

NATIONAL INSTITUTE OF BUSINESS MANAGEMENT**Higher Diploma in Software Engineering-21.1P****Enterprise Application Development-2****Time allowed: Two hours****26 March 2022****INSTRUCTIONS TO CANDIDATES**

- This paper contains 4 questions. The total marks obtainable for this examination is 100.
- Answer ALL questions.

QUESTION 01 – (25 Marks)

- I. Describe what an Enterprise application is. **(5 marks)**
- II. Briefly explain why the scalability of an enterprise application is important. **(4 marks)**
- III. List down the types of session beans in EJB and their usage. **(8 marks)**
- IV. Explain what the Java Message Service (JMS) is. **(4 marks)**
- V. Briefly explain Point-to-Point and Publisher/Subscriber messaging domains. **(4 marks)**

QUESTION 02 – (25 Marks)

- I. Draw and explain the MVC architecture and clearly illustrate the interconnection between each of the components. **(5 marks)**
- II. Briefly explain the difference between JSP including action and include directive. **(4 marks)**
- III. List down the methods used in each stage of the life cycle of a servlet. **(4 marks)**
- IV. What is the difference between a web server and an application server? **(4 marks)**
- V. Briefly explain how the servlet container handles a dynamic request. You may use an illustration to support your answer. **(8 marks)**

QUESTION 03 – (25 Marks)

- I. Describe what a framework is and list down the advantages of using a framework. (3 marks)
- II. State the components of HTTP request and HTTP response. (2 marks)
- III. List four commonly used HTTP methods in a REST-based architecture. Briefly explain the usage of those methods. (8 marks)
- IV. Is REST interoperable? Explain (4 marks)
- V. Define the REST URLs for the below scenarios, (8 marks)

#	Use Case	HTTP Method	URL
1	Get user by given user id		
2	Delete user by given user id		
3	Create user		
4	Update user		

QUESTION 04 – (25 Marks)

- I. Explain monolith architecture. (3 marks)
- II. What is the purpose of Service Registry in microservice architecture? (4 marks)
- III. Describe how microservice architecture increases the availability of a system. (4 marks)
- IV. Describe what is meant by 'single point of failure' (SPOF). Also, explain how you can avoid SPOF in a microservice architecture. (4 marks)
- V. The team was assigned to build an application for the agriculture industry. The system should be able to measure the soil condition of the faddy fields and recommend the fertilizer level that needs to add, this component interacts with the special electronic device so might need to use a specific technology stack for the component. Also, the proposed system should be able to integrate with the existing agriculture department system. Farmers should be able to order fertilizer via the mobile application and the fertilizer sellers should process those orders via the web application.

As the architect of the team, what is the suitable architecture for the system? Clearly define relevant facts and reasons which supported the decision. (10 marks)