Duration 3 hours   Total Marks: 80

Note: 1) Question no **1** is compulsory

2) Solve any **three** questions from remaining questions

3) Assume suitable data if required and mentioned it

4) Figure to the right indicates full marks

Q.1   Solve **any four**   20

a) What is the difference between a generator and a motor?

b) Explain power flow diagram for an Induction Motor

c) State the advantages and disadvantages of moving iron instrument.

d) Explain the applications of CRO

e) Explain the basic principle of ADC.

Q.2   a) Two series motors run at a speed of 700 r.p.m. and 750 r.p.m respectively,   10
when taking 70A at 500 V. The terminal resistance of each motor is 0.5Ω.
Calculate the speed of the combination when connected in series and coupled
mechanically. The combination is taking 70A at 500V supply.

b) Derive the following torque ratios in terms of slip and rotor parameters.

i) $\dfrac{T_{st}}{T_m}$ ii) $\dfrac{T_{FL}}{T_m}$ 10

Q.3   a) Explain how rotating magnetic field is produced in 3ϕ induction motor.   10

b) Explain the working of attraction type and repulsion type moving iron
Instrument with neat diagram   10

Q. 4) a) Derive the bridge balance equation for the basic a.c. bridge   10

b) What is Hay's bridge? Derive the balance equation. When it is preferred
over Maxwell bridge?   10

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Q. 5)   (a) A 3Φ, 12 pole, induction motor has rotor resistance of 0.15Ω and standstill   **10**
reactance of 0.25Ω per phase . On full Load it is running at a speed of 480 r.p.m.
The rotor induced e.m.f. per phase at standstill is observed to be 32V. Calculate
i) Starting Torque ii) Full load torque iii) maximum Torque iv)Speed at maximum torque.

(b) Explain variable frequency drive. List its applications   **10**

Q.6)   Write short notes on (**any two**)   **20**
1) A. C. voltmeter
2) Shaded pole induction motor
3) Applications of a.c. potentiometer.

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