Hall Ticket Number :

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R-19

Code: 19A261T

III B.Tech. II Semester Regular Examinations July 2022

Microprocessors and Microcontrollers

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Demonstrate the architecture of 8086 Microprocessor.	8M	CO1	L2
	b)	Classify Instruction sets in 8086 Microprocessor with suitable examples.	6M	CO1	L1
		OR			
2.	a)	Explain the various general-purpose registers available in 8086 Microprocessor.	7M	CO1	L3
	b)	Illustrate the functional pin diagram of 8086 microprocessor.	7M	CO1	L2
		UNIT–II			
3.	a)	Differentiate between I/O mapped I/O and memory mapped I/O.	7M	CO2	L2
	b)	Draw PIN Diagram of Interrupt Controller.	7M	CO2	L2
		OR			
4.	a)	Demonstrate the architecture of 8257 DMA.	6M	CO2	L4
	b)	What are different transfer modes in DMA? Explain in brief.	8M	CO2	L2
		UNIT–III			
5.	a)	Give advantages and disadvantages of USART.	7M	CO3	L1
	b)	Describe RS232C to TTL conversion.	7M	CO3	L2
		OR			
6.	a)	What is need of communication interfaces in microprocessor and microcontroller devices?	7M	CO3	L1
	b)	Differentiate between Asynchronous and synchronous data transfer schemes.	7M	CO3	L3
		UNIT–IV			
7.	a)	Discuss the various data transfer and branching instructions available in 8051 controllers along with suitable examples.	9M	CO4	L6
	b)	Enlist features of Serial Communication in 8051 Microcontroller.	5M	CO4	L2
		OR			
8.	a)	Explain the timers available in 8051.	7M	CO4	L2
	b)	Draw and explain architecture of 8051.	7M	CO4	L2
		UNIT–V			
9.	a)	Explain the architecture of ARM processor.	6M	CO5	L2
	b)	Give Block diagram of ARDUINO with description.	8M	CO5	L2
		OR			
10.	a)	Write Short note on ADC System.	7M	CO5	L1
	b)	List and explain the registers available in user mode of an ARM device.	7M	CO5	L3

END

III B.Tech. II Semester Regular Examinations July 2022
Power System Operation and Control
(Electrical and Electronics Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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Marks

UNIT–I

1. a) Discuss about the cost curve and heat rate curve.   7M

   b) A constant load of 400MW is supplied by two 210 MW generators
      1 and 2, for which the fuel cost characteristics are given as below:
      $C_1 = 0.05PG_1^2 + 20PG_1 + 30$ Rs./hr
      $C_2 = 0.06PG_2^2 + 15PG_2 + 40$ Rs./hr
      The real power generations of units PG_1 and PG_2 are in MW.   7M
      Determine:
      (i) The most economical load sharing between the generators.
      (ii) The saving in Rs./day thereby obtain compared to the equal load
      sharing between two generators.

OR

2. a) Derive general transmission line loss formula and state assumptions
      made for calculating B- coefficients.   7M

   b) made for calculating B- coefficients.
      The fuel costs of two units are given by:
      $F_1 = 1.5 + 20PG_1 + 0.1PG_1^2$ Rs/h and $F_2 = 1.9 + 30PG_2 + 0.1PG_2^2$ Rs/h   7M
      PG_1, PG_2 are in MW. Find the optimal schedule neglecting the losses, when
      the total demand is 200 MW.

UNIT–II

3. Obtain the condition for economic generation of steam and hydro
   plants for short term scheduling. State the any assumptions are   14M
   considered.

OR

4. What is meant by unit commitment? Explain unit commitment solution
   techniques.   14M

UNIT–III

5. a) Draw the schematic diagram of speed governing system and explain
      the functions of various parts in it.   7M

   b) Explain the turbine model and hence discuss transfer functions of
      reheat and non – reheat models.   7M

OR

6. a) Derive transfer function of speed governing system. 7M

   b) Derive the transfer function of generator-load model 7M

UNIT–IV

7. a) Develop the block diagram model of uncontrolled two area load frequency control system and explain the salient features under static conditions. 7M

   b) Draw the block diagram of LFC control of single area and derive the dynamic response. 7M

OR

8. a) Describe the economic dispatch control with necessary diagram? 7M

   b) Write short notes on control area concept and area control error. 7M

UNIT–V

9. a) Compare the different types of compensating equipment used for transmission systems. 7M

   b) Explain Shunt and series compensation. 7M

OR

10. a) What is reactive power? Explain the generation and absorption of reactive power. 7M

    b) Write short notes on Inductor VAR compensators. 7M

END

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III B.Tech. II Semester Regular Examinations July 2022
Switch Gear and Protection
(Electrical and Electronics Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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		Marks	CO	Blooms Level

UNIT–I

1. A 220 kV system, the reactance and capacitance upto the location of circuit breaker is 8ohms and 0.025µF respectively. A resistance of 600 ohms is connected across the contacts of the circuit breaker. Determine the following i) Natural frequency of oscillation ii) Damped frequency of oscillation iii) Critical value of resistance which will give no transient oscillation iv) The value of resistance which will give damped frequency of oscillation, one fourth of the natural frequency of oscillation.   **14M   1   3**

OR

2. A circuit breaker is rated as2500A, 1500MVA, 33kV, 3s, 3-phase oil circuit breaker. Determine the rated symmetrical breaking current, rated making current, short time rating and rated service voltage?   **14M   1   3**

UNIT–II

3. The calculated short circuit current through a feeder is 1200 A. An over-current relay of rating 5A is connected for the protection of the feeder through a 1000/5 A CT. Calculate the operating time of the relay when it has a plug setting of 50% and time setting of 0.8. The characteristic of the relay is as follows:

PSM	1.3	2	4	6	10	20
Time (in seconds)	30	10	6.5	3.5	3	2.2

14M   2   3

OR

4. a) Discuss the advantages and disadvantages of microprocessor based relays.   **7M   2   2**

   b) Explain the operation of Microprocessor based over current relay?   **7M   2   2**

UNIT–III

5. a) What are the rotor faults in an alternator? For such faults give their causes and suggest protective measures?   7M   3   2

   b) Describe protection scheme of an alternator against inter-turn fault?   7M   3   2

OR

6.   A 3-phase, 33000/6600 V transformer is connected in star/delta and the protecting current transformer on the low voltage side have a ratio of 300/5. What will be the ratio of the current transformer on the high-voltage side?   14M   3   3

UNIT–IV

7. a) Describe the trip circuit diagram of 3-zone distance relay used for protection of a transmission line?   7M   4   2

   b) Explain the principle of time grading and current grading in a simple radial system equipped with IDMT over current relays for protection?   7M   4   2

OR

8.   Describe in detail the protection of parallel feeders and ring mains?   14M   4   2

UNIT–V

9. a) What is earthing? Discuss different types of earthing the neutral?   8M   5   2

   b) A 33kV, 3-phase, 50 Hz overhead line 60Km long has a capacitance to ground of each line equal to 0.015µF per km. Determine the inductance and KVA rating of the Peterson coil?   6M   5   3

OR

10. a) Discuss the operation of metal oxide lightning arrester?   7M   5   2

    b) What are the causes of over voltages in power systems?   7M   5   1

END

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Code: 19A26CT

III B.Tech. II Semester Regular Examinations July 2022
Utilization of Electrical Energy
(Electrical and Electronics Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Explain the Motor power rating for variable loads and write applications of electric drive?	7M	CO1	L1
	b)	Discuss about Temperature rise in Electric Drives?	7M	CO1	L1
		OR			
2.	a)	What is Electric Drive? Explain its block diagram with each component	7M	CO1	L1
	b)	Determine the selection criteria for Electric Drive	7M	CO1	L1
		UNIT–II			
3.	a)	Explain about Gas welding in detail?	7M	CO2	L2
	b)	Write short notes on various methods of welding?	7M	CO2	L2
		OR			
4.	a)	What are the advantages of coated welding electrodes?	7M	CO2	L2
	b)	Explain Direct arc furnace and Indirect Arc furnace?	7M	CO2	L2
		UNIT–III			
5.	a)	A lamp taking 0.5A and 250V is rated at 125 MHCP. Find its efficiency in i) MHCP per watt ii) Lumens per watt	7M	CO3	L3
	b)	Write short notes on Street lighting schemes and Factory lighting schemes	7M	CO3	L3
		OR			
6.	a)	Two Arc lamps of 1000 C.P and 500 C.P respectively (assumed to be same in all directions) are suspended 15m above the ground level and are 30m apart. Find the intensity of illumination at a point on the ground in line with two lamps and 15m from the base of the more powerful lamp.	10M	CO3	L3
	b)	Write short notes on Flood lighting scheme?	4M	CO3	L3

UNIT–IV

7. a) Write short notes on Single phase low frequency AC System of electrification? 7M CO4 L1

   b) Draw and explain a typical speed time curve for an electric train and explain what you understand by crest speed, average speed and schedule speed? 7M CO4 L1

OR

8. a) Explain briefly the tractive effort required, while the train is moving up the gradient and down the gradient? 7M CO4 L1

   b) Explain requirements for ideal traction and show which drive satisfies almost all requirements? 7M CO4 L1

UNIT–V

9. a) Explain the different power flow control modes of a typical parallel hybrid system with the help of block diagrams? 7M CO5 L2

   b) Explain the working of Electric vehicle with neat diagram? 7M CO5 L2

OR

10. a) Compare conventional vehicle with Hybrid electric vehicle? 7M CO5 L2

    b) Discuss the environmental importance of EV and their social impacts? 7M CO5 L2

END

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III B.Tech. II Semester Regular Examinations July 2022
Fundamentals of HVDC & FACTS Devices
(Electrical and Electronics Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Explain the classification of DC links with the help of a neat sketch?	7M	1	2
	b)	Compare AC and DC transmission system in terms of economic aspects, technical performance, and reliability?	7M	1	2
		OR			
2.		Explain the analysis of the Gretz circuit with overlap in the inversion mode and derive the expression for direct current magnitude?	14M	1	2
		UNIT–II			
3.	a)	Draw converter control characteristic and explain why it is desirable to have current control at rectifier station and CEA control at inverter station?	7M	2	4
	b)	Explain the principle of DC link control?	7M	2	2
		OR			
4.	a)	Why harmonics are generated in HVDC converter and what are the problems associated with the harmonics? Suggest some remedial measures?	7M	2	4
	b)	Explain about the various sources of reactive power in HVDC transmission?	7M	2	2
		UNIT–III			
5.	a)	Explain the power flow control in mesh system with an example?	7M	3	2
	b)	Differentiate between simultaneous and sequential method of AC-DC load flow?	7M	3	4
		OR			
6.	a)	What are the possible benefits of FACTS technology?	7M	3	1
	b)	Write a brief note on classification of FACTS controllers?	7M	3	1
		UNIT–IV			
7.		What are the objectives of shunt compensation? Explain how shunt compensation is used for improving mid-point voltage regulation and voltage instability prevention?	14M	4	2
		OR			
8.	a)	Explain, how series compensation is used for improvement of transient stability?	7M	4	2
	b)	Explain briefly about TSSC.	7M	4	2
		UNIT–V			
9.		Explain how the UPFC can control real and reactive power flow in the transmission line.	14M	4	2
		OR			
10.	a)	How the UPFC scheme can be implemented using two back-to-back voltage source converters.	7M	4	3
	b)	Explain the objectives of static shunt and series compensators?	7M	4	2

END