

<i>Number of pages</i>	2
<i>Number of questions</i>	4



**UNIVERSITY OF SRI JAYEWARDENEPURA**  
**Faculty of Technology**

**Bachelor of Biosystems Technology Honours Degree**  
**Bachelor of Engineering Technology Honours Degree**

**Fourth Year Second Semester End Examination**

**May 2023**

**BTC 4251 / ETC4271: Entrepreneurship and Small Business Management**

**Time: One (01) Hour**

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**Read and follow the instructions given below:**

- This paper contains four (04) questions on two (02) pages, including this sheet.
- Answer all questions.
- This is a **closed-book examination**.
- The marks assigned for each question are included in brackets.
- “**Index number**” and course code “**BTC4251**” or “**ETC4271**” should be written on top of each page of the answer script, and pages must be **numbered appropriately**.
- Start each question on a new page.
- Draw clearly labelled diagrams wherever necessary.
- If you have any doubts as to the interpretation of the wording of a question, make your own assumptions, but clearly state them on the answer script.

**Question 1** **(Total Marks 25)**

a). “Opportunities are like sunrises. If you wait too long, you miss them.” **Briefly explain** four (04) essential qualities of business opportunities with examples. **(10 Marks)**

b). Suppose you plan to start a business relevant to your focus area. Based on the six (06) steps in the entrepreneurial process **briefly discuss** how you are going to establish the business successfully in the market. **(15 Marks)**

**Question 2** **(Total Marks 25)**

a). “Feasibility analysis is the process of determining whether a business idea is viable.” **Evaluate** four (04) main components of feasibility analysis with their subcomponents. **(12 Marks)**

b). **Critically evaluate** the importance of “competitive intelligence” for a successful entrepreneur and **briefly explain** four ethical ways to obtain information from competitors. **(13 Marks)**

**Question 3** **(Total Marks 25)**

a). **Describe** five (05) ethical and legal challenges faced by a new firm in brief. **(10 Marks)**

b). Suppose you plan to start a new business in a highly competitive industry. **Evaluate and justify** a suitable business model to obtain competitive advantage. **(15 Marks)**

**Question 4** **(Total Marks 25)**

a). **Briefly discuss** the five (05) finance options available for new startups. **(10 Marks)**

b). **Critically evaluate** four (04) advantages and four (04) disadvantages of registering a business as a limited liability company instead of a sole proprietorship or partnership. **(15 Marks)**

\*\*\*\*\***End of the question paper**\*\*\*\*\*

<i>Number of pages</i>	3
<i>Number of questions</i>	5



**UNIVERSITY OF SRI JAYEWARDENEPURA  
Faculty of Technology**

**Bachelor of Information and Communication Technology Honours Degree**

**Fourth Year Second Semester End Examination**

**May 2023**

**ITC 4172: Entrepreneurship and Small Business Management**

**Time allowed: Two (02) Hours**

**Answer ALL questions**

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**Read and follow the instructions given below:**

- This is a **closed-book examination**.
- The marks assigned for each question are included in brackets.
- “**Index number**” and course code “**ITC4172**” should be written on top of each page of the answer script, and pages must be **numbered appropriately**.
- Start each question on a new page.
- Draw clearly labelled diagrams wherever necessary.
- If you have any doubts as to the interpretation of the wording of a question, make your own assumptions, but clearly state them on the answer script.

**Question 1** **(Total Marks 20)**

a). “Opportunities are like sunrises. If you wait too long, you miss them.” **Briefly explain** four (04) essential qualities of business opportunities with examples. **(8 Marks)**

b). Suppose you plan to start a business relevant to your focus area. Based on the six (06) steps in the entrepreneurial process **briefly discuss** how you are going to establish the business successfully in the market. **(12 Marks)**

**Question 2** **(Total Marks 20)**

a). “Feasibility analysis is the process of determining whether a business idea is viable.” **Evaluate** four (04) main components of feasibility analysis with their subcomponents. **(8 Marks)**

b). “All entrepreneurs are businessmen, but not all businessmen are entrepreneurs” **Critically evaluate** this statement based on nature, goals, risk margin, market position and operation of the entrepreneurs’ and businessmen’. **(5 Marks)**

c). **Critically evaluate** the importance of “competitive intelligence” for a successful entrepreneur and **briefly explain** four ethical ways to obtain information from competitors. **(7 Marks)**

**Question 3** **(Total Marks 20)**

a). **Describe** five (05) ethical and legal challenges faced by a new firm in brief. **(10 Marks)**

b). Suppose you plan to start a new business in a highly competitive industry. **Evaluate and justify** a suitable business model to obtain competitive advantage. **(10 Marks)**

**Question 4** **(Total Marks 20)**

a). **Briefly discuss** the six (06) finance options available for new startups. **(6 Marks)**

b). **Critically evaluate** four (04) advantages and four (04) disadvantages of registering a business as a limited liability company instead of a sole proprietorship or partnership. **(14 Marks)**

**Question 5****(Total Marks 20)**

"The success of a business depends on strategies." Therefore, assess the importance of below mentioned concepts with industry level examples.

- a) Value Chain Analysis
- b) Porter's Generic Strategies
- c) Ansoff Matrix
- d) BCG Matrix
- e) Digitalization of business

*(4 Marks x 5 concepts = 20 Marks)*

\*\*\*\*\*End of the question paper\*\*\*\*\*

<i>Number of pages</i>	<b>5</b>
<i>Number of questions</i>	<b>4</b>



**UNIVERSITY OF SRI JAYEWARDENEPURA  
Faculty of Technology**

**Bachelor of Information and Communication Technology Honours Degree**

**Fourth Year Second Semester End Examination**

**May 2023**

**ITC4182 Professional Practices in ICT**

**Time allowed: Two (02) Hours**

**Answer ALL questions**

**Read and follow the instructions given below:**

- This is a **closed book examination**.
- The marks assigned for each question are included in brackets.
- **"Index number" and course code "ITC4182"** should be written on top of each page of the answer script, and pages must be numbered appropriately.

**Question 1** **(Total 25 Marks)**

- a. List two (2) key general professional characteristics. ( 2 marks)
- b. State the importance of "Intellectual Property" in the Information and ( 3 marks) Communication (ICT) domain.
- c. Differentiate "Professional Communication" and "General ( 4 marks) Communication".
- d. The Code of Conduct of the British Computer Society (BCS) says, "You ( 5 marks) shall have due regard for the legitimate rights of third parties" under the first section "Public Interest". Discuss this statement.
- e. In order to influence, motivate, and direct their followers, leaders adopt (6 marks) different behavioral approaches. Justify this statement using two (2) primary leadership styles.

- f. Professional ethics are vital as technologies are changing rapidly and bring (5 marks) enormous benefits to the living conditions of humans. Therefore, "Professional Ethics" are very important to ensure privacy, honesty and fairness. Discuss this statement with regard to the impact of *Social Media* in modern society.

## Question 2

(Total 25 Marks)

Consider the following scenario.

A group of three individuals designed and developed a mobile application as a group project. Suppose that you are a member of the team. The application has the capability of alerting the users about the promotions, discounts and offers of various products and services based on certain criteria such as time period, geographical location and preferences. It provides a separate interface for product/service owners to enter the details of respective promotions, discounts and offers. A few retail outlets and service companies in the area have already supported the team and also the mobile application is available for downloading in Google Play Store. Moreover, the team members have gradually improved the application by adding new features and functionalities. The team members are competent and have the capability of carrying out further enhancements and improvements.

ABC (Pvt) Ltd, an IT Startup Company established in 2015 has recently contacted one of the team members and has indicated that they are willing to see the possibility of engaging with you to commercialize your product. This company has successfully launched a few interactive mobile applications. As the first step, ABC (Pvt) Ltd has requested the team to do a complete product demonstration and start discussions on the way forward.

Prior to conducting the demonstration and starting discussions with ABC (Pvt) Ltd, group members met and prepared a comprehensive check-list with a responsibility matrix of all action items and did a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis.

Answer the following questions based on the above description.

- a. As the member responsible for assessing the protectable works and elements (3 marks) related to the above scenario, list three (3) different types of Intellectual Property (IP) applicable for the above scenario.

- b. State the way to protect each item listed in part (a) under the IP law. (5 marks)
- c. Based on the SWOT analysis, list three (3) strengths and three (3) (6 marks) weaknesses of the team members with regard to carrying out further enhancements, improvements and maintenance of the application.
- d. List and elaborate on three (3) key areas which you anticipate during the (6 marks) negotiations with ABC (Pvt) Ltd.
- e. Effective communication between the parties is one of the key requirements for successful negotiations and decision making.
- i. Define "Effective Communication". (2 marks)
- ii. Explain how you ensure effective communication between parties if you (3 marks) are the team leader.

### **Question 3 (Total 20 Marks)**

Digital laws play a major role in the Information and Communication Technology (ICT) sector by providing the necessary legal acceptance to use electronic data and digital documents for business transactions and personal purposes. Like in many other countries, several Acts have been enacted as legislation in Sri Lanka in a timely manner.

- a.
- i. Name and brief the Act in Sri Lanka enacted with the objective of (2 marks)  
"Identification, Investigation and Prevention of Computer Crimes".
- ii. Name and brief the Act in Sri Lanka related to the objective of (2 marks)  
"preventing unauthorized or counterfeit payment devices".
- b. Personal Data Protection Act, No. 9 of 2022 is the most recent Act enacted in (4 marks) Sri Lanka. Briefly explain the importance of personal data protection.
- c. Explain how digital laws benefit the businesses and citizens. (5 marks)



- d. Electronic Transactions Act, No. 19 of 2006 is one such major act related to (7 marks) ICT professionals. One of the major objectives was eliminating the barriers for providing effective and efficient services to the citizens by the Government, or to provide Government services electronically (e-Government services). Discuss this statement.

**Question 4**

**(Total 30 Marks)**

Consider the following scenario.

A non-IT services company has hired you as the “Manager – ICT”. The company has recently faced immense difficulties due to various problems such as frequent failures of the Intranet, failures, errors and slowness of the backend system and hacking of the company website. As the Manager-ICT, you are responsible for all ICT related matters including the hardware, network, software, including managing suppliers, support services providers and vendors. You have been given the critical target of investigating the current status and to establish proper ICT governance framework to ensure smooth functioning and to achieve the maximum benefits.

- a. During your investigations, it has been revealed that the company doesn't (6 marks) have proper contracts with any third-party suppliers, support services providers and vendors. You have to prepare a document for the senior management highlighting the importance and critical requirement of having proper contracts. Brief three (3) key points you may highlight.
- b. In this context, you need to talk to the Legal Officer of the company to draft (6 marks) contract templates. As the next step, you need to verify those templates whether they contain the essential components. State the essential components in a contract.

- c. You further investigate that the existing core software platform and the (7 marks) database are not secure, reliable and not scalable to meet the current and future demand due to various reasons such as obsolete technologies, lack of documentation and license issues. It has been further revealed that the third parties had full access to the database which contains the complete customer information of the company without any encryption. The management has informed you that the customer database is very critical and it will be a major risk if the competitors get it. Briefly explain the way you manage this situation, mainly with regard to intellectual property.
- d. In order to make the processes efficient and to attract more customers, you (11 marks) have been requested to introduce electronic signature and electronic payments. Explain benefits, legal recognition, validity and enforceability of this initiative.

\*\*\* *End of the Paper* \*\*\*



<i>Number of pages</i>	3
<i>Number of questions</i>	4



## UNIVERSITY OF SRI JAYEWARDENEPURA

### Faculty of Technology

**Bachelor of Information and Communication Technology Honours Degree**

**Fourth Year Second Semester Examination**

**May 2023**

**ITC4212: Information Systems Strategy and IT Governance**

**Time allowed: Two (02) Hours**

**Answer ALL questions**

**Read and follow the instructions given below:**

- a. “Index number” and course code “ITC4212” should be written on top of each page of the answer script, and pages must be numbered appropriately.

#### Question 1

**Total Marks 25**

- A. Differentiate IT management and IT governance. (4 Marks)
- B. Examine the dissimilarities between IT service management and IT governance in relation to the maturity of an organisation's IT function. (6 Marks)
- C. Describe the process of IT governance with the help of a neat diagram. (10 Marks)
- D. Most IT governance definitions state that IT governance is the responsibility of the board of directors and executive management. Justify the statement. (5 Marks)

<b>Question 2</b>	<b>Total Marks 25</b>
A. How can you identify if an organisation's IT strategy is not aligned with its overall business goals and objectives? (5 Marks)	
B. Discuss how multiple IT governance frameworks, such as COBIT, ITIL, and ISO 38500, can be integrated within an organisation to increase IT governance effectiveness. (10 marks)	
C. Evaluate the impact of different organisational factors on the selection of an appropriate IT governance framework. (4 Marks)	
D. An organisation's level of IT maturity can have a significant impact on its ability to achieve effective alignment between its IT strategy and overall business goals. Justify the above statement. (6 Marks)	

<b>Question 3</b>	<b>Total Marks 25</b>
A. Companies that fail to develop new products are putting themselves at risk. At the same time, new product developments are risky. List four (4) reasons for the failure of new products. (4 Marks)	
B. How can 'effective communication' between IT and business units facilitate the alignment of IT strategies with overall business goals? (5 Marks)	
C. Describe the competitive dynamic model with an industry example. (8 Marks)	
D. Describe IS focus and priorities based on any of the following four (4) aspects if the business strategy of the organisation is to create an operationally excellent environment. (8 Marks)	
<ul style="list-style-type: none"> <li>● Business strategy</li> <li>● IS strategy</li> <li>● Technology</li> <li>● IS organization</li> <li>● IS processes</li> <li>● IS metrics</li> </ul>	

<b>Question 4</b>	<b>Total Marks 25</b>
A. Describe the benefits of IS strategic planning.	(5 Marks)
B. What are the key differences between a vision statement and a mission statement?	(4 Marks)
C. IS strategy plans can affect a company's return on investment and profitability. Justify this statement with examples.	(8 Marks)
D. The strategic planning process encompasses three phases-situation analysis, strategy formulation, and strategy implementation. Discuss the statement.	(8 Marks)

\*\*\*\*\* End of the Paper \*\*\*\*\*

<b>Number of pages</b>	<b>2</b>
<b>Number of questions</b>	<b>4</b>



**UNIVERSITY OF SRI JAYEWARDENEPURA  
Faculty of Technology**

**Bachelor of Information and Communication Technology Honours Degree**

**Fourth Year Second Semester End Examination**

**May 2023**

**ITS4202 Emerging Technologies**

**Time allowed: Two (02) Hours**

**Answer ALL questions**

**Read and follow the instructions given below:**

- “Index number” and course code “ITS4202” should be written on top of each page of the answer script, and pages must be numbered appropriately.

**Question 1**

**(Total 25 Marks)**

- a. Briefly explain Test Driven Development (TDD) in software development. (4 Marks)
- b. Explain the difference between Sequential and Incremental lifecycle models in software development. (6 Marks)
- c. State five (5) benefits of using Artificial Intelligence (AI) in software testing. (5 Marks)
- d. *“Data science combines math and statistics, specialized programming, advanced analytics, artificial intelligence (AI), and machine learning with specific subject matter expertise to uncover actionable insights hidden in an organization’s data.”* ~Extracted from IBM
  - i. List four (4) major stages of the data science lifecycle. (4 Marks)
  - ii. Describe three (3) ways of applying data science for software testing with examples. (6 Marks)

**Question 2**

**(Total 25 Marks)**

- a. Briefly explain Behavior Driven Development (BDD) in software development. (4 Marks)
- b. Describe the three (3) advantages of blockchain in software development. (6 Marks)
- c. Briefly explain the following key methodologies in an Agile development. (6 Marks)
  - i. Kanban
  - ii. Scrum
  - iii. SAFe



- d. Design a mind map for the following requirement. **(9 Marks)**

The application of human resource (HR) management allows HR manager to login with a valid username and valid password. Once logged into the system successfully, the HR manager should be able to look into employee profiles, review leaves and attendance reports and approval/rejection of the timesheets.

**Question 3** **(Total 25 Marks)**

- a. Explain the ‘intelligence’ in the context of Artificial Intelligence (AI) with two (2) examples. **(4 Marks)**
- b. Explain the role of Turing Test and provide an example of how it can be applied in Natural Language Processing (NLP). **(5 Marks)**
- c. List the four (4) categories of AI definitions and elaborate on each. **(8 Marks)**
- d. Describe the following characteristics of a problem to identify the best possible solution in AI.
  - i. Decomposable problem
  - ii. Non-Decomposable problem
  - iii. Recoverable problems
  - iv. Irrecoverable problems

**Question 4** **(Total 25 Marks)**

- a. Explain two (2) of following objectives of cybersecurity with examples. **(6 Marks)**
  - Confidentiality
  - Integrity
  - Availability
- b. Explain three (3) cybersecurity framework functions with real-world examples. **(6 Marks)**
- c. Describe the usage of middleware architecture in application development. **(6 Marks)**
- d. Compare and contrast the continuous integration and continuous delivery in DevOps. **(7 Marks)**

<i>Number of pages</i>	<b>3</b>
<i>Number of questions</i>	<b>5</b>



**UNIVERSITY OF SRI JAYEWARDENEPURA  
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**Bachelor of Information and Communication Technology Honours Degree**

**Fourth Year Second Semester End Examination**

**May 2023**

**ITS4243 Microservices and Cloud Computing**

**Time allowed: Three (03) Hours**

**Answer ALL questions**

**Read and follow the instructions given below:**

- “Index number” and course code “ITS4243” should be written on top of each page of the answer script, and pages must be numbered appropriately.

**Question 1 (Total 10 Marks)**

- A. Briefly explain your understanding on Software Architectural Style. (02 marks)
- B. List down two (2) microservices design principles and explain their application. (04 marks)
- C. Briefly explain three (3) cloud deployment models. (04 marks)

**Question 2 (Total 15 Marks)**

Write short notes for the following.

- A. Container orchestration platform (05 marks)
- B. SAAS, PAAS, IAAS (Briefly explain each of the terms) (05 marks)
- C. Reserved instances, Right sizing (Briefly explain each of the terms) (05 marks)

**Answer the Questions 3, 4, and 5 based on the use case below.**

**Use case:**

"Outdoor Cooking" is an organization in Sri Lanka which was doing the food business for outside dinning nearly twenty years. Throughout last decade of the 1990s and dawning of year 2000 it was extremely successful with over 800 branches, but during the last five years, the revenue of the organization has been dropped drastically due to rivalry. Declining the Information technology adaptation, outdoor cooking could not get the competitive edge over rivalry. The Organization has identified this challenge and has nominated "Innovate Sys" as an IT consultancy organization to assist them with the technology innovation. Outdoor Cooking is looking to innovate in all four dimensions and their priority is technology innovation which will spark business process innovation.

Outdoor cooking currently has nearly 500 branches spread over the Island-wide which operate as a network, but it is a drop from where they used to be. The Organization specially looking for online booking system in order to increase their sales and profit margins. "Innovate Sys" is a fairly new organization where it is a challenge for them to address the requirements of the Outdoor Cooking organization. At the moment they are facing a major challenge in deciding upon the software architecture style.

**Question 3 (Total 25 Marks)**

You are appointed as the new Solution Architect to this project, you are supposed to direct "Innovate sys" to take the enterprise approach to develop the solution.

- A. Explain the enterprise software development approach. (08 marks)
- B. List down seven (7) important areas to consider under business architecture. (07 marks)
- C. Briefly explain what is a client requirement and a user story. (05 marks)
- D. Explain what functional requirements and non-functional requirements. (05 marks)

**Question 4 (Total 20 Marks)**

As a Solution Architect to this project, you are supposed to assist "Innovate Sys" to decide upon the software architecture style.

- A. How do you justify microservices as the suitable architecture for the solution. (05 marks)

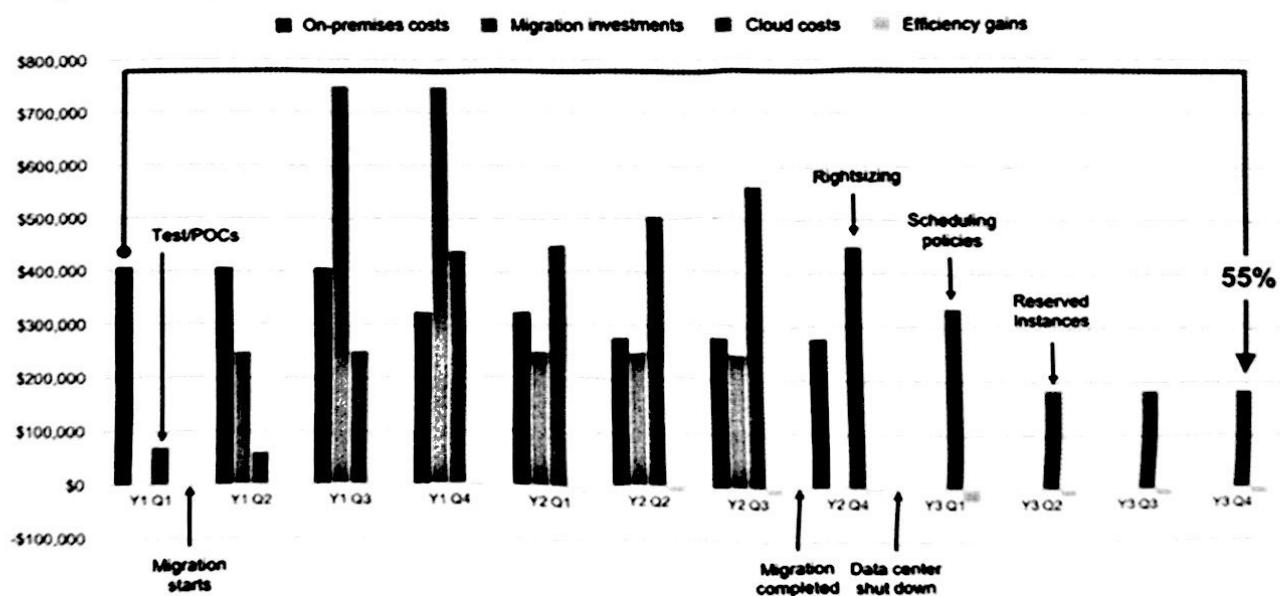
- B. What are the design patterns you are suggesting for this solution? (07 marks)
- C. Come up with a solution architecture diagram which depicts (08 marks) communication between microservices including a discovery server as well.

### **Question 5 (Total 30 Marks)**

During the initial investigation of the project as the solution architect, you have identified moving to a cloud-based solution with a containerized design will be a futuristic solution.

- A. Briefly explain what you understand by “lift” and “shift” in a cloud (05 marks) migration project.
- B. Refer to the diagram below and explain it in your own words. (07 marks)

**Example TCO of Migration to Cloud IaaS Over Three Years**



- C. What do you understand by composing a container image? (08 marks)
- D. You are supposed to containerize the microservices and list the steps that you should follow to compose and upload an image to the docker repository for testing purposes. (10 marks)

\*\*\* End of the Paper\*\*\*

