Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem Examination Dec 2024

EE3CO58 Object Oriented Programming

Programme: B.Tech. Branch/Specialisation: EE

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	PO	CO	PSO
Q.1	i.	Which concept in OOP represents hiding the internal details of an object? (a) Polymorphism (b) Inheritance (c) Encapsulation (d) Abstraction	**1**	1	1	1	
	ii.	Which of the following is NOT a characteristic of object-oriented programming? (a) Encapsulation (b) Abstraction (c) Linear execution (d) Inheritance	**1**	1	1	2	
	iii.	Which of the following best describes encapsulation? (a) Creating a blueprint of an object (b) The process of defining attributes (c) Wrapping data and methods into a single unit (d) Inheritance of properties	**1**	1	1	2	
	iv.	What term describes the characteristics and behaviours associated with a class? (a) Objects (b) Attributes (c) Methods (d) Variables	**1**	1	1	3	
	v.	In a recursive association, an instance of a class: (a) Aggregates another instance (b) Associates with itself (c) Inherits from another class (d) Delegates to another instance	**1**	1	1	3	

P.T.O.

	vi.	What type of association represents a "Whole-part" relationship? (a) Composition (b) Aggregation (c) Association (d) Inheritance	**1**	1	1	2
	vii.	What access specifier allows a method to be visible within the same package and subclasses? (a) Private (b) Public (c) Protected (d) Static	**1**	1	1	2
	viii.	Which of the following represents dynamic polymorphism? (a) Operator overloading (b) Function overloading (c) Method hiding (d) Virtual functions	**1**	1	1	3
	ix.	Which of the following allows objects to be written to files? (a) Operator overloading (b) Stream classes (c) Virtual functions (d) Polymorphism	**1**	1	1	4
	x.	Which type of container can hold objects of different data types? (a) Static container (b) Homogeneous container (c) Heterogeneous container (d) Persistent container	**1**	1	1	5
Q.2	i.	Define object-oriented programming.	**2**	1	1	1
	ii.	Differentiate between object-oriented and procedure-based programming approaches.	**3**	1	1	2
	iii.	Discuss the applications of OOP with examples in real-world software.	**5**	2	2	3
OR	iv.	Explain how abstraction and encapsulation are implemented in OOP.	**5**	2	2	3

Q.3	i.	What is the role of a constructor in an object's lifetime?	**4**	2	2	1
	ii.	Define encapsulation and information hiding and illustrate how these principles protect the integrity of data in a program.	**6**	2	2	3
OR	iii.	Explain the difference between static and dynamic objects with examples.	**6**	3	1	3
Q.4	i.	What is the difference between association and aggregation?	**3**	1	1	3
	ii.	Explain aggregation and delegation, including their importance in building class relationships in OOP.	**7**	2	2	3
OR	iii.	Discuss the types of associations between objects and provide examples of each.	**7**	1	1	4
Q.5	i.	What is the difference between static and dynamic polymorphism?	**4**	2	1	4
	ii.	Describe the types of inheritance with examples to demonstrate single and multiple inheritance.	**6**	2	2	5
OR	iii.	Discuss the purpose of abstract classes and methods in OOP and explain how they contribute to polymorphism and inheritance.	**6**	2	2	5
Q.6		Attempt any two:				
	i.	Explain template classes and template functions with examples.	**5**	1	2	4
	ii.	Describe the different types of container classes and their uses.	**5**	2	2	3
	iii.	Define persistent objects and their importance in programming.	**5**	3	3	5

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Marking Scheme
EE3CO58 Object Oriented Programming (T)

Q.1	i)	Which concept in OOP represents hiding the internal details of an object? (c) Encapsulation	**1**
	ii)	Which of the following is NOT a characteristic of object-oriented programming? (c) Linear execution	**1**
	iii)	Which of the following best describes encapsulation? (c) Wrapping data and methods into a single unit	**1**
	iv)	What term describes the characteristics and behaviours associated with a class? (b) Attributes	**1**
	v)	In a recursive association, an instance of a class: (b) Associates with itself	**1**
	vi)	What type of association represents a "whole-part" relationship? (a) Composition	**1**
	vii)	What access specifier allows a method to be visible within the same package and subclasses? (c) Protected	**1**
	viii)	Which of the following represents dynamic polymorphism? (d) Virtual functions	**1**
	ix)	Which of the following allows objects to be written to files? (b) Stream classes	**1**
	x)	Which type of container can hold objects of different data types? (c) Heterogeneous container	**1**
Q.2	i.	Define object-oriented programming. Definition and example 1 mark for each	**2**
	ii.	Differentiate between object-oriented and procedure-based programming approaches. 3 difference 1 mark for each	**3**
	iii.	Discuss the applications of OOP with examples in real-world software. Applications of OOP 3 marks Real-world example 2 marks	**5**
OR	iv.	Explain how abstraction and encapsulation are implemented in OOP. abstraction implementation 2.5 marks encapsulation implementation 2.5 marks	**5**
Q.3	i.	What is the role of a constructor in an object's lifetime? 4 roles of constructor 1 mark for each	**4**
	ii.	Define encapsulation and information hiding and illustrate how these principles protect the integrity of data in a program. encapsulation and information hiding 2 marks each How protect the integrity 1 mark	**6**
OR	iii.	Explain the difference between static and dynamic objects with examples. 3 difference 1 mark for each Example 2 marks	**6**
Q.4	i.	What is the difference between association and aggregation? 3 difference 1 mark for each	**3**
	ii.	Explain aggregation and delegation, including their importance in building class relationships in OOP. aggregation and delegation 2 marks each importance 3 marks	**7**
OR	iii.	Discuss the types of associations between objects and provide examples of each. types of associations 4 marks examples 3 marks	**7**
Q.5	i.	What is the difference between static and dynamic polymorphism? 4 difference 1 mark for each	**4**
	ii.	Describe the types of inheritance with examples to demonstrate single and multiple inheritance. Types of inheritance 4 marks examples to demonstrate single and multiple inheritance. 2 marks	**6**
OR	iii.	Discuss the purpose of abstract classes and methods in OOP, and explain how they contribute to polymorphism and inheritance. Abstract class &methods 3 marks	**6**

how they contribute to polymorphism and inheritance 3 marks

Q.6 Attempt any two:

i. Explain Template Classes and Template Functions with examples. **5**
   Template Classes 2.5 marks
   Template Functions 2.5 marks

ii. Describe the different types of container classes and their uses. **5**
   Types of container 3 marks
   Uses 2 marks

iii. Define persistent objects and their importance in programming. **5**
   persistent objects 3 marks
   importance 2 marks

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