

KIBABII UNIVERSITY COLLEGE

SCHOOL OF COMPUTING & INFORMATICS

UNIVERSITY EXAMINATION 2012/2013

MIT 820: ARCHITECTURES FOR SOFTWARE SYSTEMS AND EMERGING ISSUES

Instructions: Section A: (Q1 Compulsory containing 30 Marks)

Section B: (Q2-Q5 Attempt any 2 questions containing 20 marks each)

Section A: (Q1 Compulsory containing 30 Marks)

Question One

- a) components and connectors constitute the basic elements of software architecture
 - a) what is a component [2 marks]
 - b) what is a connector [2 marks]
- b) When getting started with your design, it is important to keep in mind the key principles that will help you to create an architecture that adheres to proven principles, minimizes costs and maintenance requirements, and promotes usability and extendibility. Identify and explain The FIVE key principles that you need to consider. [5 marks]
- c) Discuss with the aid of examples THREE uses of software architecture [6 marks]
- d) Software architecture is an emerging discipline within software engineering limitations. Discuss the TWO main limitations of Software architecture [6 marks]
- e) Identify the issues addressed by the process view of a software architecture [3 Marks]
- f) Consider a trading system, where trading decisions are based on information collected from three different sources: a stock ticker, an index watcher, and a CNNNewsFeed. Information from the stock ticker and the index watcher are first analyzed and then forwarded to the trading manager via an alert manager. The CNNNewsFeed communicates directly with the Trading manager. Provide an interaction diagram for this system. [6 marks]

Section B: (Q2-Q5 Attempt any 2 questions containing 15 marks each)

Question Two

- a) What is a distributed architecture [3 marks]
- b) Explain the key challenges involved in designing, implementing and operating a distributed system [5 marks]
- c) With aid of a diagram explain how the CORBA architecture works [7 marks]

Question Three

- a) What is a pattern in software architecture context? [2 marks]
- b) Identify and explain with the relevant example the THREE kind of patterns in software architecture [6 marks]
- c) You are building a quote application, which contains a class that is responsible for managing all of the quotes in the system. It is important that all quotes interact with one and only one instance of this class. Explain how you may structure your design so that only one instance of this class is accessible within the application hence provide a java code for the structure [7marks]

Question Four

- a) With aid of a diagram illustrate how the software architecture fits within the software development life cycle clearly indicating the key inputs to and outputs from the architectural design. [8 marks]

b) With aid of an example provide a standard schema of describing an architectural pattern
[7 marks]

Question Five

You are required to modularize the user interface functionality of a Web application so that you can easily modify the individual parts.

Outline the forces that act on a system within this context and must be reconciled as you consider a solution to the problem:
[15 marks]