Code: 7G16D

III B.Tech. II Semester Supplementary Examinations December 2022

Object Oriented Programming Concepts

(Common to EEE & ECE)

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	BL
		UNIT–I			
1.	a)	List and explain the elements of object oriented programming.	7M	1	1,2
	b)	Define Recursion. Write a C++ program to find factorial of a number.	7M	1	1,6
		OR			
2.	a)	Mention the different types of constructors. Elaborate parameterized constructors through an example program.	7M	1	2
	b)	Explain Object oriented programming paradigm. Distinguish between Objects and Classes.	7M	1	2,4
		UNIT–II			
3.		Explain the different types of inheritance in C++ with an example	14M	2	2
		OR			
4.	a)	Explain 'this' pointer with an example program.	7M	2	2
	b)	Write a program to display all odd numbered files of a text file.	7M	2	6
		UNIT–III			
5.		Explain any five string handling functions with suitable examples.	14M	3	2
		OR			
6.	a)	What are the operators available in java? Explain them in detail.	8M	3	1,2
	b)	Write a java program to find number of sum of all even integers greater than 50 and less than 150.	6M	3	6
		UNIT–IV			
7.	a)	How can you create and add classes to the package? Illustrate with simple program.	7M	4	1,3
	b)	What is a Thread? How are threads created?	7M	4	1
		OR			
8.	a)	What are the different types of exceptions and explain with program.	7M	4	1,2
	b)	Differentiate between interface and abstract class.	7M	4	2
		UNIT–V			
9.	a)	What are the stages in Thread life cycle? Explain them in detail.	8M	5	1,2
	b)	Write short note on Streams in java.	6M	5	1
		OR			
10.	a)	Write a program to explain thread priorities usage.	7M	5	6
	b)	Explain the method of parameter passing to an applet.	7M	5	2

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III B.Tech. II Semester Supplementary Examinations December 2022
Power System Analysis
(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

		Marks	CO	Blooms Level
1. a)	What are Incidence matrices?	7M	1	L1
b)	Explain about the formation of Bus Incidence matrix by taking suitable example	7M	1	L1

OR

		Marks	CO	Blooms Level
2. a)	Derive the necessary expressions for building up of Z-bus when Element added between Old bus to Reference Bus	7M	1	L3
b)	Derive the necessary expressions for building up of Z-bus when Element added between Two Old buses	7M	1	L3

UNIT–II

		Marks	CO	Blooms Level
3. a)	What is load flow analysis? What is the necessity for load flow studies?	7M	2	L3
b)	Explain the data for Load flow studies	7M	2	L2

OR

		Marks	CO	Blooms Level
4.	Draw the flow chart for Gauss-Seidel method with PV buses and explain	14M	2	L3

UNIT–III

		Marks	CO	Blooms Level
5.	Explain about Short Circuit KVA and short-circuit current.	14M	3	L2

OR

		Marks	CO	Blooms Level
6. a)	Explain different types of reactors briefly	7M	3	L2
b)	Explain the merits and demerits of different types of system protection using reactors.	7M	3	L2

UNIT–IV

		Marks	CO	Blooms Level
7. a)	Derive and explain about Synchronous power coefficient	7M	5	L3
b)	Explain about power angle curve.	7M	5	L2

OR

		Marks	CO	Blooms Level
8.	A 50Hz, 4 pole turbo generator rated 20MVA, 11kv has inertia has constant of H=9kw-sec/KVA. Find thekinetic energy stored in the rotator at synchronous speed. Find the acceleration, if the input less the rotational losses is 26800HP and the electrical power developed is 16MW	14M	5	L3

UNIT–V

		Marks	CO	Blooms Level
9.	What is equal Area Criteria? What are the applications of equal area criterion?	14M	6	L1

OR

		Marks	CO	Blooms Level
10.	Define Point by point method for the solution of Swing equation?	14M	6	L1

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Code: 7G261

R-17

III B.Tech. II Semester Supplementary Examinations December 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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UNIT–I

1. a) What is an incremental fuel cost? Draw incremental fuel cost curve. How is it used in thermal plant operation? 6M
    b) 150 MW, 220 MW, and 220 MW are the ratings of three units located in a thermal power station. Their respective incremental costs are given by the following equations:
    $dC1/dP1 = Rs.(0.11P_1+12)$; $dC2/dP2 = Rs.(0.095P_2+14)$;
    $dC3/dP3 = Rs.(0.1P_3+13)$;
    Where P1, P2 and P3 are the loads in MW. Evaluate the economical load allocation between the three units, when the total load on the station is (i) 350 MW (ii) 500 MW. 8M

OR

2. a) Explain the following terms with reference to power plants: (i) heat input – power output curve (ii) heat rate input (iii) incremental input and (iv) generation cost. 8M
    b) Obtain the condition for optimum operation of a power system with 'n' plants including the effect of transmission losses. 6M

UNIT–II

3. a) Explain about Short term hydro thermal co-ordination with necessary equations 10M
    b) What is the need of optimal scheduling of hydrothermal system? 4M

OR

4. a) Obtain the condition for economic generation of steam and hydro plants for short term scheduling. State any assumptions are made. 7M
    b) Discuss the optimal power flow procedures with its inequality constraints and how to handle dependent variables with penalty function. 7M

UNIT–III

5. a) With a neat diagram explain briefly different parts of turbine speed governing system 8M
    b) Derive the generator load model and represent it by a block diagram. 6M

OR

6. a) Write the modeling equations of turbine speed governing system. Develop the block diagram of turbine speed governing mechanism with first order equations. 7M
    b) Construct a Block Diagram for Generator Load Model and find out the transfer function. 7M

UNIT–IV

7. a) Explain different components of AGC system with a neat diagram and the working mechanism 10M
    b) A single area system has the following data Speed regulation, R =4 Hz/ p.u MW Damping coefficient, B =0.1 p.u MW/Hz, When a load change by 2%, determine AFRC and static frequency error. 4M

OR

8. a) Explain the necessity of maintaining a constant frequency in power system operation 7M
    b) Draw the block diagram of single area LFC system with integral control and prove that the steady state change in frequency is zero. 7M

UNIT–V

9. a) What are the merits and demerits of different types of compensating equipment for transmission system? 10M
    b) Explain the specifications of load compensation 4M

OR

10. a) Explain how the generators act as VAR sources in a power network 7M
    b) Explain about the losses that occur due to VAR flow in power system. 7M

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R-17

Code: 7G263

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

Max. Marks: 70   Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Explain the recovery theory and energy balance theory of arc interruption in a circuit breaker.   8M

    b) In 110kV system the phase to ground capacitance is 0.02 µF and inductance is 8H. Calculate the voltage appearing across the pole of C.B, if a magnetizing current of 6A is interrupted. Calculate the value of resistance to be used across the contact space to eliminate the striking voltage transient.   6M

OR

2. a) Describe with a neat sketch explain the operation of a Vacuum circuit breaker and list out its merits and demerits   9M

    b) Write short notes on current chopping and resistance switching.   5M

UNIT–II

3. a) Explain principle of operation of impedance relay.   7M

    b) The current rating of a relay is 5A.PSM & TSM respectively are 1.5 & 0.4, fault current 6000A, determine the operating time of the relay for a TMS=0.4,at TMS=1, operating time at various PSM are

PSM	2	4	5	8	10	20
Operating time	10	5	4	3	2.8	2.4

7M

OR

4. a) Explain briefly about IDMT static relays.   7M

    b) Describe the construction and principle of operation of an induction type relay.   7M

UNIT–III

5. a) What are the abnormal conditions in a large synchronous generator against which protection is necessary?   8M

    b) An 11KV, 30 MVA star connected generators has reactance of 5   per phase and negligible resistance. Merz-price protection is used for protection of winding. The neutral grounding resistance is 9 . If only 15% of the winding is to remain unprotected, find the setting of the relay.   6M

OR

6. a) Describe the harmonic restraint relay used to protect transformers with neat diagram.   8M

    b) 3-Phase, 33/132 KV transformer is connected star-delta and C.T's on the LV side have ratio 200:5. What will be the ratio of CT on the HV side of Merz-price protection is to be adopted.   6M

UNIT–IV

7. a) Explain the construction and principle of operation of a translay relay applied to single phase system.   7M

    b) Give schemes of protection for a parallel feeder fed from: (i) One end (ii)Both the ends   7M

OR

8. a) Discuss the three zone distance relay protection.   7M

    b) Explain the carrier current protection.   7M

UNIT–V

9. a) Describe the construction and working principle of valve type arrester with neat sketch.   7M

    b) Explain the basic impulse insulation level with significance.   7M

OR

10. a) Why is insulation coordination required in a large power system? What is meant by BIL of equipment?   7M

    b) Explain arcing grounds and grounding practices.   7M

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III B.Tech. II Semester Supplementary Examinations December 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	BL

UNIT–I

| 1. | a) | Classify various types of loads? Give examples of loads which are a function of a speed? | 7M | 1 | 3 |
| | b) | Explain the term load equalization | 7M | 1 | 3 |

OR

| 2. | a) | Discuss different types of drives available for transmission of power from the driving mechanisms to loads. | 7M | 1 | 4 |
| | b) | Explain the importance of load equalization with an example. | 7M | 1 | 3 |

UNIT–II

| 3. | a) | Explain the procedure for submerged arc welding | 7M | 2 | 3 |
| | b) | Write the comparison between AC and DC welding. | 7M | 2 | 3 |

OR

| 4. | a) | What is the nature of electric supply required for electric arc welding? Also explain the equipment required for electric arc welding | 7M | 2 | 3 |
| | b) | What are the advantages of using coated welding electrodes? | 7M | 2 | 3 |

UNIT–III

| 5. | a) | Explain the following terms
(i) Illumination (ii) Luminous flux (iii) MSCP (iv) Lumen (v) Lamp efficiency | 7M | 3 | 3 |
| | b) | The flux emitted by 100-W lamp is 1,400 lumens placed in a frosted globe of 40 cm diameter and gives uniform brightness of 250 milli-lumens/m2 in all directions. Calculate the candel power of the globe and the percentage of light absorbed by the globe. | 7M | 3 | 3 |

OR

| 6. | a) | State and prove Inverse square law and cosine law. | 7M | 3 | 3 |
| | b) | The luminous intensity of a source is 600 candela is placed in the middle of a 10 × 6 × 2 m room. Calculate the illumination:
(i) At each corner of the room. (ii) At the middle of the 6-m wall. | 7M | 3 | 3 |

UNIT–IV

| 7. | a) | Explain the requirements of ideal traction system | 7M | 4 | 3 |
| | b) | A 2,300-ton train proceeds down a gradient of 1 in 100 for 5 min, during which period, its speed gets reduced from 40 to 20 kmph by the application of the regenerative braking. Find the energy returned to the lines if the tractive resistance is 5 kg/ton, the rotational inertia 10%, and the overall efficiency of the motors during regeneration is 80%. | 7M | 4 | 3 |

OR

| 8. | a) | A train has schedule speed of 32 kmph over a level track distance between two stations being 2 km. The duration of stop is 25 s. Assuming the braking retardation of 3.2 kmphps and the maximum speed is 20% greater than the average speed. Determine the acceleration required to run the service. | 7M | 4 | 3 |
| | b) | Derive the expression for (i) The tractive effort for propulsion of train on level track.
(ii) The tractive effort for propulsion of train up and down a gradient | 7M | 4 | 3 |

UNIT–V

| 9. | a) | Explain the impact of modern drive trains on energy supplies | 7M | 5 | 3 |
| | b) | Explain regenerative braking applied in electric vehicles | 7M | 5 | 3 |

OR

| 10. | | Explain about different battery storage systems. | 14M | 5 | 3 |

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III B.Tech. II Semester Supplementary Examinations December 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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UNIT–I

1.	a)	Explain various Addressing modes of 8086 microprocessor.	7M
	b)	Write an 8086 ALP to find the sum of numbers in the array of 10 elements.	7M

OR

2.	a)	Explain the memory segmentation and instruction byte Queue of 8086.	7M
	b)	Write an assembly language program (ALP) which counts the number of A's and a's in given string of characters.	7M

UNIT–II

3.	a)	Describe the interrupts of 8086 and its types with service routine	6M
	b)	Explain in detail about 8259 PIC architecture	8M

OR

4.	Explain in detail, the (i) Modes of operation (ii) Bit Set-Reset and (iii) Mode Set Control words of 8255 Programmable Peripheral Interface.	14M

UNIT–III

5.	a)	What is RS-232C device and discuss its application with TTL	7M
	b)	Draw the circuit of RS232C to TTL conversion and explain this interface.	7M

OR

6.	What are MODEM control lines? Explain the function of each line. Discuss how MODEM is controlled using these lines with necessary sequence of instructions.	14M

UNIT–IV

7.	a)	Discuss the various type of addressing modes with suitable example in 8051 micro controller	7M
	b)	Write an 8051 assembly language program to multiply the given number 48H and 30H.	7M

OR

8.	a)	Give PSW of 8051 and describe the use of each bit in PSW	7M
	b)	With the help of neat diagram explain the memory organization of 8051 microcontroller	7M

UNIT–V

9.	a)	Explain the Pin functions of Arduino with a neat block diagram	7M
	b)	Explain about PWM and ADC in Arduino	7M

OR

10.	Draw the diagram of ARM architecture and explain the function of each block along with different features in it.	14M

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