1) A 3 Phase, 50 Hz, Six pole induction motor has a rotor resistance of 0.1 Ω and reactance of 0.92 Ω. Neglect the voltage drop in stator and assume the rotor resistance is constant. Given that the full load slip is 3%, the ratio of maximum torque to full load torque is

(a) 1.567 (b) 1.712 (c) 1.948 (d) 2.134

2) An 8-pole, 3 phase, 50 Hz Induction motor is operating at a speed of 700 rpm. The frequency of the rotor current of the motor in Hz is ——.

3) A 400V, 15 KW, 4 pole, 50 Hz, Y connected induction motor has full load slip of 4%. The output torque of the machine at full load is

(a) 1.66 Nm (b) 95.5 Nm (c) 99.47 Nm
(d) 624.73 Nm

4) A three phase cage induction motor is started by direct-on-line (DOL) switching at the rated voltage. If the starting current drawn is 6 times the full load current, and the full load slip is 4%, the radio of the starting developed torque to the full load torque is approximately equal to

(a) 0.24 (b) 1.44 (c) 2.40 (d) 6.00

5) A 400 V, 3-ϕ, Star connected Induction motor has a stator impedance of $(0.06 + j0.2)\ \Omega$ and an equivalent rotor impedance of $(0.06 + j0.22)\ \Omega$. Neglecting exciting current. Find the maximum gross power and the slip at which it occurs.

6) A balanced three phase induction motor has an efficiency of 0.85 when its output is 44.76 KW. At this load both stator copper loss and the rotor copper loss are equal to the core losses. The mechanical losses are one-fourth of the no-load loss. Calculate the slip.

7) An Induction motor is running at 50% of the synchronous speed with useful output of 41.03 KW and the mechanical losses total 1.492 KW. Estimate the Cu loss in the rotor circuit of the motor. If the stator losses total 3.5 KW at what efficiency is the motor working?

8) The rotor of an 8-pole, 50 HZ, 3 phase IM has a resistance of $0.2\ \Omega$/phase and runs at 720 rpm. If the load torque remains unchanged. Calculate the additional rotor resistance that will reduce this speed by 10%.

1) Q) A wound rotor Induction motor runs with a slip of 0.03 when developing full load torque. Its rotor resistance is 0.25 ohm Per phase. If an external resistance of 0.5 ohm per phase is connected across slip rings. what is the slip for full load torque

(a) 0.03 (b) 0.06 (c) 0.09 (d) 0.1

2) Q) The rotor of a 4 pole, 50 Hz, slip ring induction motor has a resistance of 0.25 Ω/Phase and runs at 1440 rpm at full load. The external resistance per phase which must be added to lower the speed to 1200 rpm, the torque being constant, is ____ (b) ____ ohm.

3) A 3-ϕ IM has a full load slip of 3% at normal voltage. which one of the following will be the value of the slip of the motor if it develops the same torque theoretically while operating at 110% of its normal voltage?

(a) 2.48 %. (b) 0.248%. (C) 0.483%. (d) 4.83%.

4) A 440V, 50 HZ, squirrel cage induction motor has a ratio of standstill reactance to resistance of rotor per phase of 3 to 1 and a maximum torque which is 4 times the normal full load torque. The minimum line voltage required to develop the normal full load torque at starting is ___ V.

5) Q) Under no load condition, if the applied voltage to an induction motor is reduced from the rated voltage to half the rated value.

(a) the speed decreases and the stator current increases

(b) Both the speed and stator current decrease

(c) The speed and the stator current remain Practically Constant

(d) There is a negligible change in the speed but the stator current decreases.

6) Q) If a 400 V, 50 HZ star connected, 3 phase squirrel cage induction motor is operated from a 400 V, 75 HZ supply, the torque that the motor ~~motor~~ can now provide while drawing rated current from the supply?

(a) Reduces

(b) increases

(c) Remains the same

(d) increase or reduces depending upon the rotor resistance

7) Q) The speed of a 4 pole induction motor is controlled by varying the supply frequency while maintaining the ratio of supply voltage to supply frequency $\frac{V}{f}$ Constant At rated frequency of 50 Hz and rated voltage of 400 V it's speed is 1440 rpm. Find the speed at 30 Hz, if the load torque is constant

(a) 882 rpm (B) 864 rpm (C) 840 rpm (d) 828 rpm

8) Q) An ac induction motor is used for a speed control application. It is driven from an inverter with a constant V/f control. The motor name plate details are as follows

V : 415 V Ph : 3
f : 50 Hz N : 2850 rpm

The motor is runing with the inverter output frequency set at 40 Hz, and with half the rated slip, the running speed of the motor is

(a) 2400 rpm (b) 2280 rpm (C) 2340 rpm (d) 2790 rpm

9) Q) A 3-ϕ, 1455 rpm induction motor drives load requiring constant torque. In the linear torque slip range, if supply voltage drops to 90%. find the %. Change in motor speed and ohmic losses.

1) The following data pertains to a 230V, 50 Hz capacitor start single phase induction motor at stand still. Main winding excited alone : 100V, 2A, 40W.

Auxillary winding excited alone : 80V, 1A, 50W

(i) Determine the value of capacitance (in μF) for obtaining the maximum starting torque.

(ii) Compute the value of starting capacitance (in μF) so that main and auxillary winding currents are in quadrature at the time of start.

2) A 375W, 230V, 50Hz, capacitor start single-phase induction motor has the following constants for the main and auxillary windings (at starting):

$Z_m = (12.5 + j15.75)\ \Omega$ (main winding)

$Z_A = (24.5 + j12.75)\ \Omega$ (auxillary winding)

Neglecting the magnetizing branch, the value of capacitance (in μF) to be added in series with the auxiliary winding to obtain Maximum torque at starting is _____.

3) A 230V, 50 HZ, 4 pole, single phase induction motor is rotating in the clock wise (forward) direction at a speed of 1425 Rpm. If the rotor resistance at stand still is 7.8Ω, then the effective rotor resistance in the backword branch of the equivalent circuit will be

(a) 2Ω, (b) 4Ω (c) 78Ω (d) 156Ω

4) The main and auxiliary winding impedance of a 50 HZ, capacitor start single phase induction motor are:

$$Z_m = 3+j2.7, \quad Z_a = 7+j3$$

Determine the value of the capacitor to be connected in series with the auxiliary winding to achieve a Phase difference of $\alpha = 90^\circ$ between the currents of the two winding at start

(a) 276 μF (b) 296 μF (c) 316 μF

(d) 336 μF