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MALAYSIA INSTITUTE OF INFORMATION TECHNOLOGY

FINAL EXAMINATION
JANUARY   2016 SEMESTER

SUBJECT CODE	:	ISB23303
SUBJECT TITLE	:	SOFTWARE DESIGN
LEVEL	:	BACHELOR
TIME / DURATION	:	(2 ½ HOURS) 9.00 am – 11.30 am
DATE	:	26 MAY 2016

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.

2. This question paper is printed on both sides of the paper.

3. This question paper consists of ONE (1) Section. Section A.

4. Answer ALL questions.

5. Please write your answers on the answer booklet provided.

THERE ARE 6 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A(Total:100 marks)

INSTRUCTION: Answer ALL questions.

Please use the answer booklet provided.

Question 1

(a)   Define the following terms: (6 marks)

      i.   Robustness and Correctness

      ii.   Self Service business pattern and Collaboration business pattern

      iii.   Model and Patterns

(b)   Software Process is a procedure followed by the development team to   (4 marks)
produce an application.

      i.   *CommandLineCalculator* begins by asking the user how many
accounts he wants to open. It then establishes the desired
number, each with zero balance.

      ii.   *CommandLineCalculator* asks the user which of these accounts
he wants to deal with.

      iii.   When the user has selected an account, *CommandLineCalculator*
allows the user to add whole numbers of dollars to, or subtract
them from the account for as long as he requires.

      iv.   When the user is done with an account, he is permitted to quit, or
to pick another account to process.

Based on the requirement above, discuss what mistakes caused by the
user that will make a system crashes.

(c)   Maintenance is a final phase in the software process. It is regarded as a   (6 marks)
continuous process and can only be done after the software is released.
Describe two (2) activities involved in this phase and discuss how the
quality of design affects the software maintenance cost.

(d) In software design, requirements elicitation and analysis is a systematic approach of capturing client requirements, analyzing them and documenting the problem domain before the development. State two (2) categories of requirements.   (4 marks)

Question 2

(a) Based on interface below, write the method that is triggered when the buttons reset and exit are pressed.   (4 marks)

(b) Why do you think iteration is important for design?   (4 marks)

(c) Design patterns are well-proved solution for solving the specific problem/task. As a system engineer, when should we use the design patterns and describe two (2) advantages for using design pattern in development.   (6 marks)

(d) Model view controller (MVC) is a software architectural pattern for implementing user interfaces on computers. The MVC structure was used repeatedly as an example in software design since it illustrates many useful design patterns. Discuss three (3) major components of MVC.   (6 marks)

Question 3

(a) The visibility to end user is an important issue when managing an   (2 marks)
     enterprise application category. Discuss with an example what Upstream
     enterprise applications are.

(b) A Facade Pattern concept is providing a unified and simplified interface   (8 marks)
     to a set of interfaces in a subsystem; therefore it hides the complexities of
     the subsystem from the client.
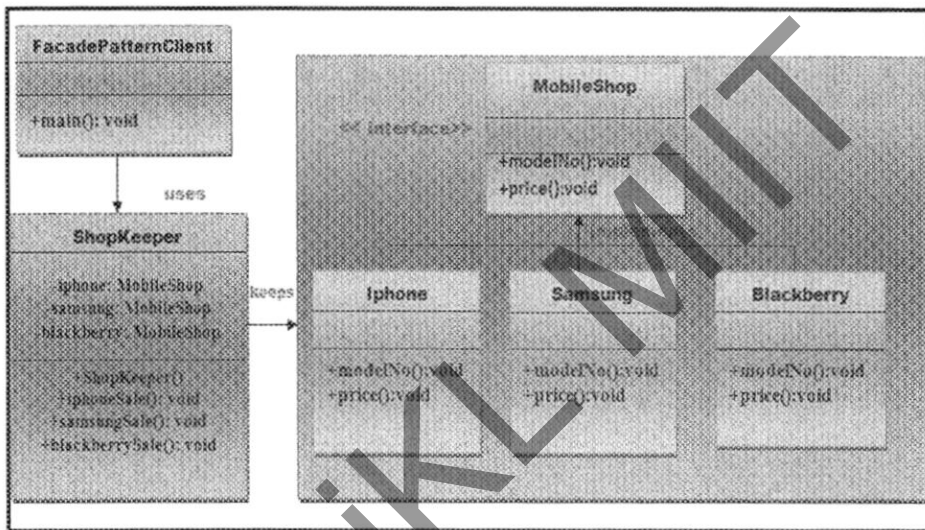
Class diagram 1

Based on class diagram 1, Create a MobileShop interface, Create a
Iphone implementation class that will implement Mobileshop interface
and Create a ShopKeeper concrete class that will use MobileShop
interface.

(c) Diagram 2 below shows the process of customer placing an order for a   (2 marks)
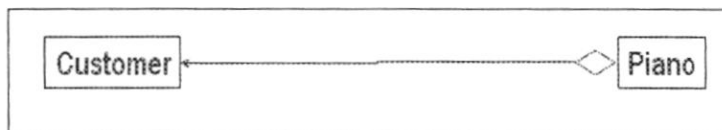   new piano.

Diagram 2

Based on the diagram to reduce dependency among classes, designer

need a design that can easily accommodate the changes. Draw a new flexible design from the current design.

(d) Based on UML given (diagram 3), discuss the specification that developer need to consider when applying the adapter pattern.   (8 marks)
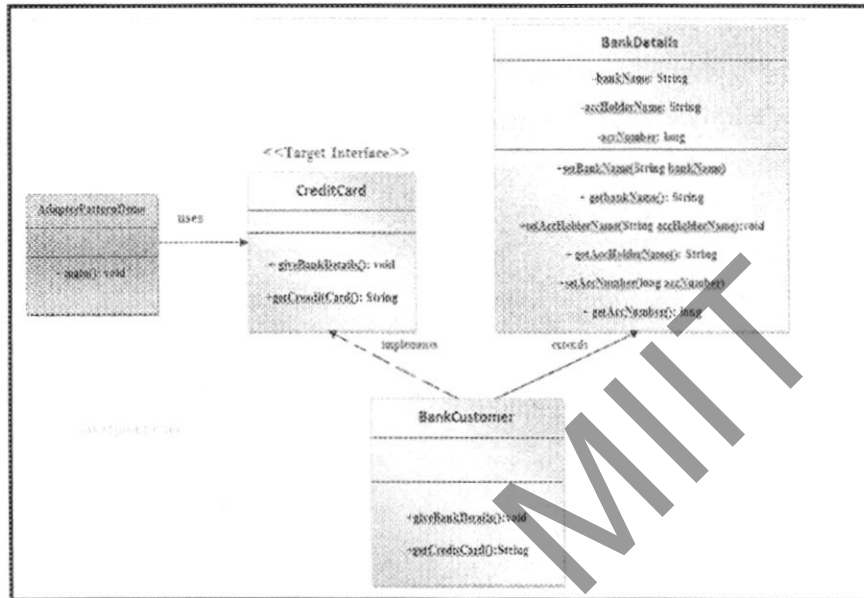

Diagram 3

Question 4

(a) To create the singleton class, we need to use special features to implement it. Based on this information, explain the functionality of this feature.   (6 marks)

(b) List two (2) design pattern forms and explain which one of this two design pattern is linked list of object.   (2 marks)

(c) This is a problem about design patterns. Write down the name of the design pattern with the advantage of it.   (8 marks)

    i. Consider a situation where there is multiple database call to extract huge size image. The real object gets created only when a

client first requests/accesses the object and after that we can just refer to the surrogate to reuse the object. This avoids duplication of the object and hence saving memory.

ii.   Build an application that estimates the able to provide an interface for creating families of related objects, without specifying concrete classes. This pattern is found in the sheet metal stamping equipment used in the manufacture of Japanese automobiles. The same machinery is used to stamp right hand doors, left hand doors, right front fenders, left front fenders, hoods, etc. for different models of cars. Through the use of rollers to change the stamping dies, the concrete classes produced by the machinery can be changed within three minutes.

iii. Suppose we have a list of radio channels and the client program want to traverse through them one by one or based on the type of channel, for example some client programs are only interested in English channels and want to process only them, they don't want to process other types of channels.

iv.   Customers fill out an order form on a web site, and then hit the "enter" button. The result must depend upon the state of the form data: "Product Information complete", "Personal Information Incomplete," and "Credit check In progress".

(d)   Imagine your surprise for this birthday when, instead of traditional presents under the tree, you find boxes with labels and handles. When you pull a handle a present comes out. The present is unique but it matches the category label on the box. Some boxes are labeled with age ranges. These boxes will produce different types of presents, but they all match the age range. The boxes represent two design patterns: Factory Method and Abstract Factory. Give an evident to support this scene.   (4 marks)

Question 5

(a) The architecture description of an enterprise application consists of various aspects. These aspects are depicted by various views and, in turn, each view is represented as one or more appropriate models using languages like UML. The architecture serves as the blueprint for guiding the design of an application or a product. Based on this information, differentiate the meaning of form of 'views' and 'viewpoints'.

(4 marks)

(b) An enterprise architecture framework specifies a set of views and viewpoints and comprises of principles, standards, guidelines, approaches, services, design concepts and models to facilitate the development of enterprise architecture. TOGAF (The Open Group Architecture Framework) is one of the most popular enterprise architecture frameworks. Describe two (2) domains architecture involves in TOGAF.

(4 marks)

(c) Model Driven Architecture (MDA) provides a framework for software development that Standardization effort driven by the Object Management Group (OMG). Briefly discuss benefits of applying MDA for the development.

(6 marks)

(d) Enterprise Application Integration (EAI) is the creation of new strategic business solutions by combining the functionality of an enterprise's existing applications, commercial packaged applications and new code using a common middleware. Discuss three (3) types of EAI model.

(6 marks)

END OF QUESTION