Software Engineering
Assignment-8
TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10**   **Total mark: 10 X 1 = 10**

For each of the following questions one or more of the given options are correct. Choose the correct options.

QUESTION 1:

Consider the following sentence: "A square is a polygon". From an analysis of the sentence, identify the relations between the two classes Square and Polygon that can be inferred from the sentence.

     a. Inheritance
     b. Association
     c. Aggregation
     d. Composition
     e. Dependency

Correct Answer: a. Inheritance

Detailed Solution:

"A square is a polygon" – represents "Is a" relationship. So, inheritance can be inferred from the sentence. So, option **a.** is correct.

QUESTION 2:

Consider the sentence: `A college has many Students`. Which one of the following best characterizes the relationship that exists between the **College** class and the **Student** class?

     a. Inheritance
     b. Specialization
     c. Association
     d. Composition
     e. Dependency

Correct Answer: c. Association

Detailed Solution:

A college has many students. Here college class and student class are associated with each other.

QUESTION 3:

Consider the following sentence: "100 paisa is one rupee". From an analysis of the sentence, identify the relation between the two classes Paisa and Rupee that can be inferred from the sentence.

      a. Inheritance
      b. Association
      c. Aggregation
      d. Composition
      e. Dependency

Correct Answer: d. Composition

Detailed Solution:

"100 paisa is one rupee" – one rupee composed with 100 paisa. So, it represents composition, it is not "Is a" relationship.

QUESTION 4:

Consider the following sentence: "Students live in hostels". From an analysis of the sentence, identify the relation between the two classes Student and Hostel that can be inferred from the sentence.

      a. Inheritance
      b. Association
      c. Aggregation
      d. Composition
      e. Dependency

Correct Answer: b. Association

Detailed Solution:

"Students live in hostels" --- here Student and Hostel are associated with each other. Student and Hostel are two entities here so it is a binary association.

QUESTION 5:

A collaboration diagram is used by the designers for its capability to effectively depict which one of the following types of information?

   a.   The decision structure among the classes
   b.   The looping structure
   c.   The attribute values of the objects
   d.   Structural information such as class association
   e.   Times at which collaboration occurs among classes

Correct Answer: d. Structural information such as class association

Detailed Solution:

A **collaboration diagram**, also known as a communication **diagram**, is an illustration of the relationships and interactions among software objects in the Unified Modeling Language (UML). It also represents class associations. So, option **d**. is the correct option.
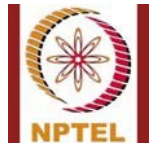
QUESTION 6:

How is an external system represented in a use case diagram?

   a.   By using a specific icon available for this purpose

   b.   By using text description

   c.   By using object constraint language (OCL)

   d.   By stereotyping the actor icon

   e.   By inheriting a special icon from the actor icon

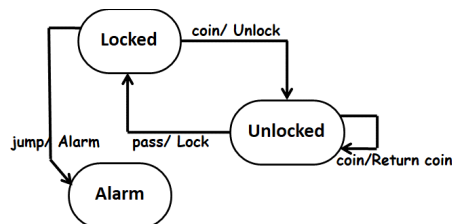**Correct Answer: d.** By stereotyping the actor icon

Detailed Solution:

External system used in a use case diagram by adding a stereotype in the actor icon.
So, option d. is the correct option.

QUESTION 7:

Consider the following state chart diagram modelling the behaviour of a turnstile gate. Based on the modelled behaviour, what would happen if a coin is inserted into the turnstile gate when the turnstile gate is in the unlocked state?

- a. The turnstile gate allows one person to pass and remains in the unlocked state
- b. The turnstile gate sounds an alarm and remains in the unlocked state
- c. The turnstile gate remains in the unlocked state
- d. The turnstile gate returns the coin and remains in the unlocked state
- e. The turnstile gate returns the coin and becomes locked
- f. The turnstile gate becomes locked

Correct Answer: d. The turnstile gate returns the coin and remains in the unlocked state

Detailed Solution:
From the question figure we can observed that in Unlocked state if a coin inserted it will be return and the system will remain in the Unlocked state.

QUESTION 8:

Which of the following features of the state chart model are primarily responsible towards reduced number of states in the finite state modelling of a given problem?

        a. Nested states

        b. Concurrent states

        c. History state

        d. Broadcast messages

        e. Actions on state entry and exit

Correct Answer: a. Nested states, **b.** Concurrent states

Detailed Solution:

    Nested states and concurrent states reduces the state explosion problem in state chart diagram. Therefore, it reduces the number of states in the finite state modelling.

NPTEL Online Certification Courses

Indian Institute of Technology Kharagpur

QUESTION 9:

Consider the following statement: "India shares borders with Pakistan, Bangladesh, and China." Which one of the following is the best way to implement this in an object-oriented program?

        a. Define a unary association on Country class

        b. Let **Country** class implement the Border interface

        c. Define **Country** class as an aggregate of **Border** classes

        d. Define a dependency of **Country** class on **Border** class

        e. Define a quaternary association relation between the Countries **India**, **Pakistan**, **Bangladesh**, and **China**

Correct Answer: a. Define a unary association on Country class

Detailed Solution:

Here countries are divided by border. So, we can define a self-association in country class with association name 'Border.'

QUESTION 10:

In an informal (natural language) description of a programming problem, which parts of the description are likely represent objects?

      a. All of the nouns and all of the verbs.
      b. All of the verbs and some of the nouns.
      c. Some of the nouns.
      d. Some of the verbs
      e. Some of the nouns and some of the verbs

Correct Answer: c. Some of the nouns.

Detailed Solution:

A proper noun implies an object (instance of a class): CSE Dept, OOSD, etc. So, option c. Some of the nouns is the correct option.