

SULIT



**MID-TERM EXAMINATION
SESSION 2017/2018, SEMESTER 2**

SUBJECT CODE : SCSJ 2203
SUBJECT NAME : SOFTWARE ENGINEERING
YEAR/COURSE : SCSJ/SCSV/SCSR/SCSB
TIME : 2 HOURS AND 30 MINUTES
DATE : 4th MAY 2018
VENUE : BK 1 – 7, N28

SECTION A :	20 TRUE/FALSE QUESTIONS	(20 MARKS)
SECTION B :	4 STRUCTURED QUESTIONS	(40 MARKS)
SECTION C :	1 ESSAY QUESTION	(40 MARKS)
TOTAL :		100 MARKS

INSTRUCTION

Answer all questions in the answer booklet.

Name	
IC No. / Matric No.	
Year / Programme	
Section	
Lecturer Name	

This mid-term exam paper consists of EIGHT (8) pages excluding this page.

SECTION A: TRUE/FALSE QUESTIONS**[20 MARKS]**

Instruction: For each statement, determine whether it is **TRUE [T]** or **FALSE [F]**.

No.	Statement
1.	Software engineering is an engineering discipline which concerns in programming the application.
2.	Operating system components, compilers and editors are examples of system software applications.
3.	Computer science focuses on theory and fundamentals in hardware and software while software engineering is concerned with the practicalities of developing and delivering useful software.
4.	All software qualities are important and all of them should be focused or considered during the software development process.
5.	Maintainability quality is one of the internal qualities concerned in determining there is no wasteful use of system resources such as memory and processor cycles.
6.	With the use of waterfall model, the cost of dealing with changing requirements can be reduced.
7.	Both Spiral and RUP process models have risk analysis in its software development phase.
8.	Reuse oriented software engineering promotes reuse by using components such as web service in the software development.
9.	Prototype is one of the ways to promote change avoidance in software process.
10.	Change tolerance is where the software process is designed so that the software process can anticipate possible changes before significant work is required.
11.	Agile development is developed as a series of versions or increments with stakeholders involved in version specification and evaluation.
12.	Agile methods focus on the design rather than the code.
13.	Renaming attributes to make code easier to understand is one of the examples of refactoring.
14.	At the end of the sprint, the work done is reviewed and presented to Scrum Master and the next sprint cycle then begins.

No.	Statement
15.	Agile methods are most appropriate for software maintenance rather than new software development.
16.	System requirements is prepared for several readers, among which, the system architects, system end users and client managers.
17.	Regulatory requirement and ethical requirement are two types of external non-functional requirements.
18.	The statement “ <i>The U-Smart system must be delivered by 31st March 2018; and should not cost more than RM15000.</i> ” is an example of an external non-functional requirement.
19.	The statement “ <i>When a book becomes overdue, system shall display appropriate information.</i> ” is an example of a functional requirement.
20.	Requirement review is a requirement validation technique that uses prototype to validate the requirement.

SECTION B: STRUCTURED QUESTIONS

[40 MARKS]

Instruction: Answer **ALL** questions.

Question 1

[10 marks]

- (a) Describe TWO (2) sources of software complexity that may lead to the problems in a large software projects development as shown in Figure 1.

(3 marks)

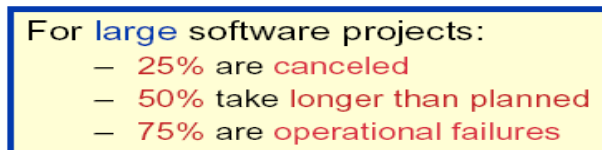


Figure 1

- (b) Your development team is assigned to develop a Medical Healthcare Patient Management System (MHCPMS). Users of the system include clinical staff (doctors, nurses, health visitors), receptionists who make appointments and medical records staff. The health authority has a number of clinics that patients may attend in different hospitals and in local health centres.

- (i) State the application domain for MHCPMS. Discuss TWO (2) inherent difficulties that will be faced by your development team for developing software in this domain.

(5 marks)

- (ii) Identify TWO (2) qualities that should be in the software to be developed and justify why the qualities are important.

(2 marks)

Question 2

[10 marks]

- (a) Describe ONE (1) importance of software process models in software development.
(1 mark)
- (b) Suggest the most appropriate generic software process model (waterfall model, incremental development model or reuse-oriented software engineering model) for each of the following software development and justify your answer.
- (i) A human resource management system that is integrated with a leave and attendance system where the stakeholders are clear with their requirements.
(3 marks)
- (ii) An online music store application which focus on selling audio files over the Internet. The functionality can be added incrementally to the application by offering a newer version of its application in Google Play Store.
(3 marks)
- (iii) An inventory management system is replacing existing standalone database to a cloud database. However, the system functionalities will remain and no changes will affect the system business process.
(3 marks)

Question 3**[10 marks]**

- (a) You and your team mates are assigned to a new project of Johor Intelligent Transportation System (JITS) that will use an Agile methodology. Methodology should be selected based on its suitability for the organization and its project.

Describe TWO (2) criteria to be considered for selecting agile methodology.

(4 marks)

- (b) You have been appointed as a Scrum Master for the project of JITS that will use Scrum as an agile development technique.

Describe THREE (3) responsibilities of Scrum Master during software development for this project.

(3 marks)

- (c) As a Scrum Master, the starting point for planning is a product backlog, which is the list of work to be done on the project. Suggest THREE (3) benefits of the task board for each sprint as shown in Figure 2.

(3 marks)

Story	To Do	In Progress	Done
Story A		Task	Task
Story B	Task	Task	Task
Story C		Task	Task

Figure 2

Question 4**[10 marks]**

- (a) You are about to conduct a requirement elicitation and analysis process. Describe the stages involved in conducting the process.

(4 marks)

- (b) Given the following requirement statements for a system that allows its users to perform files upload. These requirement statements are AMBIGUOUS. Discuss why they are ambiguous. Rewrite the statements to remove the ambiguity.

Users can upload large file by using the UPLOAD function available in the system. Upload will fail if the file is invalid.

(4 marks)

- (c) Ethnography is one of the technique in capturing requirement. Describe what ethnography is.

(2 marks)

SECTION C: ESSAY QUESTION

[40 MARKS]

Instruction: Read and understand the given scenario and answer all questions.

Afiat Clinic is considering to have an online Clinic Appointment System (CAS). The users of CAS include patients, doctors and management personnel. Doctors record their availability then the management produces the schedule. Both doctors and management personnel can also manage schedule. Patients can make appointments based on the schedule. Every time a patient makes an appointment, the patient is asked to verify payment arrangements. However, occasionally it is necessary to actually make new payment arrangements.

- (a) Draw a **use case diagram** based on the information above.

(10 marks)

- (b) When patients make appointments, two main activities are get patient info and manage appointments. For a new patient, the system should create the new patient record before managing the appointments. Otherwise, the patient can proceed directly with managing appointments. In addition, manage appointments activity could be either to create a new appointment, cancel an existing appointment or change an existing appointment before patients can end the whole process.

Create an **activity diagram** based on the given activities.

(10 marks)

- (c) CAS consists of a person record that could be a patient or Afiat Clinic employees with staff ID who are either management personnel or doctor. The details of a person includes identity card number, name, address and phone number. Doctors are differentiated from management personnel by their specialist. Patient record includes amount and insurance carrier status. When patients make appointments, CAS shall record time, date and reason of the appointment. Payment record with date and amount details is created once a patient has been registered to CAS.

Draw a **domain model** (class diagram without method/operation) for CAS with suitable relationships based on the given details.

(10 marks)

- (d) For each new patient registration, CAS accepts those with or without insurance carrier status. However, the registered patient must have at least one medical insurance within three weeks. Failure to have one, the patient will be deleted from CAS as the online appointment is dedicated for patients with insurance.

Based on the description, create a **state chart diagram** for the patient.

(4 marks)

- (e) A registered patient needs to login and then search the existing appointment list for the following days (more than 24 hours) before he or she can cancel an appointment. An appointment can only be cancelled at least one day before the appointment date.

Draw a **sequence diagram** for the given scenario. Do not include alternative flow.

(6 marks)