SLIATE
SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION
(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Information Technology
Second Year, Second Semester Examination– 2022
HNDIT 4232 – Enterprise Architecture

Instructions for Candidates:
Answer any **five (05)** questions.
All questions carry equal marks.

No. of questions : 06
No. of pages : 05
Time: **Three (03) Hours**

Question 01

1. State the meaning of the abbreviation JDBC? (03 Marks)
2. The bellow class would create a JDBC connection for a database. Fill the blanks in the bellow code and complete it. (05 Marks)

```
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;

public class DBConnection {
private static _ _(01)_ _ con;
        public static Connection dbCon(){
        try{
                final String connectionUrl = "jdbc:mysql://localhost: _ _(02)_ _
                /java_test?serverTimezone=UTC";
                final String user="nadeera";
                final String password="Admin@1234";
                con = _ _(03)_ _ .getConnection(connectionUrl, user, password);
        }
        catch(_ _(04)_ _ ex){
                        System.out.println("Error"+ex);
                }
                return _ _(05)_ _;
        }
}
```

3. Following code is extracted from a Servlet which uses session information. Understand the code and fill the gaps. (06 Marks)

```
protected void doPost(HttpServletRequest request, HttpServletResponse __(01)__)
throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out =__(02)__.getWriter();
        String uname = request.getParameter("uname");
        String pass = request.getParameter("pass");
        out.println("<!DOCTYPE html>");
        out.println("<html>");
        out.println("<head>");
        out.println("<title>Servlet login</title>");
        out.println("</head>");
        out.println("<body>");

        if (Validate.loginValidate(uname, pass)) {
                //Create Session
                HttpSession __(03)__ = request.getSession();
                session.setAttribute("username", uname);
                //Setting a Cookie
                Cookie ck = new __(04)__("cname", uname);
                ck.setMaxAge(60 * 60);
                __(05)__.addCookie(ck);
                response.sendRedirect("welcome");
        } else {
                out.print("Login Failed");
        }
        __(06)__.println("</body>");
        out.println("</html>");
}
```

4. Write a short note on the following two topics. (06 Marks)
   a. Session
   b. Cookies

Question 02

1. State the meaning of abbreviation XML? (03 Marks)
2. Below table shows that some books are available in a bookstore.

ID	Title	Author	Genre	Price	Publication Date
1	"The Great Gatsby"	F. Scott Fitzgerald	Fiction	$10.99	1925-04-10
2	"To Kill a Mockingbird"	Harper Lee	Fiction	$7.99	1960-07-11
3	"Harry Potter and the Philosopher's Stone"	J.K. Rowling	Fantasy	$12.99	1997-06-26

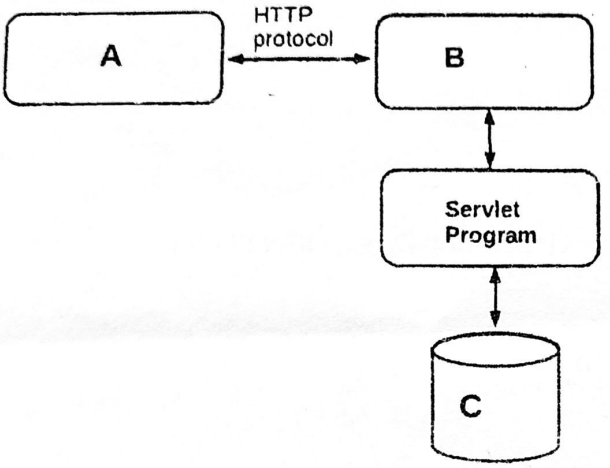
   a. Write XML code to represent the above data. (09 Marks)
   b. Write DTD for the above XML file. (08 Marks)

Question 03

1. Briefly explain the Client Server Architecture with a suitable diagram. (06 Marks)
2. State three layers available in the *Three Tier* application model. (03 Marks)
3. State three main components of MVC Architecture. (03 Marks)
4. Briefly explain the MVC Architecture. (08 Marks)

Question 04

1. Briefly explain the term "servlet". (04 Marks)
2. The below diagram is related to servlet architecture. Name the Blocks A, B and C (03 Marks)



3. List four methods available in the servlet. (04 Marks)
4. Below code would show a Servlet Program code. Fill the blank and complete the code. (09 Marks)

```
// Import required java libraries
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;

// Extend HttpServlet class
public class HelloWorld extends __(01)__ {
        private String __(02)__;

        public void __(03)__() throws ServletException {
                // Do required initialization
                message = "Hello World";
        }

        public void __(04)__(HttpServletRequest __(05)__ , __(06)__ response)
        throws __(07)__, IOException {
                // Set response content type
                response.setContentType("text/html");
                // Actual logic goes here.
                __(08)__ out = response.getWriter();
```

```
            out.println("<h1>" + __(09)__ + "</h1>");
        }

        public void destroy() {
            // do nothing.
        }
    }
```

Question 05

1. Briefly explain the frame "Hibernate" . (04 Marks)
2. State four advantages of using hibernate framework. (04 Marks)
3. Consider the following code and write getters and setter for the class. (06 Marks)

```
import javax.persistence.*;

@Entity
@Table(name = "students")
public class Student {
   @Id
   @GeneratedValue(strategy = GenerationType.IDENTITY)
   private int id;

   @Column(name = "first_name")
   private String firstName;

   @Column(name = "last_name")
   private String lastName;

   @Column(name = "email")
   private String email;

   public Student() {}

   public Student(String firstName, String lastName, String email) {
      this.firstName = firstName;
      this.lastName = lastName;
      this.email = email;
   }

   // Getters and setters
}
```

4. Briefly explain the purpose of the below class (06 Marks)

```
import org.hibernate.Session;
import org.hibernate.SessionFactory;
import org.hibernate.cfg.Configuration;

public class HibernateExample {
   public static void main(String[] args) {
      // Create Hibernate configuration
```

```
        Configuration cfg = new Configuration();
        cfg.configure("hibernate.cfg.xml");
        cfg.addAnnotatedClass(Student.class);

        // Create session factory
        SessionFactory factory = cfg.buildSessionFactory();

        // Create session
        Session session = factory.getCurrentSession();

        try {
            // Create a student object
            Student student = new Student("John", "Doe", "john@example.com");

            // Begin transaction
            session.beginTransaction();

            // Save the student object to the database
            session.save(student);

            // Commit transaction
            session.getTransaction().commit();

            System.out.println("Student saved successfully with ID: " + student.getId());
        } finally {
            // Close session and factory
            session.close();
            factory.close();
        }
    }
}
```

Question 06

1. Define the term "Enterprise Java Bean" (04 Marks)
2. List three types of Enterprise Java Bean. (06 Marks)
3. State three types of session beans. (03 Marks)
4. Compare and contrast Java Servlets and Enterprise Java Bean. (07 Marks)