Government of **Western Australia**
School Curriculum and Standards Authority

ATAR course examination, 2023

COMPUTER SCIENCE

SOURCE BOOKLET

Refer to the information that follows to answer Questions in Section Two of the Question/Answer booklet.

Refer to the information below to complete Question 21

A local movie theatre company has decided to employ you to create an online system, which will allow their customers to become members and then will enable members to order tickets for movies ahead of time, instead of having to go to the box office and purchase them on the day.

The movie theatre company has the following setup:

They have two locations.

Location one – has three cinemas

Cinema 1 –   has 26 rows with 20 seats per row
each seat is assigned an identifier through its row and seat
rows are from A–Z and seats are from 1–20
e.g. A1–A20 etc.

Cinema 2 –   has the same configuration as Cinema 1

Cinema 3 –   has 22 rows with 18 seats per row
each seat is assigned an identifier through its row and seat
rows are from A–V and seats are from 1–18

Location two – has four cinemas

Cinema 1 –   has 26 rows with 20 seats per row
each seat is assigned an identifier through its row and seat
rows are from A–Z and seats are from 1–20
e.g. A1–A20 etc.

Cinema 2 –   has the same configuration as Cinema 1

Cinema 3 –   has the same configuration as Cinemas 1 and 2

Cinema 4 –   a cinema with large recliners
has 6 rows with 8 seats per row
each seat is assigned an identifier through its row and seat
rows are from A–F and seats are from 1–8

Membership of the movie theatre company is open to the public. The company envisions the membership and reservation system involving the following.

Membership section

- To become a member, the public will go to www.movietheatrescsa.com.au. They will be invited to provide their first name, surname, date of birth, address, payment method details, email address and password. This information will be stored in the member database.
- Once the information has been saved, a verification email will be sent to authenticate their email address. After verification has been authenticated, the member will log on using their email address and password.
- The payment method details will be sent to the bank to be verified. Once verified, this information will be stored in the member database.

Reservation and ticket purchase section

- The member will search for movies from the theatre company's movies database, using a movie name or movie theatre location. Once the member has decided on the location and movie, they are prompted to choose the screening details. A seating plan showing available seats will be displayed from the cinema database and the member can then choose their seats. The seats will be blocked out in the seating plan and the cinema database updated.
- After submitting their choice, an invoice will be created with the details of the cinema location, movie, date, time and seats.
- The member will then check the details and the bank confirms payment. The tickets will be sent to the member via email. The transaction will then be saved in the bookings database.

Refer to the information below to complete Question 22 parts (a) to (e)

The movie theatre company has had a programmer create an algorithm for the new system whereby members can search for the movie they want to watch and make a booking.

The incomplete algorithm is shown below.

I.   # _____
     movies: array[0..9] of string = (*The Shawshank Redemption*, *The Godfather*, *The Dark Knight*, *Pulp Fiction*, *The Good, the Bad and the Ugly*, *12 Angry Men*, *Schindler's List*, *The Lord of the Rings: The Return of the King*, *The Matrix*, *Goodfellas*)

     selected_movie: string
     i: integer
     movieFound: boolean

II. # _____
     For i ← 0 to 9 do
         print(movies[i])
     EndFor

III. # _____
     input(selected_movie)

IV. # _____
     IF movieFound then
         print('You have selected 'selected_movie '.')
     else
         print('Sorry, that movie is not on the list.')
     EndIf

See next page

Refer to the information below to complete Question 22 parts (f) to (j)

The company has been asked to screen a film for a fundraiser. An algorithm has been created for this purpose. The incomplete algorithm is shown below.

Note: the member can choose to buy tickets, view the number of tickets sold, view the total sales from the fundraiser, or exit the program. The maximum number of tickets is 60, and the price of each ticket is $10. When a member buys tickets, the program checks whether there are enough tickets available and updates the number of tickets sold and total sales. The algorithm also checks whether all tickets have been sold and sets a flag to indicate that no more tickets are available. The member can view the number of tickets sold and the total sales raised for the fundraiser.

MAX_TICKETS ← 60;
TICKET_PRICE ← 10;
numTicketsSold: integer ← 0;
TotalSales: real ← 0;
TicketAvailable: boolean ← True;

Module PrintMenu()
        #Code to be completed: Menu displayed for Case choice in Main Module. The menu will be displayed with the 4 options for the user to choose – 1. Buy tickets 2. View number of tickets sold 3. View total sales and 4. Exit.
End Module,

Function BuyTicket(numTickets: integer): boolean
        #Code to be completed: Checks if the number of tickets are still available from the Maximum number of tickets. If the result is equal to or less than the maximum, add the number of tickets to the numTicketsSold. Then calculate the price of the tickets and add this to the TotalSales. Output a statement stating the cost of the tickets. If the result is more than the maximum, print a statement stating, 'All tickets are sold'.
End,

Module ViewTicketsSold(numTicketsSold)
        #Code to be completed: Displays the number of tickets sold
End Module,

Module ViewTotalSales(totalSales)
        #Code to be completed: Displays the total sales
End Module,

Main Module
        Repeat
                PrintMenu()
                Print('Enter your choice: ')
                Input(choice)
                        Case of choice '1':
                #Code to be completed: Input number of tickets required. Checks if there are tickets available. If not, display 'All tickets have been sold'. If tickets are available, then check if there are enough to purchase. If not, display 'There are not enough tickets available'. If there are enough to purchase, calculate the price of the tickets.
                        '2': ViewTicketsSold()
                        '3': ViewTotalSales()
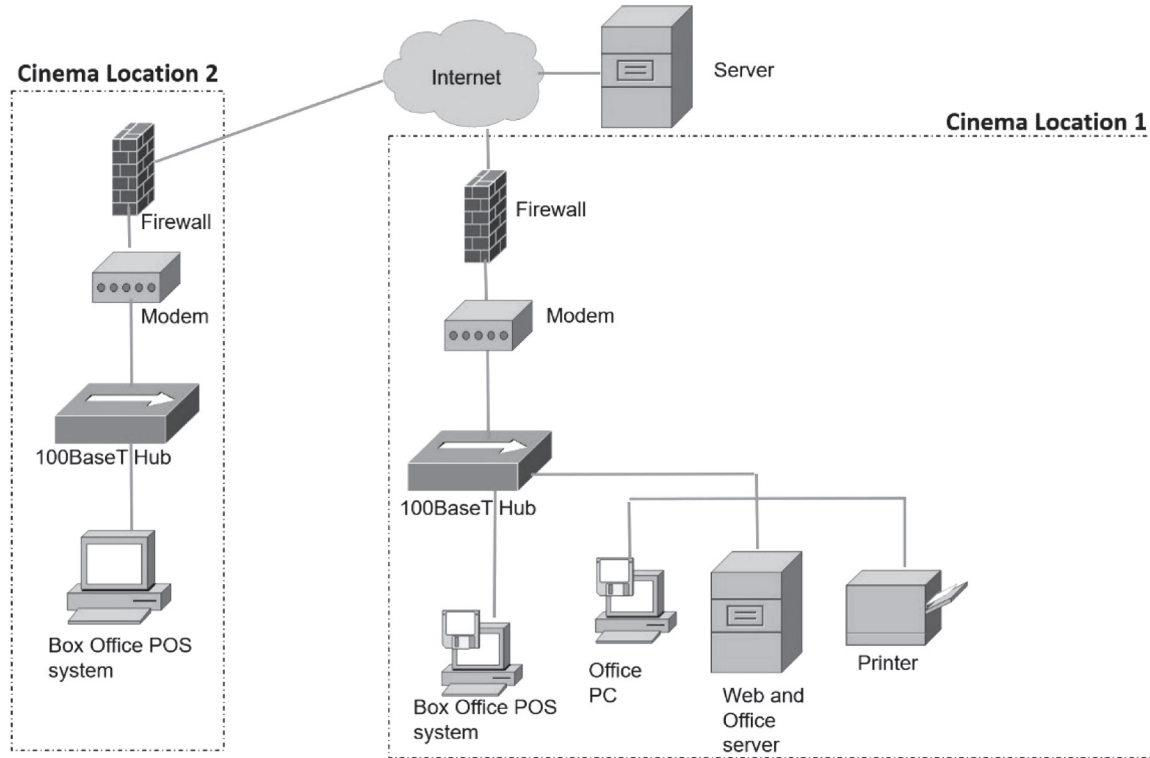   Until choice = '4'
End Module.

See next page

Refer to the information below to complete Question 23 part (e)

The cloud-based relational database for the membership and reservation system requires the following:

- each location has multiple cinemas
- one cinema has many seats
- one cinema has many screenings
- one movie has many screenings
- one member can make many bookings
- one screening can have many bookings
- one booking can reserve many seats
- one seat can have many bookings
- one screening can have many reserved seats.

Refer to the information below to complete Question 24

The current movie theatre company's network was designed when movies were projected from reels of film. It was designed to support the office and box office (ticket sales) point of sales (POS) systems.

End of Booklet