

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)**ORGANISATION OF ISLAMIC COOPERATION (OIC)****Department of Computer Science and Engineering (CSE)****MID SEMESTER EXAMINATION****SUMMER SEMESTER, 2016-2017****DURATION: 1 Hour 30 Minutes****FULL MARKS: 75****CSE 4601: Software Engineering and Object Oriented Design****Programmable calculators are not allowed. Do not write anything on the question paper.****There are 4 (four) questions. Answer any 3 (three) of them.****Figures in the right margin indicate marks.**

-
1. a) "Don't reinvent the wheel" – How does the principle of software engineering help in software development? 5
 - b) Briefly describe the Waterfall software process model. State its advantages and disadvantages. 10
 - c) Define Software Requirement Specification (SRS)? What information does SRS contain? 4
 - d) What is 80-20 rule? How does it help in software engineering? 6

 2. a) One of the anti-patterns that prohibit code reuse is copy-paste programming. An example of copy-paste programming is given in the code snippet below. Refactor the code with explanations. 4


```
class Controller{
int logic1(Student s){
int a=s.age;
int b=s.some_parameter;
//logic
int c=a+b;
return c;
}
```

```
int logic1(Person p){
int a=p.my_age;
int b=s.advantage_factor;
//logic
int c=a+b;
return c;
}
} // class Controller
```
 - b) Define domain classes. Find the domain classes of a typical information system. Does project scope play any role in finding domain classes? If yes, how? 10
 - c) What is a Façade? How does façade help in layering and abstraction in software modeling? Can you quote an example of the use of a façade in real software project? 7
 - d) "Process is the layer that glues all other layers of activities together"- Explain briefly. 4

 3. a) What is use case? Elaborate the use case of buying a product from an e-commerce site. 10
 - b) Write down the general characteristics of agile process. 5
 - c) Suppose you are to develop a keyboard application that may use EEG signal based Brain Computer Interaction (BCI) or an Eye pointer (image processing based) for impaired people. Both BCI or image processing mechanism will help the impaired person to choose a character and eventually a word using the keyboard. As the mechanisms are slow, there is a need to develop letter prediction tool and a word prediction tool embedded within the keyboard application. As you are new to the development of special keyboard applications, you will need to do some research on BCI or Eye pointer though there are few APIs available. Write an iteration plan of your development if you following SCRUM agile development process. 10

4. a) The first four principles of planning are:
- i. Understand the scope of the project
 - ii. Always involve customer in the planning activity
 - iii. Recognize that planning is iterative
 - iv. Estimate based on what you know.

8

Describe one of your real project development experiences where you could use the above principles.

- b) Mini Football in IUT is a miniature version of the usual Football game where 6 players play in each team instead of 11 in the actual games. The match is played in a smaller area of 50 yards by 20 yards. The distribution of players in each team is like: 1 goalkeeper, 2 defenders, 2 midfielders and 1 striker. The rules are same. Players pass and kick the ball in order to score goals. Team that scores more goals wins the game. The defenders try to stop the opposing players from scoring goals. The Goalkeeper is the last line of defense, blocking opposition shots. The game lasts 40 minutes, divided into 2 halves of 20 minutes each.

10

Use this information to come up with an initial Class Diagram for modeling the *game of mini football in IUT*. If Object Diagram helps particularly in describing a system instance, you are encouraged to draw an Object Diagram also.

- c) Briefly describe the MVC pattern.

7