UTM
UNIVERSITI TEKNOLOGI MALAYSIA

MID-TERM ASSIGNMENT
SESSION 2019/2020, SEMESTER 2

SUBJECT CODE   : SCSJ 2203

SUBJECT NAME   : SOFTWARE ENGINEERING

YEAR/COURSE   : SCSJ/SCSV/SCSR/SCSB

TIME   : 2 DAYS

DATE   : 7th MAY 2020 – 8th MAY 2020

VENUE   : WORK FROM HOME

SECTION A :   MODULE 1   (15 MARKS)
SECTION B :   MODULE 2 AND 3   (15 MARKS)
SECTION C :   MODULE 4   (20 MARKS)
SECTION D :   MODULE 5   (50 MARKS)
TOTAL   :   100 MARKS

INSTRUCTION AND REMINDER

Answer all questions in this file. Note that any form of plagiarism will cause students to get zero in this assessment. Submit the assignment via e-Learning or as instructed by the course lecturer. This is an alternative assessment to replace mid-term exam that is not conducted due to the COVID-19 pandemic and Movement Control Order (MCO) since 18 March 2020. This individual assignment contributes 25% of the whole course assessments.

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Section	09
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This mid-term assignment consists of FIVE (6) pages excluding this page.

INSTRUCTION: Read and understand the given scenario and answer all questions

Due to the current COVID-19 pandemic in Malaysia, all sports activities either indoor or outdoor are suspend. Thus, society needs to find suitable alternatives in order to stay healthy and at the same time safety. Besides exercising and playing physical sports around the house, e-sports also become more trending nowadays. Even, our Ministry of Youth and Sports (KBS) also support this initiative by conducting several e-sports tournament during movement control order (MCO) period.

In order to promote this, KBS provides an online platform for Malaysia e-sports fans to know the update about any e-sports tournament held either state or national level. Since it become viral, KBS plans to extend the platform from static to dynamic platform called MYESPORTS where it can interact with the user (two ways communication) rather than just advertise purpose (one-way communication).

Assume that you are part of ICT team at KBS, your team are responsible to expand the system based on scope and requirement given.

No.	Roles	Description
1	Organiser	• Generate significant report. • Manage admin's profile. • Monitor admin's activities.
2	Admin	• Manage registration. • Manage payment. • Manage schedule.
3	Participant	• Register and pay the tournament fee online. • Receive relevance information, notification or documentation through e-mail. • Manage profile. • Track performance.

Section A: Introduction to Software Engineering (Module 1)   [15 marks]

Question A1

Based on the given scenario, you should choose **interactive transaction-based** type of software that is the most suitable to solve the problem. Should it be applied as a **generic or customized product**? Explain and justify the choice of application.

(5 marks)

The most suitable interactive transaction-based type of software that would solve the problem would be customized software product. This is because client software development is undertaken to create a software product according to the needs of the client in question. In this case, Malaysian e-sports fans. Besides that, This development does not need marketing, as it is designed for a suitable user group. In this type of product, the client decides the software development process. As KBS plans to interact with MYESPORTS users, the end-user requirements can be compiled throughout this development process through communicating by them.

Question A2

You need to concern both product and process quality focus when developing the proposed software. Choose **ONE (1) product quality** and **ONE (1) process quality** and explain how each quality should be applied by relating them with the given scenario and user requirements.

(10 marks)

The results of the product should meet its specification. Usability is very important as it refers to a user's perception of quality when dealing with products. Users should be able to easily adapt to the software. As an example, MYESPORTS users can easily acquire information on the status of any e-sports tournaments that will be taking place either at national or state level. Don't overlook the fact that e-sports fans consists of various ages. The product should be accessible for all ages. With that, maintainability should be applied as the software should be designed in such a way that it can adapt to meet client's changing needs. Maintainability is the point where a product allows its parts to be safe, quick and easy. It is reflected in product design. This is a vital attribute since a developing market environment eventually involves technological change. Who knows better on technological change if not e-sports fans. Maintainability will be done to satisfy all users of MYSPORTS user who are of various age groups.

Section B: Software Process Model and Agile Development (Module 2 & 3)   **[15 marks]**

Question B1

Choose the most suitable software process model and justify your choice.

(5 marks)

The most suitable software process model would be reuse-oriented software engineering as the existing product (MYESPORTS) is only needed to be upgraded from a static platform to a dynamic platform. Besides that, reuse-oriented software engineering process model is now the standard approach for developing most business structures.

Question B2

Based on the chosen software process model, schedule the development using **Gantt chart**. It should list the software processes that follow the software development life cycle (SDLC) and estimated number of days that meet the chosen software process model. Assume there are three expert software developers who will join the project and you are given only three weeks to complete the project as the stakeholders need to use the system urgently.

(10 marks)

TASKS	WEEK 1	WEEK 2	WEEK 3
Requirement Specification			
Component Analysis			
Requirement Modification			
System Design with Reuse			
Development and Integration			
System Validation			

Section C: Requirements Engineering (Module 4)   [20 marks]

Question C1

Write **FOUR (4) functional requirements** for the proposed system by employing the given template below.

> The <**user**> shall be able to <**capability**>

(16 marks)

1. Registration

   The participant shall be able to register and fill in their profiles online.

   The participants shall be able to create their significant user ID and password.

   Participants shall be able to receive information, notification or documentation through email.

2. Login

   The participants shall be able to login to the system by entering their significant user ID and password. Without the user ID and password, they will not be able to sign in to the system and pay for their tournament.

3. Future Tournaments

   The participant shall be able to 'view' and 'search' and the future tournaments that they would like to participate in.

4. Payment

   The participants shall be able to make payment for the tournaments that they want to participate in.

   The admin shall be able to check the payments of participants for each tournament.

Question C2

Write **ONE (1) non-functional requirement** for the proposed system by employing any of the given templates below.

> - The <**user**> shall be able to <**capability**> at a minimum rate of <**quantity**> times per <**time unit**>
> - The <**user**> shall be able to <**capability**> within <**quantity**> <**time unit**>s from <**event**>
> - The <**system function**> shall be able to <**action**> <**entity**> at least <**quantity**> times per <**time unit**>

(4 marks)

Availability

The participants shall be able to access the system at a minimum rate of 0 times per 24 hours as the system will be available at all times.
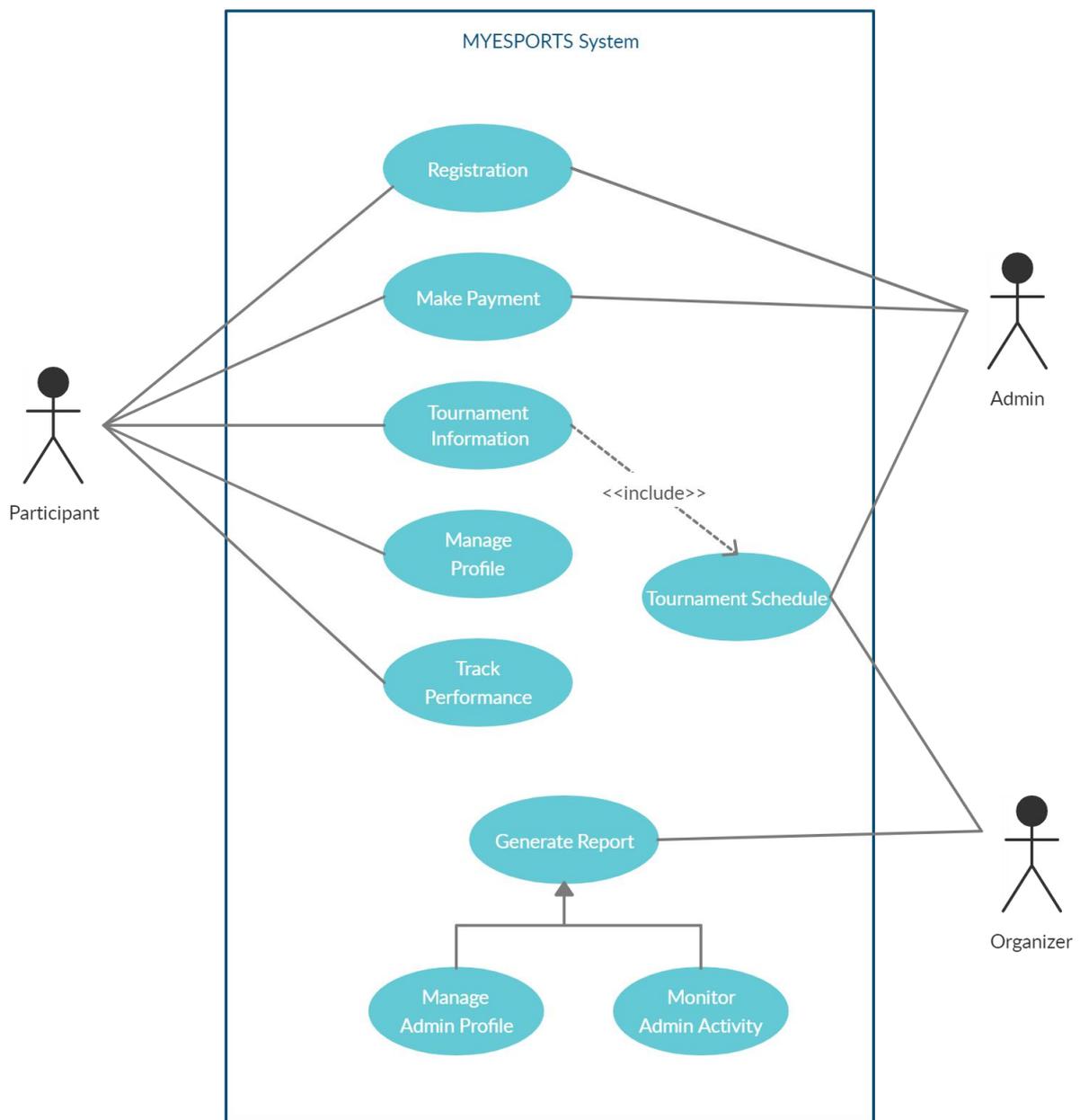
Section D: Requirements Analysis and Modelling (Module 5)   **[50 marks]**

Question D1

Draw a **use case diagram** based on the given scenario and identified functional requirements in Section C. You must include at least **FOUR (4) use cases**. Note that Login or Logout cannot be a use case.
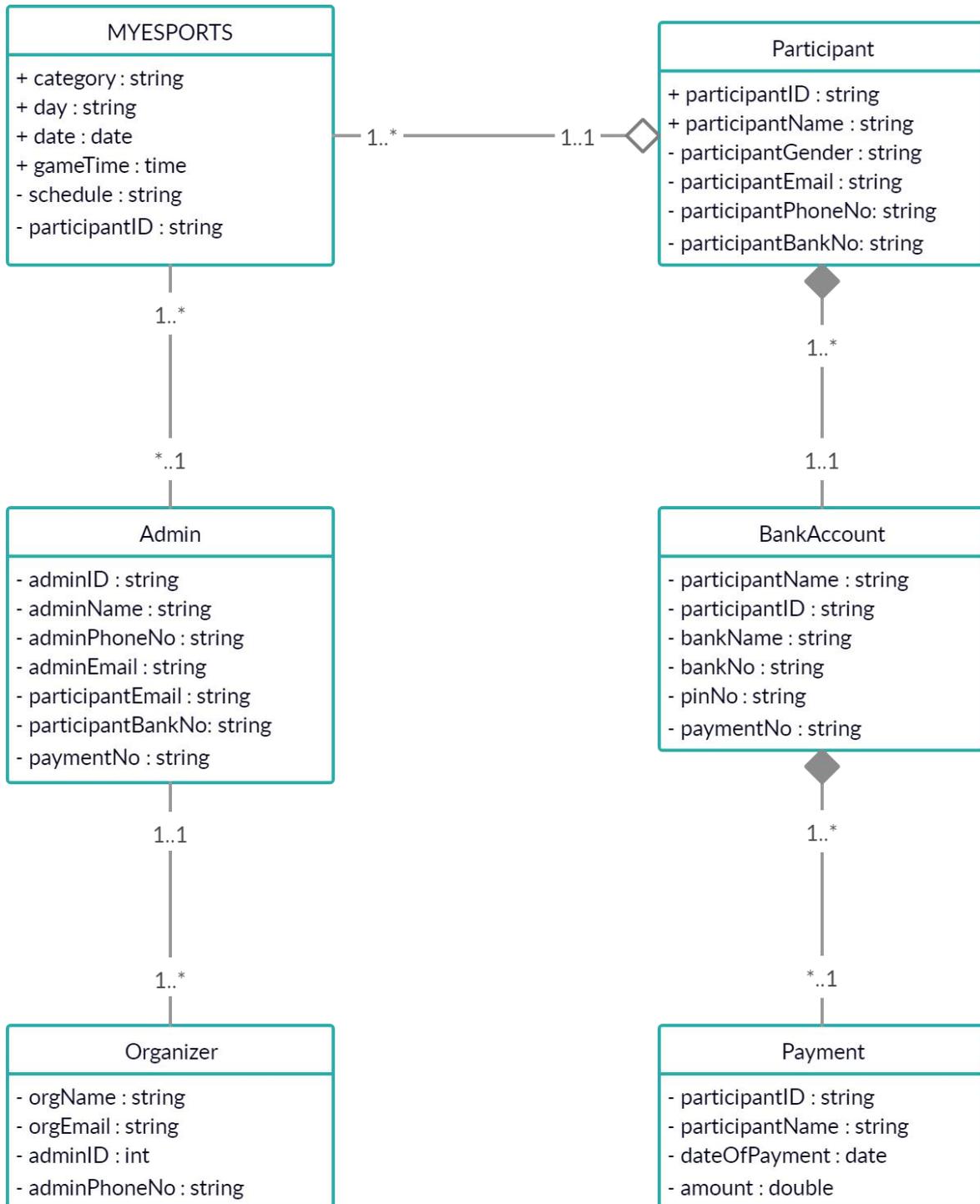
(10 marks)

Question D2

Draw a **domain model** (class diagram without method/operation) for the proposed system with suitable attributes and relationships. You should have at least **FOUR (4) classes**.

(10 marks)

```
┌─────────────────────────────┐                        ┌─────────────────────────────────────┐
│          MYESPORTS          │                        │             Participant             │
├─────────────────────────────┤                        ├─────────────────────────────────────┤
│ + category : string         │                        │ + participantID : string            │
│ + day : string              │                        │ + participantName : string          │
│ + date : date               │──1..*──────────1..1──◇ │ - participantGender : string         │
│ + gameTime : time           │                        │ - participantEmail : string         │
│ - schedule : string         │                        │ - participantPhoneNo: string        │
│ - participantID : string    │                        │ - participantBankNo: string         │
└─────────────────────────────┘                        └─────────────────────────────────────┘
            │                                                          ◆
           1..*                                                       1..*
            │                                                          │
           *..1                                                       1..1
┌─────────────────────────────┐                        ┌─────────────────────────────────────┐
│            Admin            │                        │             BankAccount             │
├─────────────────────────────┤                        ├─────────────────────────────────────┤
│ - adminID : string          │                        │ - participantName : string          │
│ - adminName : string        │                        │ - participantID : string            │
│ - adminPhoneNo : string     │                        │ - bankName : string                 │
│ - adminEmail : string       │                        │ - bankNo : string                   │
│ - participantEmail : string │                        │ - pinNo : string                    │
│ - participantBankNo: string │                        │ - paymentNo : string                │
│ - paymentNo : string        │                        └─────────────────────────────────────┘
└─────────────────────────────┘                                        ◆
            │                                                          1..*
           1..1                                                        │
            │                                                         *..1
           1..*
┌─────────────────────────────┐                        ┌─────────────────────────────────────┐
│          Organizer          │                        │              Payment                │
├─────────────────────────────┤                        ├─────────────────────────────────────┤
│ - orgName : string          │                        │ - participantID : string            │
│ - orgEmail : string         │                        │ - participantName : string          │
│ - adminID : int             │                        │ - dateOfPayment : date              │
│ - adminPhoneNo : string     │                        │ - amount : double                   │
└─────────────────────────────┘                        └─────────────────────────────────────┘
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Question D3

Choose **ONE (1) use case** from the use case diagram in Question D1 and illustrate the **use case description** using the template below. You should choose the scenario that involves at least **TWO (2) entities.** Any alternative flows are not required to be included.
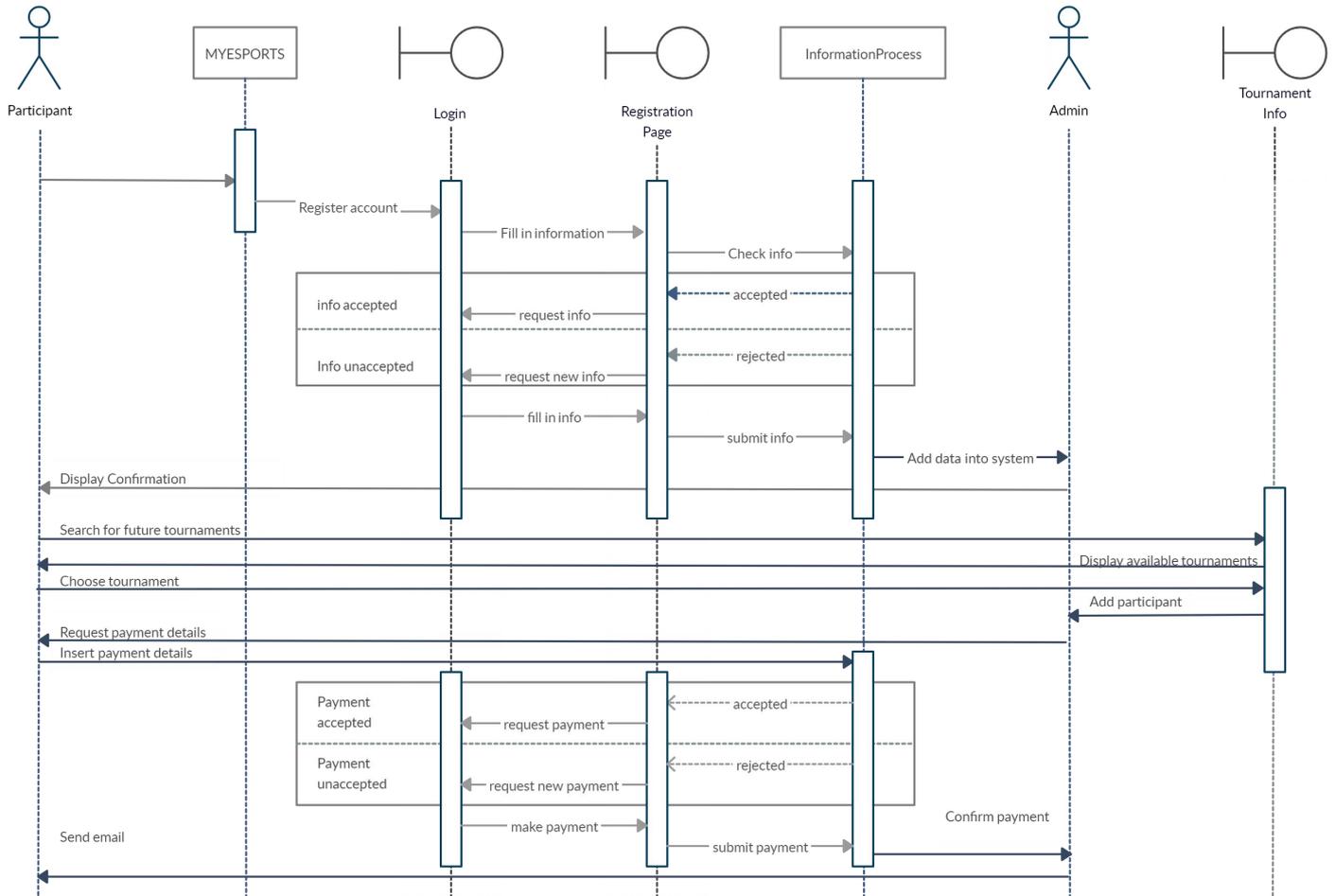
(10 marks)

Use case: Make Payment
ID: Payment
Actors: Participant   : Admin
Preconditions: MYESPORTS bank account must exist Participant bank account must exist MYESPORTS must exist
Flow of events: 1. Participant must register for the first time only 2. System will display registration page 3. Participants must fill in the registration form 4. System will accept and keep all participant information 5. Participants must search for future tournaments 6. The system will then display the information of future tournaments 7. Participant must choose which tournament 8. The system will display the payment details form 9. Participant must enter payment information 10. System will confirm payment 11. System will send relevant information, notifications or documentation through email
Postconditions: Payment must be made to MYESPORTS with Participant Bank No

Question D4

Draw a **sequence diagram** for the scenario based on the use case description in Question D3.The diagram should include at least **ONE (1) boundary** and **TWO (2) entities** (objects) interacting with the corresponding actor. State the messages clearly.

(10 marks)

Question D5

Illustrate the **activity diagram** for the same scenario in Question D4. Include the swimlanes.

(10 marks)

Participants	MYESPORTS System	Admin