Scenario

You are a successful software development consultant in a large consulting firm (e.g. Deloitte, EY, KPMG, PWC, Boston Consulting Group). Given your success as a knowledgeable and creative software development professional, your portfolio of clients has grown to include a diverse range of organisations. These include large multi-national companies and government agencies through to small to medium sized enterprises (SMEs).

Part A Short Answer Questions (45 marks)

Part A includes 9 questions. You should attempt all the questions (5 marks for each question).

A1. One of your clients is a ride-sharing company that concentrates exclusively on ride-sharing for scooters. They require a short briefing on how to automate acceptance testing for their ride-share application. As part of the short briefing you must briefly describe acceptance testing in terms of its aim and criteria and describe at least one framework suitable for automation of acceptance testing for this application.

A2. You have university as a client. The following shows their *university graduate internships directory*. Develop a brief *black-box* test plan for this interface from a purely functional point of view using strategies you have learned about or any you can think of. You can assume the "SEARCH" buttons are designed to use the *field* above them in a search operation. Do not forget the top of the page where you can assume that each category (e.g. interns, internships, companies) is a hyperlink.

A3. You have landed a new software client that develops malware-detection software and they have asked for your advice on software testing. They have asked you which of alpha or beta testing is appropriate for testing malware-detection programs and why? Respond.

A4. You have a client who is a one-person operation. The individual is a brilliant programmer but has a reputation as a loner who does not seek advice. As such, they have been asked by their key investors to consult your firm on some aspects of configuration management. The client develops software applications that are eventually sold on app store destinations. Explain why
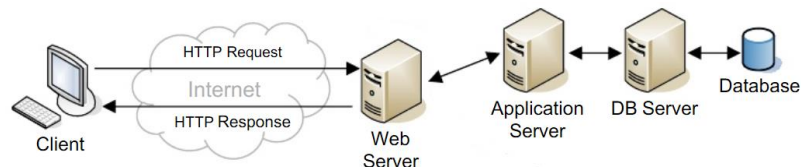
configuration management may **not** be necessary for applications that are designed by individuals for such a destination.

A5. You have a banking client that has been in operation for over 150 years. In the development of a new banking app, they are considering implementing 'nightlies' as part of their system build processes. Provide some cautionary advice as to why such processes may be a challenge for this specific client.

A6. A software development company in Melbourne will develop a customer relationship management system for SCU in 1.5 years, using Scrum process management methodology. Describe and explain possible difficulties/problems that may occur during the development process.

A7. You have a large engineering company as a client and their software development team have informed you that they are intending to implement test-driven (or test-first) development. Describe possible obstacles to the implementation of TDD for this client.

A8. Translate the following statements from natural language to C# XML comments:

    a. The parameter `args` are not used.
    b. Returned is a URL.
    c. See also `TestClass.Main`.

A9. A manufacturing company has its suppliers and wholesalers. A software system is needed for their supply chain management. Recommend a distributed architecture for the industry chain management system and explain why your recommendation is appropriate.

Part B Essay Style Questions (55 marks)

*Part B includes 5 questions. You must choose **only** 5 questions from the questions available.*
If you answer more than 5 questions only the first 5 questions will be accepted.

B1. You have a client who is a major e-commerce player in Asia (business-to-consumers) and their e-commerce website is a traditional multi-tier client/server system, which is illustrated in the following figure. Their site crashed on the night of 11/11/2019, which was an annual shopping festival, because of insufficient capability to process a huge amount of purchase transactions in a short period of time.

They have asked you for advice to avoid this problem in the future. Provide two solution options of **distributed systems**. Discuss the options in terms of their advantages and disadvantages in the context of the client's website, and determine which of the two solutions you would recommend to extend the company based on your discussion. [11 marks]

B2. A university client has a system that uses the following program:

```
public char grade(int mark){…}
```

accepts a mark from 0 to 100 and outputs a grade of F or P according to the grading rule:
- grade = F if $0 \le mark \le 49$;
- grade = P if $50 \le mark \le 100$.

Describe **test cases** and determine test cases for the program. Also explain if this testing is black-box testing, unit testing, component testing, system testing, release testing, and/or user testing. [11 marks]

B3. The manager of your team wants a one pager document that she can use for any client who is seeking some quick information on software changes and configuration management. Describe **software changes** with respect to configuration management, and explain the types of software changes in software maintenance in terms of their reasons. You should provide examples in your explanation. [11 marks]

B4. The manager of your team also wants a one pager document that she can use for any client who is seeking some quick information on **system vision documents.** Describe this document in software procurement, and determine and describe the following:
- The aim of the document.
- The audience of the document.
- The information needs of the audience.

- The presentation of the document with respect to language and document style.
[11 marks]

B5. Your university client has asked for your advice on one of their systems. Once a student user has been enrolled in one or more units, their information as a student would be included in a relevant university database. During the study session, the student can access a MyStudent Hub with their student account. The following is part of the MySCU Hub page for you.

Welcome [student name]
It's Week 11 of Session 1 and Week 3 of Study Period 3.

Useful Links	Current Site List
Email	**2020 Session 1**
MyEnrolment	Managing Software Development Projects
Timetables	[other units]

Describe **user stories** in XP (Extreme Programming), and write a user story to describe the task/requirement of generating the above part of the MyStudent Hub page. [10 marks]

B6. Describe and explain **Web services**, and describe the significance of the coordination services in SOA (service-oriented architecture) systems to your client, Spearhead technology Services (STS). As this client develops Internet of Things (IoT) products, your advice must be relevant to IoT. [11 marks]

Part C Online exam check (Pass/Fail)

To be arranged