Registration No :

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B.Tech
PEEL5303

6th Semester Back Examination 2018-19
ELECTRIC DRIVES
BRANCH : EEE
Time : 3 Hours
Max Marks : 70
Q.CODE : F962
Answer Question No.1 which is compulsory and any FIVE from the rest.
The figures in the right hand margin indicate marks.

Q1   **Answer the following questions :**   **(2 x 10)**
   a) Why 3 phase Induction motors are not used in electric traction?
   b) How the selection of motor can be done?
   c) Define steady state stability of an electric drive?
   d) State the use of flywheels?
   e) Write the advantages of group drives?
   f) Write the expression for tractive effort of the driving wheel?
   g) Define coefficient of adhesion and accelerating weight?
   h) Write the expression for energy output from the driving Axle?
   i) Write the drawback of supply voltage control method?
   j) Draw the block diagram of current regulated voltage source inverter control?

Q2 **a)** Discuss the regenerative braking applied to DC shunt motor and induction motor?   **(5)**
   b) An electric motor has load variation as given below: Torque 240Nm for   **(5)**
         20minutes, 140 Nm for 10minutes, 300Nm for 10minutes, 200Nm for 20minutes.
         If the speed of the motor is 720rpm. Find the power rating of motor?

Q3 **a)** Discuss the Rotor resistance control method of three phase induction motor with   **(5)**
         complete diagram?
   b) Write a short note on Slip speed control of induction motor?   **(5)**

Q4 **a)** A 400V, 4 poles, 50Hz induction motor develops 25 hp at 4% slip on full load. If   **(5)**
         the ratio of rotor resistance to standstill reactance is 1:4, estimate in kg-m the
         initial plugging torque and the torque at standstill.
   b) Describe with complete diagram and explain static Kramer's drive?   **(5)**

Q5 **a)** Derive the expression for maximum speed in km/hr using simplified quadrilateral   **(5)**
         speed time curve?
   b) The peripheral speed of a railway motor cannot be allowed to exceed 45 meters   **(5)**
         per second. If the gear ratio is 16/73, the armature diameter 40 cm and the wheel
         diameter 90cm. What is the limiting speed of the train?

Q6 A 30kw, 400 V , 3 phase , 4 pole, 50Hz induction motor has full load slip of 5 %. If the ratio of standstill reactance to resistance per phase of rotor is 4. Estimate the plugging torque at full load speed. **(10)**

Q7 A 3 phase, 440V, 50Hz , 6 pole ,Y connected induction motor has following parameters referred to stator: Rs=0.5 ohm, Rr=0.6ohm,Xs=Xr=1 ohm. Stator to rotor turns ratio is 2. If the motor is used for regenerative breaking determines maximum overhauling torque it can hold and the range of speed in which it can safely operate? **(10)**

Q8 **Write short answer on any TWO :** **(5 x 2)**
   a) microprocessor based drive
   b) Textile mills
   c) static Scherbius drive