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|  | | **SEMESTER:**  **ASSESSMENT:** | | | 1  PAPER B MEMO | | | | | |  |
| **SUBJECT NAME:** | | | | INTERNET PROGRAMMING | | | | | | | | | | | |
| **SUBJECT CODE:** | | | | INT316D | | | | | | | | | | | |
| **QUALIFICATION(S):** | | | | DPRS20/DPRSF0 | | | | | | | | | | | |
| **PAPER DESCRIPTION:** | | | | Computer Based | | | **DURATION:** | 4 HOURS | | | | **PAPER:** | Only | | |
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| **SPECIAL REQUIREMENTS** | | | | | | | | | | | | | | | |
| □ **NONE** | | | | | | | | | | | | | | | |
| □ **NON-PROGRAMMABLE POCKET CALCULATOR** | | | | | | | | | | | | | | | |
| □ **SCIENTIFIC CALCULATOR** | | | | | | | | | | | | | | | |
| □ **COMPUTER ANSWER SHEET** | | | | | | | | | | | | | | | |
| □ **GRAPH PAPER** | | | | | | | | | | | | | | | |
| □ **DRAWING INSTRUMENTS** | | | | | | | | | | | | | | | |
| **OTHER:** | | COMPUTER | | | | | | | | | | | | | |
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| **INSTRUCTIONS TO CANDIDATES:** | | | | | ANSWER ALL QUESTIONS | | | | | | | | | | |
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| **EXAMINER:** | | | MR V MEMANI | | | | | | |  | **FULL MARKS:** | | | 100 | |
| **MODERATOR:** | | | MR X PIYOSE | | | | | | |  | **TOTAL MARKS**: | | | 100 | |
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| **Question 1: Theory [30]**  Please note: I’m not expecting students to state verbatim what is contained in this memo. What I provide here is model answers. I want students to freely express themselves without diluting the actual meaning of concepts. Please apply your discretion when marking this section.   * 1. Discuss the following concepts (refer to Note1, Note2, and Note3 below as a guide on the points that you need to include in your discussion):      1. JEE.      2. Multi-tier Web Applications.      3. Stateful Session Beans.   Note1: In your discussion of JEE, address each of the following aspects:   * State what the acronym JEE stands for. (1)   Java Enterprise Edition.     * Define JEE. (1)   Collection of APIs for developing business applications that are **highly-available**, **secured**, **robust**, and **scalable**.   * Describe the four concepts that emanate from the definition of JEE. (4)   1. High availability  High availability means the enterprise web applications are available 24/7. This high availability over the web is due to the deployment of the business applications in servers, that run non-stop.  2. Secure  By secure we mean that the web applications implement security measures. In a secured system, users are authenticated and access to resources is role based. Only authorized users are able to access resources in the system.  3. Fault-tolerance  By fault-tolerant, we mean that the enterprise web applications can handle exceptions that may occur during program execution. This makes enterprise web applications robust, meaning, they fail safely amid unexpected error conditions.  4. Scalability  Scalable applications are applications that continue functioning even when new components are added to the system. They don’t require the whole system to be rewritten just because a new component is added.  How to mark?  1 mark for each sufficient explanation.   * Differentiate between a Web Server and an Application Server. Give examples. (4)   Web Server is a container that supports the Web components of the JEE standard.  Example: Tomcat  Application Server is a container that supports both the Web and EJB components of the JEE standard.  Example: TomEE  How to mark?   1. Web Server  * 1 mark for the definition. * 1 mark for providing a Web Server example.  1. Application Server  * 1 mark for the definition. * 1 mark for providing an Application Server example.   Note2: In your discussion of Multi-tier Web Applications, address each of the following aspects:   * Define Multi-tier Web Applications. (1)   Web applications with components distributed over layers or tiers. Each tier is responsible for a specific task.   * List the four levels of Multi-tier Applications. (4)   Presentation layer  Business layer  Persistence layer  Database layer    How to mark?  1 mark for each layer given.   * Describe each level of Multi-tier Web Applications. (4)   1. Presentation layer  A layer responsible for viewing data. It is part of the JEE structure.  2. Business layer  A layer responsible for performing business logic. It is part of the JEE structure.  3. Persistence layer  A layer responsible for communicating with the database. It is part of the JEE structure.  4. Database layer  The layer where specific relational databases reside. This is not part of the JEE structure. A Java application can communicate with any database.    How to mark?  1 mark for each description given.  Note3: In your discussion of Stateful Session Beans, address each of the following aspects:   * Define Stateful Session Beans. (1)   EJB components that remember previous states during communication with clients.   * List the lifecycle stages of Stateful Session Beans. (3)   Does not exist  Ready  Passive  How to mark?  1 mark for each stage given.   * Describe each lifecycle stage of Stateful Session Beans. (7)   Does not exist  The container is responsible for creating a pool of stateless session beans. The beans are created either at startup of the container or at first invocation. Before then, the beans are not existing.  Ready  After creation, the stateful session beans are ready to service client requests. During instantiation, the container performs any dependency injection required by the beans and thereafter execute methods annotated with @PostConstruct. These are methods that must be executed after the container has constructed the beans. This could be seen as code that a programmer might want to run to initialize a bean, like the opening of connections to databases. The bean spends most of its time at this stage servicing client requests. The container is responsible for creating many instances of stateless session beans and keep them in a pool. When a request is made for a bean, the container retrieves a bean the same bean for the same client from the pool and services the request. After a request has been serviced, the bean is taken back to the pool.  Lastly, a bean method can also be annotated with an @PreDestroy annotation. This is code that must be ran before a bean is destroyed. This could be seen as more of clean-up code, closing connections to databases before a bean is destroyed by the container.  Passive  When the bean is inactive, the container moves it to to the Passive state. There’s a @PrePassivate annotation that a programmer can annotate a method with. This is code that a container will have to execute before taking the bean to the Passive state. When a client makes a call for the bean, the container would run first any method annotated with the @PostActivate annotation before moving the bean to the Ready state.  How to mark?   1. Does not exist  * Has the student sufficiently explained a concept? – 2 marks * Or, has a student made a fair attempt? – 1 mark * Or, is the student off the mark? - 0  1. Ready  * Has the student sufficiently explained the concept? – 2 marks * Or, has a student made a fair attempt? – 1 mark * Or, is the student off the mark? - 0  1. Passive  * Has the student sufficiently explained the concept? – 3 marks * Or, has a student made a fair attempt? – 2 mark * Or, is the student off the mark? - 0  |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Question 2: Practical - mini project [70]**  How to mark?  Please refer to the attached rubric.   |  | | --- | |  | |  | |  | |  | | |  | |  | |
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