Code: 7G16D

III B.Tech. II Semester Supplementary Examinations April 2023
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)	Define constructor and write a C++ program to implement types of constructors.	7M	1	1,6
	b)	What is a reference variable? Explain the usage of reference variable.	7M	1	1,2
OR					
2.	a)	What are constructors? Explain constructor overloading with an example program.	7M	1	1,2
	b)	Describe the benefits offered by OOP.	7M	1	2
UNIT–II					
3.	a)	Define Inheritance. Write a C++ program to demonstrate multiple inheritances.	7M	2	1,6
	b)	What is mean by Overloading? Explain about function overloading with suitable program.	7M	2	1,2
OR					
4.	a)	What is polymorphism? Explain with an example.	7M	2	1,2
	b)	Explain about various manipulators of C++ language.	7M	2	2
UNIT–III					
5.	a)	Distinguish between Java & C++.	7M	3	4
	b)	List and Explain Data types in Java.	7M	3	1,2
OR					
6.	a)	Explain about decision making statements in Java.	7M	3	2
	b)	Write a program to find the number of and sum of all integers greater than 150 and less than 250 that are divisible by 6.	7M	3	6
UNIT–IV					
7.	a)	Write an example program to create threads using Thread class.	7M	4	6
	b)	Describe interface. How can you implement interface in java? Explain with suitable program.	7M	4	1,2
OR					
8.	a)	Give a detail note on interfaces and packages in java with examples.	7M	4	1
	b)	Write a java program to implement the built-in exception.	7M	4	6
UNIT–V					
9.	a)	Demonstrate the passing parameters to the applet with example.	7M	5	3
	b)	Explain thread class extending in JAVA with suitable example.	7M	5	2
OR					
10.	a)	How can you create a thread in java? Write a Java Program to create a thread using Thread Class.	7M	5	1,6
	b)	Explain role of applet in designing a web page.	7M	5	2

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III B.Tech. II Semester Supplementary Examinations April 2023
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	BL

UNIT–I

| 1. | Derive the expression for admittance matrix (Y-bus) using Direct inspection method for a 3 Bus power system network. | 14M | 1 | L3 |

OR

| 2. | a) | What is a primitive network and represents its forms? | 7M | 1 | L1 |
| | b) | Prove $Y_{BUS} = A^T[Y] A$ using singular transformation. | 7M | 1 | L3 |

UNIT–II

| 3. | Write short notes on
(i)Load Bus (ii) generator bus (iii)Slack bus | 14M | 2 | L1 |

OR

| 4. | a) | What is Acceleration factor and Explain its role gauss seidel method? | 7M | 2 | L1 |
| | b) | State merits and demerits of Gauss-Seidel method. | 7M | 2 | L1 |

UNIT–III

| 5. | a) | Define positive, negative, and zero sequences components in 3 phase systems. | 7M | 4 | L2 |
| | b) | Explain about Sequential components for star connected load. | 7M | 4 | L2 |

OR

| 6. | Derive an expression for the fault current for the LG fault.
i) with impedance ii) without impedance | 14M | 3 | L3 |

UNIT–IV

| 7. | Explain about steady-state stability power limit. | 14M | 5 | L2 |

OR

| 8. | Define Transfer Reactance? What is the value of X for maximum power transfer? | 14M | 5 | L3 |

UNIT–V

| 9. | State and derive swing equation? | 14M | 6 | L1 |

OR

| 10. | What is critical clearing angle? Derive an expression for critical clearing angle. | 14M | 6 | L3 |

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III B.Tech. II Semester Supplementary Examinations April 2023
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	CO	BL

UNIT–I

1. a) The fuel input per hour of plant 1 and 2 are given as

$C1=0.2P_1^2 +40P_1+120$ Rs/h $C2=0.25P_2^2+30P_2+150$ Rs/h

Determine the economic operating schedule and the corresponding cost of generation if the max and min loading on each unit is 100MW and 25MW, the demand is 180 MW and transmission losses are neglected. If the load is equally shared by both the units, determine the saving obtained by loading the units as per equal incremental production cost. **8M 1 3**

   b) What is a penalty factor in economic scheduling? Give its significance. **6M 1 1**

OR

2. a) Explain various factors to be considered in allocating generation to different power stations for optimum operation. **8M 1 1**

   b) A system consists of two generating plants with fuel costs of:

$C1=0.03P_1^2+15P_1+1.0$ $C2=0.04P_2^2+21P_2+1.4$

The system operates on economic dispatch with 120MW of power generation by each plant. The incremental transmission loss of plant-2 is 0.15. Find the penalty factor of plant-1. **6M 1 3**

UNIT–II

3. a) Derive the coordination equation for the optimal scheduling of hydrothermal interconnected power plants. **8M 1 6**

   b) Explain optimal power flows. **6M 1 2**

OR

4. Explain and write the mathematical formulation for optimal scheduling of Hydro thermal system. Explain any one solution technique of solving equations with the help of an algorithm **14M 1 2**

UNIT–III

5. a) Obtain the transfer function and block diagram representation of First order turbine model **7M 3 2**

   b) Draw the schematic diagram of a speed governing system and explain the functioning of its components. Also obtain the mathematical model. **7M 3 4**

OR

6. a) Derive the transfer function of a single area system with a block diagram. **7M 3 6**

   b) Explain the flat frequency control. **7M 3 1**

UNIT–IV

7. a) Explain the LFC of an Isolated power system **8M 2 1**

   b) Two Turbo-alternators rated for 110 MW and 210 MW have governor droop characteristic of 5% from No load to Full load. They are connected in parallel to share a load of 250 MW. Determine the load shared by each machine assuming free governor action. **6M 2 3**

OR

8. a) Write the state space representation of AGC for single area. **7M 2 1**

   b) How does load frequency control is achieved by considering economic dispatch. **7M 2 1**

UNIT–V

9. a) Explain the reasons for variation of voltages in power systems and explain any one method to improve voltage profile **7M 3 1**

   b) Derive the relation between reactive power flow and the voltage of bus. **7M 3 6**

OR

10. a) Describe the performance of uncompensated transmission lines. **7M 3 1**

    b) Describe the constructional features of a synchronous capacitor. Explain its operation and discuss various applications in power system operation. **7M 3 1**

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III B.Tech. II Semester Supplementary Examinations April 2023
Utilization of Electrical Energy
(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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			Marks	CO	BL
		UNIT–I			
1.	a)	Define electric drive? Explain each unit of drive. List various speed control methods in drives.	7M	1	I
	b)	Draw and explain electrical and mechanical characteristics of DC Series motor.	7M	1	II
		OR			
2.	a)	Discuss the merits and demerits of group and individual drive.	7M	1	II
	b)	Explain load equalization.	7M	1	II
		UNIT–II			
3.	a)	Write the advantages of electric heating. Write few applications of induction and dielectric heating.	7M	2	I
	b)	Compare AC and DC welding.	7M	2	II
		OR			
4.	a)	What is resistance welding? What are its limitations?	7M	2	I
	b)	A slab of insulating material 150 sq-cm in area and 1 cm thick is to be heated by dielectric heating. The power required is 400 W at 30 MHz. Material has permittivity of 5 and pf of 0.05. Absolute permittivity is 8.854×10^{-12} F/m. Determine the necessary voltage.	7M	2	III
		UNIT–III			
5.	a)	Define i) Luminous flux ii) Utilization factor iii) Candle power	6M	3	I
	b)	Discuss Sodium vapour lamp with neat diagram.	8M	3	II
		OR			
6.	a)	Discuss lighting schemes.	6M	3	II
	b)	The illumination at a point on a working plane directly below the lamp is to be 100lumens/sq mt. The lamp gives 256 cp uniformly below the horizontal plane. Determine the height at which lamp is suspended. Also find the illumination at a point on the working table 1.2 mt away from the vertical axis of the lamp.	8M	3	III
		UNIT–IV			
7.	a)	Discuss the quadrilateral speed time curve.	8M	4	II
	b)	Write a review on electric traction system in India.	6M	4	I
		OR			
8.	a)	Derive expressions for distance travelled using quadrilateral approximation method of V(t) curve.	7M	4	II
	b)	An electric train has a schedule speed of 25km/hr between stations 800m apart. The stop duration is 20 sec, maximum speed is 20% higher than the average running speed and the braking retardation is 3km/hr/sec. Calculate the rate of acceleration required to operate this service.	7M	4	III
		UNIT–V			
9.	a)	Explain the social and environmental importance of hybrid electric vehicles	7M	5	III
	b)	Explain about Maximum Tractive Effort and Power train Tractive Effort	7M	5	IV
		OR			
10.	a)	Enumerate the history of electric vehicles	7M	5	III
	b)	Explain the Braking Performance in electric vehicles.	7M	5	IV

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III B.Tech. II Semester Supplementary Examinations April 2023
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	BL
	UNIT–I				
1.		With a neat block diagram explain the architecture of 8086 in minimum mode operation and also explain the timing diagram for input and output transfer on a minimum mode	14M	CO1	L2
		OR			
2.	a)	Draw the pin diagram of 8086 microprocessor and explain the functions of the following pins. (i) ALE (ii) NMI (iii) INTR (iv) HOLD (v) HLDA (vi) BHE (vii) LOCK	7M	CO1	L2
	b)	What is a procedure? What are different types of procedures in 8086? Discuss each type of procedure with examples.	7M	CO1	L1
		UNIT–II			
3.	a)	Explain how an ADC can be interfaced with 8086 microprocessor	7M	CO2	L2
	b)	Explain how the stepper motor can be interfaced with 8086 microprocessor.	7M	CO2	L2
		OR			
4.	a)	Explain the function of Programmable Peripheral Interface PPI in detail with the help of block diagram.	7M	CO2	L2
	b)	Draw and discuss the architecture of 8257 DMA controller?	7M	CO2	L3
		UNIT–III			
5.		Explain 8251 UART Architecture and it's functionality.	14M	CO3	L2
		OR			
6.	a)	Draw the circuit of TTL to RS-232 and explain the necessity of this interface.	7M	CO3	L2
	b)	Discuss the overrun error and framing error with reference to 8251	7M	CO3	L2
		UNIT–IV			
7.		Describe the functions of various pins of 8051 microcontroller with pin diagram.	14M	CO4	L2
		OR			
8.	a)	What is the difference between the Microprocessors and Microcontrollers?	7M	CO4	L2
	b)	Explain the I/O pin ports and circuit details of 8051 microcontroller	7M	CO4	L2
		UNIT–V			
9.	a)	Explain in detail about ARM micro controller features and applications	7M	CO5	L2
	b)	Discuss about ARM 7 and ARM 9 microcontrollers	7M	CO5	L2
		OR			
10.	a)	Explain the operation of BL instruction. Also mention the state of ARM registers	7M	CO5	L2
	b)	List the special features of ARM controller design	7M	CO5	L1

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