These questions are from:

Question 1 (1 mark)   Annotations

1 **Place the following software development steps in the correct order by clicking and holding each step and dragging it into its position. (1 mark)**

:: Design

:: Installation

:: Maintenance

:: Development

:: Testing and debugging

:: Determining specifications

Question 2 (3 marks)   Annotations

An online business is planning to use a database to keep track of its products. The contents of the Products table during testing are shown.

Products

ProductID	ProductName	ProductPrice
P001	The Plant (DVD)	28.00
P002	Discovery 1 and 2 (DVD)	26.98
P003	Travel 1 and 2 (Blu-Ray)	22.00
P004	The Best Movie (DVD)	19.98
P005	Celebration (DVD)	12.00

After executing a SQL query, the following results were obtained.

ProductName	ProductPrice
Discovery 1 and 2 (DVD)	26.98
The Plant (DVD)	28.00
Travel 1 and 2 (Blu-Ray)	22.00

2 Select the correct item from each dropdown menu to show how the results were obtained. (3 marks)
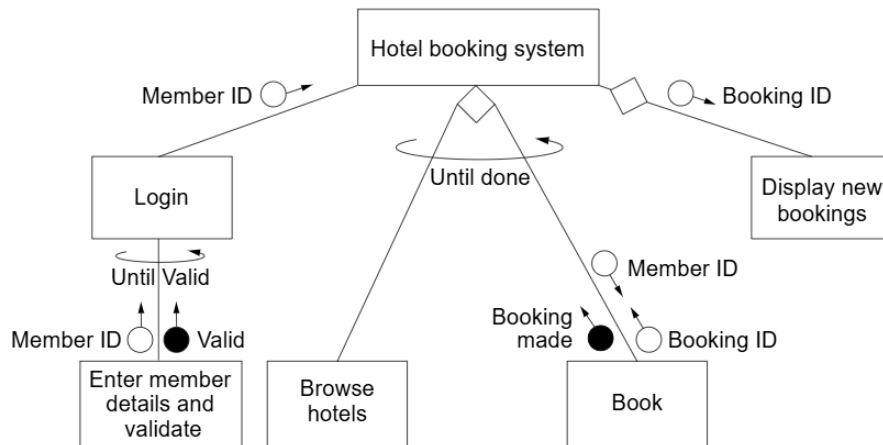
SELECT ☐ ☐

FROM ☐

WHERE ☐ ☐ ☐

ORDER BY ☐ ☐

‹ **Previous question**   **Next question** ›

Question 3 (2 marks) Annotations

3 Match each of the features to the relevant protocol(s). (2 marks)

	POP3	SMTP	IMAP
Commonly used for sending email	☐	☐	☐
Commonly used for receiving email	☐	☐	☐
Allows email to synchronise across devices	☐	☐	☐
Server deletes messages when they are downloaded and opened	☐	☐	☐

Question 4 (2 marks)   Annotations

This structure chart describes a hotel booking system.

4 Select the items that are TRUE about this structure chart. (2 marks)

(Multiple items may be selected.)

- ☐ **Booking made** is a flag.
- ☐ **Login** is the first module called.
- ☐ **Booking ID** may only be true or false.
- ☐ **Display new bookings** may not be executed.
- ☐ Members do not need to log in to browse hotels.
- ☐ A choice is continually offered between **Browse hotels** and **Book**.
- ☐ **Login** calls **Enter member details and validate** when Member ID is set to true.

Question 5 (3 marks) Annotations

Consider the following algorithm.

```
BEGIN determineGrade
    get Mark
    CASEWHERE Mark
        >=80 : Grade = "H"
        >=50 : Grade = "P"
        OTHERWISE : Grade = "N"
    ENDCASE
    print Grade
End determineGrade
```

5 Use the following table to provide a set of test data that will thoroughly test the algorithm. Include the expected outputs and reasons for inclusion. You may assume that all input data are valid. (3 marks)

Test data (Mark)	Expected output (Grade)	Reason for inclusion

< Previous question   Next question >

Question 6 (3 marks) Annotations

A new operating system is to be developed for a mobile phone. The operating system needs to allow users to install a variety of third-party applications such as social media applications and games on the phone.

6 Discuss the use of *sandboxing* in this operating system. (3 marks)

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< Previous question
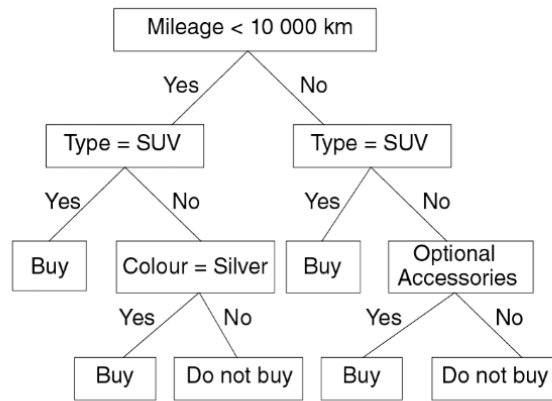
Next question >

Question 7 (4 marks) Annotations

Consider the following decision tree of a trained machine learning model that determines whether to purchase a vehicle.

7 (a) Using the decision tree, determine the outcome of each of the following situations. (1 mark)   hide ⌃

	Buy	Do not buy
Mileage = 8000 km, Colour = Silver, Optional Accessories = No	○	○
Mileage = 11 000 km, Colour = Red, Optional Accessories = Yes	○	○
Type = SUV, Colour = Red, Optional Accessories = No	○	○

7 (b) The decision tree can be simplified without compromising its logic.   Full screen   Reset   hide ⌃

Redraw the decision tree to reduce the number of branches. (3 marks)

To move canvas, hold mouse wheel or spacebar while dragging, or use the hand tool

Library

Question 8 (3 marks)

The following subroutine is intended to search an array for an item and output the position of that item in the array. There are several mistakes in the algorithm.

```
BEGIN Search (SearchItem)
    Set LastIndex to the number of elements in ItemArray
    Index = 1
    WHILE Found = FALSE OR Index < LastIndex
        IF Index = SearchItem THEN
            Found = TRUE
        ENDIF
    ENDWHILE
    IF Found = TRUE THEN
        Display 'Position', Index
    ELSE
        Display 'Not found'
    ENDIF
END Search
```

8 Copy the algorithm into the space below and modify the algorithm logic so that it achieves its intended purpose. (3 marks) **Full screen**

The array is called ItemArray and it is indexed from 1.

```
1 |
```

< Previous question   Next question >

Question 9 (6 marks) Annotations

An online store allows users to register for an account using their name, phone number and date of birth. Users must also create a username and password.

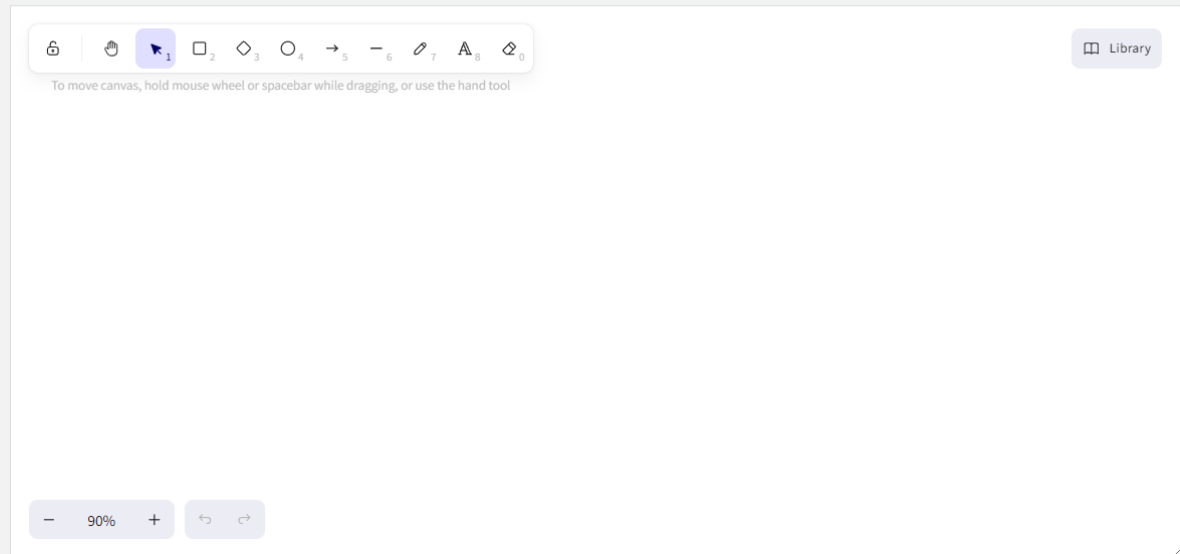Each username must satisfy these rules.

- There must be no more than 8 characters.

- Only uppercase and lowercase letters are accepted.

- The character "<" is not allowed, to prevent attempts at injecting code through the username.

9 (a) Design a user interface for registering an account. Clearly label all features. (3 marks)

Full screen   Reset   hide ⌃

To move canvas, hold mouse wheel or spacebar while dragging, or use the hand tool

Library

—   90%   +   ↶ ↷

9 (b) Write a function in Python that will check whether a username satisfies the rules. (3 marks)

Full screen   Run   hide ⌃

```
1  # Input code
2
```

Output

Question 10 (4 marks) Annotations

Consider the following source code for a web page.

```html
<html>
    <body>
    <link rel="stylesheet" href="style3.css"/>
    <script src="image-gallery.js"/><!--this script is slow to load-->
    <link rel="stylesheet" href="styles1.css"/>
    <link rel="stylesheet" href="styles2.css"/>
    <h1>My Awesome Website!</h1>
    <p>I hope you like my website, I spent a lot of time designing it.</p>
    <h2>Photos from my holiday</h2>
    <img src="holiday1_4000x3000.jpg" width="640" height="480"/>
    <img src="holiday2_4000x3000.jpg" width="640" height="480"/>
    <img src="holiday3_4000x3000.jpg" width="640" height="480"/>
    <img src="holiday4_4000x3000.jpg" width="640" height="480"/>
    </body>
</html>
```

10 **The web page is loading too slowly.**

Explain how the load time of this page can be improved. (4 marks)

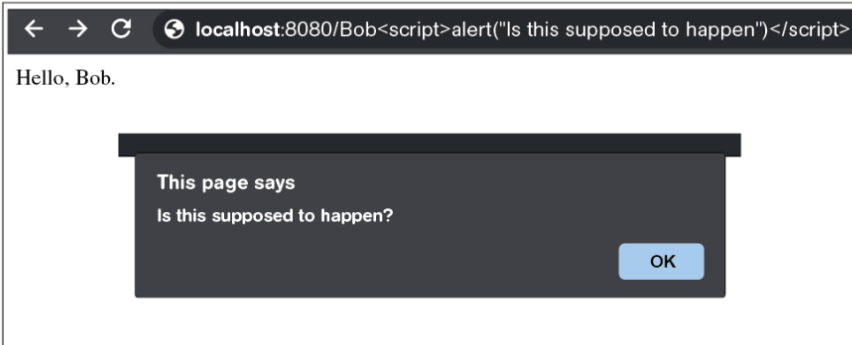| B | U | I | ⋮≡ | ≟≡ | ⇥≣ | ≣⇤ | ⊞ | x₂ | x² | ✂ | ▣ | 📋 | ↶ | ↷ | Ω | Σ | ABC ▾ |

0 / 90 words

‹ Previous question   Next question ›

Question 11 (3 marks) Annotations

Bob is testing a website for vulnerability. The website allows the user to add their name at the end of the URL and prints their name on the webpage.

In addition to his name, Bob has added some code to the URL and the following is displayed.

← → C 🌐 localhost:8080/Bob<script>alert("Is this supposed to happen")</script>

Hello, Bob.

This page says

Is this supposed to happen?

OK

---

11 (a) What type of vulnerability is being demonstrated? (1 mark) hide ⌃

○ Invalid redirecting

○ Cross site scripting

○ Broken authentication

○ Cross site request forgery

11 (b) Explain ONE way to minimise this vulnerability. (2 marks) hide ⌃

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< Previous question   Next question >

Question 12 (5 marks) Annotations

An online business is planning to use a database to keep track of its products, customers and orders. The contents of the Products, Customers and Orders tables during testing are shown.

Products

ProductID	ProductName	ProductPrice
P001	The Plant (DVD)	28.00
P002	Discovery 1 and 2 (DVD)	26.98
P003	Travel 1 and 2 (Blu-Ray)	22.00
P004	The Best Movie (DVD)	19.98
P005	Celebration (DVD)	12.00

Customers

CustID	CustName	CustEmail
C001	Nicky Singh	N.Singh@nesa.edu.au
C002	Casey He	C.He@bos.edu.au
C003	Ash Lee	A.Lee@bosnsw.edu
C004	Kim Smith	K.Smith@nesa.edu.au
C005	Pat Alvardo	P.Alvardo@bos.edu.au

Orders

OrderID	CustID	ProductID	OrderQuantity
T001	C001	P004	2
T002	C004	P005	1
T003	C002	P003	1
T004	C001	P002	2
T005	C005	P002	2

12 (a) The following SQL query is run to test the database. hide ^

```
SELECT ProductName, ProductPrice
FROM Products
WHERE ProductPrice > 22.00
ORDER BY ProductPrice ASC
```

Fill in the table below with the result of running the SQL query. You may not need to use all the rows or columns. (2 marks)

12 (b) The contents of the Orders table need to be displayed as follows. (3 marks)   Full screen   Run   Reset DB   hide ^

Customer	Product	Quantity
Nicky Singh	The Best Movie (DVD)	2
Kim Smith	Celebration (DVD)	1
Casey He	Travel 1 and 2 (Blu-Ray)	1
Nicky Singh	Discovery 1 and 2 (DVD)	2
Pat Alvardo	Discovery 1 and 2 (DVD)	2

Write a SQL query that can produce this result.

Query

1 |

No results to display

Question 13 (6 marks) Annotations

In a computer game, each player has 10 rounds and the maximum score for each round is 5. The score for each round is equal to the number of points, except when bonus points are assigned. Every time a player scores 5, the score from the next round is added as bonus points. If a player scores 5 in the last round, they get 10 points.

A player's scores and corresponding points for a full game are shown.

Round	1	2	3	4	5	6	7	8	9	10
Score	3	5	5	2	1	4	0	1	4	5
Points	3	10	7	2	1	4	0	1	4	10

Write a program in Python that will:
- **display the player's scores and corresponding points**
- **calculate and display the total points for the player, taking into account the bonuses.**

Start your program with: scores = [3,5,5,2,1,4,0,1,4,5]

The output of the program should match the following:

```
Round    Score    Points
1        3        3
2        5        10
3        5        7
4        2        2
5        1        1
6        4        4
7        0        0
8        1        1
9        4        4
10       5        10
TOTAL POINTS: 42
```
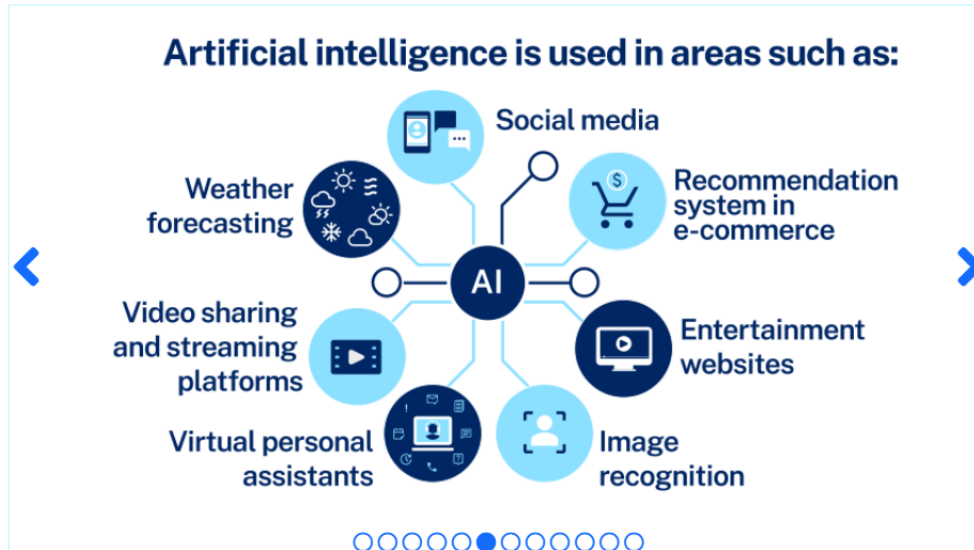
```
1  # Input code
2
```

Question 14 (8 marks)   Annotations

The following slideshow was prepared by a student as part of a research project.

Navigate the slideshow by clicking the forward and backward arrows. Clicking on the individual dots will take you to a particular slide.

Artificial intelligence is used in areas such as:

- Social media
- Recommendation system in e-commerce
- Weather forecasting
- AI
- Entertainment websites
- Video sharing and streaming platforms
- Virtual personal assistants
- Image recognition

14   Assess the use of artificial intelligence in our society. Support your answer with information from the slideshow. (8 marks)

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‹ Previous question   Exit exam ➔