**14EE801**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular\Supplementary) DEGREE EXAMINATION** | | | |
| **July, 2021** | **Electrical and Electronics Engineering** | | |
| **Eight Semester** | **Industrial Drives** | | |
| **Time:** Three Hours | | **Maximum:** 60 Marks | |
| *Answer ALL Questions from PART-A.* | | | (1X12 = 12 Marks) | |
| *Answer* ***ANY FOUR*** *questions from PART-B.* | | | (4X12=48 Marks) | |
| Part - A | | | | |

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| 1. | Answer all questions | | (1X12=12 Marks) | |
|  | a) | List out the main parts of electric Drive. | |  |
|  | b) | Draw the speed –torque curves with sign conventions in electric drives. | |  |
|  | c) | Write the load torque equations pertaining to electric drive. | |  |
|  | d) | Explain the relations between the parameters of DC motor. | |  |
|  | e) | What is braking? | |  |
|  | f) | Draw the Speed- torque Characteristics of a DC shunt motor. | |  |
|  | g) | Compare VSI & CSI fed drives. | |  |
|  | h) | Why V/F ratio must be maintained constant in induction motors? | |  |
|  | i) | Define slip speed. | |  |
|  | j) | What are the starting methods of synchronous motor? | |  |
|  | k) | Write applications of BLDC motor. | |  |
|  | l) | What is vector control? | |  |
| **Part – B** | | | | |
| 2. | a) | Explain multiquadrant operation of electric drive. | | 6M |
|  | b) | Explain the modes of operation of electric drive | | 6M |
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| 3. | a) | A drive has following parameters.  J=20 Kg-m2, T=100 ─ 0.2N, N-m, passive load torque Tl=0.08N, N-m Where N is speed in rpm.Initially the drive is operating in steady state. Now it is to be reversed. For this motor characteristic is changed to T= ─ 100 ─ 0.2N. Calculate the time of reversal. | | 6M |
|  | b) | Explain the parts of electric drive in detail. | | 6M |
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| 4. | a) | Explain the operation of a separately excited dc motor supplied from 1-Φ Half controlled rectifier. Assume Continuous conduction. | | 6M |
|  | b) | Explain the operation of a dc series motor supplied from 3-Φ fully controlled rectifier. | | 6M |
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| 5. | a) | A 220 V,150A, 800 rpm dc separately excited motor has an armature resistance of 0.08Ω. The motor armature is fed from a variable voltage source with an internal resistance of 0.02 Ω. Calculate internal voltage of the variable voltage source when the motor is operating in regenerative braking at twice the rated motor torque and 500rpm. | | 6M |
|  | b) | Explain with circuit and waveforms of first quadrant chopper fed DC series motor. | | 6M |
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| 6. | a) | Explain stator voltage control of induction motor. | | 6M |
|  | b) | Explain starting and braking of induction motor. | | 6M |
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| 7. | a) | Explain slip power recovery schemes of induction motor. | | 12M |
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| 8. | a) | Explain braking methods of synchronous motor. | | 6M |
|  | b) | Explain the operation of self controlled synchronous motor drive fed from load commutated inverter. | | 6M |
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| 9. | a) | Explain about the variable reluctance motor drives in detail. | | 6M |
|  | b) | Explain space vector modulation in detail. | | 6M |

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