	b)	Explain capacitor start 1-phase single phase Induction motor.	05
	c)	Explain dispersion coefficient.	05
	d)	What is the significance of magnetic loading?	05
	e)	Why do we need to apply reduced voltage at the time of starting of 3- phase Induction motor?	05
2.			20
	a)	Explain the effect of frequency and voltage variation on Induction Motor performance.	10
	b)	A 3 phase, 6 poles, star connected, Induction motor connected to 415V, 50 Hz supply has the rotor resistance and standstill reactance are 0.12 and 0.85 ohms per phase. The stator to rotor turns ratio is 1.8 and full load slip is 4%. Calculate the full load torque, maximum torque and the speed at maximum torque.	10
3.			20
	a)	Derive the output equation of a 3-phase Induction motor in terms of main dimensions.	10
	b)	Discuss the concept of Carter's coefficient in detail	10
4.			20
	a)	What is frame and frame size in case of Induction motor? Draw a figure showing structural dimensions of standard frame?	10
	b)	Determine the main dimension, turns per phase, no. of slots, conductor cross section and area of slot for a 3-phase, 50Hz, 4 pole, 250HP, 400V,1410rpm, delta connected squirrel cage induction motor with the data given: average flux density in air gap = $0.5Wb/m^2$, ampere conductor per meter = 30,000A/m, efficiency =90%, pf = 0.9, winding factor = 0.955, current density = 3.5 A/mm^2 , slot space factor = 0.4, ratio of length of core to pole pitch = 1.2.Assume 5 slots per pole per phase. Assume three phase fault	10

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5.   20

    a)   Derive Equivalent circuit diagram of 3–Φ induction motor.   10

    b)   A 15kW,440V , 4pole 50Hz, 3–Φ, star connected induction motor gave   10
               following test results :

	Line Voltage	Line current	Power input
No load Test	440V	10A	1310W
Blocked rotor test	200V	50A	7100W

Assume stator and rotor ohmic losses equal at standstill. Draw the circle diagram.

6.   Write short notes on (any two)   20
    a)   Double field revolving theory   10
    b)   Cogging and crawling in 3 –Φ induction motor.   10
    c)   Reluctance starting in 1- phase Induction motor.   10

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