A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 56301

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Sixth Semester

Electrical and Electronics Engineering

15UEE601- ADAVANCED ELECTRICAL AND CONTROL

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. In electrical drives the component which is used to modulate power from source to motor is CO1- R

   (a) Control unit (b) Control command (c) Power modulator (d) Sensing unit

2. The power modulator which is used to convert fixed DC voltage to variable DC voltage. CO1- R

   (a) Controlled rectifier (b) Un-controlled rectifier

   (c) Chopper (d) AC voltage controller

3. _____ drive is also called as Line shaft drive CO1- R

   (a) Individual drive (b) Group drive (c) Single drive (d)Multi motor drive

4. Full form of VVVF control CO2- R

   (a) Variable voltage VAR frequency. (b) Variable voltage variable frequency

   (c)Variable VAR voltage frequency. (d)VAR variable voltage frequency

5. The slip of an induction motor during DC rheostatic braking is CO2- R

   (a) 2-S (b) S (c) S-2 (d) 1-S

6. For an IM to operate in braking region slip should be always CO2- R

   (a) Less than zero (b) Greater than 1 (c) is equal to 1 (d) None of these

7. Speed control by variation of field flux results in CO2- R

(a) Constant power drive (b) Constant torque drive.

(c) Variable power drive (d) None of the above

8. Which type of Motor is best suited for the excavator? CO3- R

(a) DC Shunt Motor (b) Differential Motor (c) DC series Motor (d) Synchronous Motor

9. Switchable Speed drive, Open Loop speed drive, closed loop speed drives are the example of CO3- R

(a) Fixed speed Drive (b) Variable Speed drive (c) Servo Drive (d) Any of the above

10. _____is the simulation language. CO3- R

(a) GPSS (b) JAVA (c) Java script (d) None

PART – B (5 x 2= 10 Marks)

11. Draw the circuit diagram for single phase semi-converter fed Separately excited DC motor drive. CO1- R

12. Name some power modulators. Also list their functions. CO1- R

13. What is meant by stator voltage control? CO2- R

14. What are the three regions in the speed-torque characteristics in the IM? CO2- R

15. Mention the use of simulation software packages. CO3- R

PART – C (5 x 16= 80 Marks)

16. (a) Derive the fundamental torque equations governing DC Motor load dynamics. CO1- U (16)

Or

(b) Explain using a power circuit the working of a single phase full converter fed separately excited motor drive. CO1- U (16)

17. (a) Analyze the operation of 3φ fully controlled converter fed dc drive with neat waveforms for $\alpha=30^{o}$ and $\alpha=120^{o}$ and give the justification about the waveforms. CO1- App (16)

Or

(b) Explain in detail with an example, Multi-Quadrant operation of a motor drive with speed-torque plane. CO1- Ana (16)

18.	(a)	Explain the reason behind operating an induction motor with constant voltage and variable frequency. Draw the appropriate speed-torque characteristics.	CO2- Ana	(16)
		Or		
	(b)	Draw and explain the speed-torque characteristics of the induction motor.	CO2- Ana	(16)
19.	(a)	Design a circuit and explain the concept of closed loop control of 3-phase VSI fed induction motor.	CO2- U	(16)
		Or		
	(b)	Explain the speed control scheme employed in industries for induction motor drive with stator voltage control and mention the reason for choosing induction motor drive rather than other motor drives.	CO2- U	(16)
20.	(a)	Drive the transfer functions of DC motor drive and explain DC motor drive in detail.	CO3- U	(16)
		Or		
	(b)	Explain the operations of armature voltage control and field weakening control.	CO3- U	(16)

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