| | ADAMAS UNIVERSITY<br>**END-SEMESTER EXAMINATION :  JANUARY 2021**<br>(Academic Session: 2020 – 21) | | |
|---|---|---|---|
| **Name of the Program:**<br>(Example: B. Sc./BBA/MA/B.Tech.) | B.Tech | **Semester:**<br>(I/III/ V/ VII/IX) | VIII |
| **Paper Title :** | Electric Drives | **Paper Code:** | EEE44112 |
| **Maximum Marks :** | 40 | **Time duration:** | 3 hours |
| **Total No of questions:** | 8 | **Total No of Pages:** | 2 |
| *(Any other information for the student may be mentioned here)* | Any missing or misprinted information may be suitable assumed | | |

*Answer all the Groups*
**Group A**
Answer all the questions of the following                $5 \times 1 = 5$

**1.**   **a)** Define electric drives?                                                                    [CO1]

**b)** Write down the heat balance equation.                                      [CO2]

**c)** Define heating time constant?                                                    [CO2]

**d)** What is meant by plugging?                                                        [CO3]

**e)** What do you mean by slip?                                                          [CO3]

**GROUP –B**
Answer *any three* of the following                $3 \times 5 = 15$

**2.**   Mention the functions of Power modulators.                                  [CO1]

**3.**   Explain the factors governing the selection of motors.                  [CO3]

**4.**   Write a brief note on classes of duty for an electric motor in an electric drive.   [CO2]

**5.**   Compare the D.C and A.C drives.                                                  [CO2]

**6.** A 220 V, 1500 rpm, 11.6 A separately excited motor is controlled by a l-phase fully-controlled rectifier with an ac source voltage of 230 V, 50 Hz. Enough filter inductance is added to ensure continuous conduction for any torque greater than 25 percent of rated torque, Ra = 2 ohm

   i) What should be the value of the firing angle to get the rated torque at 1000 rpm?

   ii) Ca1culate the firing angle for the rated braking torque and - 1500 rpm. [5+5]

   [CO1]

**7.** Explain how the speed of a DC Shunt Motor can be varied both above and below the speed at which it runs with full field current. [CO2]

**8.** A 230 Volt, 960 rpm and 200A separately excited dc motor has an armature resistance of 0.02Ω. The motor is fed from a chopper which provides both motoring and braking operations. The source has a voltage of 230 Volt. Assume continuous conduction.

   (i) Calculate duty ratio of the chopper for motoring operation at rated torque and 350rpm.

   (ii) Calculate duty ratio of the chopper for braking operation at rated torque and 350rpm.

   (iii) If maximum duty ratio of the chopper is limited to 0.95 and maximum permissible motor current is twice the rated, calculate maximum permissible motor speed obtainable without field weakening and power fed to source.

   [3+3+4]
   [CO3]

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