**Assignment #01**

**Software Project Planning**

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**Q no 1: Select any software project of your choice (e.g., Online Shopping System, Library Management System, Hospital Management System, etc.).**

**Based on the selected project, complete the following tasks:**

Create a detailed Work Breakdown Structure (WBS) for the selected project.

Your WBS should include at least **Three levels of decomposition**:

* Project Name
* Major Deliverables/Phases
* Sub-deliverables / Tasks

**Work Breakdown Structure (WBS) for an Online Shopping System**

***Level 1: Project Name***

Online Shopping System (E-Commerce Platform)

***Level 2: Major Deliverables/Phases***

1. Project Initiation & Planning

2. Requirements Gathering & Analysis

3. System Design

4. Development

5. Testing

6. Deployment

7. Maintenance & Support

***Level 3: Sub-Deliverables / Tasks***

1. Project Initiation & Planning

* Define project scope and objectives
* Identify stakeholders
* Develop project schedule & budget
* Assign roles and responsibilities

2. Requirements Gathering & Analysis

* Conduct stakeholder interviews
* Define functional requirements (user registration, product catalog, cart, checkout, etc.)
* Define non-functional requirements (security, performance, scalability)
* Document Software Requirements Specification (SRS)

3. System Design

* **Architecture Design** (Monolithic vs. Microservices, Database Design)
* **UI/UX Design** (Wireframing, Prototyping, Responsive Design)
* **Database Design**(ER Diagrams, Schema Definition)
* **API Design** (RESTful endpoints for frontend-backend communication)

4. Development

**Frontend Development**

* User registration & login
* Product listing & search
* Shopping cart & checkout
* Order tracking

**Backend Development**

* Authentication & authorization
* Product management (CRUD operations)
* Payment gateway integration
* Order processing

**Database Implementation**

* Set up MySQL/PostgreSQL
* Optimize queries & indexing

5. Testing

* Unit Testing (Individual modules)
* Integration Testing (APIs, database interactions)
* System Testing (End-to-end workflows)
* User Acceptance Testing (UAT) with stakeholders
* Performance & Security Testing

6. Deployment

* Set up cloud hosting (AWS/Azure)
* Configure domain & SSL certificate
* Deploy frontend (React/Angular)
* Deploy backend (Node.js/Django)
* Database migration & backup setup

7. Maintenance & Support

* Bug fixes & patches
* Performance optimization
* Feature enhancements (customer feedback)
* Regular security updates

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**Q no 2:** **Define an Activity** from the WBS that you have created. Your activity description should include:

* Activity Title
* Steps to Perform

**Activity Title:**

"Payment Gateway Integration" (Under Development → Backend Development)

**Steps to Perform:**

**1. Research & Select Payment Gateway**

* Compare different payment providers (e.g., Stripe, PayPal, Square).
* Choose based on transaction fees, security, and regional availability.

**2. Obtain API Credentials**

* Register for a developer account with the selected payment provider.
* Retrieve API keys (sandbox for testing, production for live transactions).

**3. Implement Payment Processing Logic**

* Create backend API endpoints to handle payment requests.
* Encrypt sensitive data (credit card details) using HTTPS & tokenization.

**4. Integrate with Frontend Checkout Page**

* Design a secure checkout form (card number, expiry, CVV).
* Connect frontend to backend APIs for transaction processing.

**5. Test Transactions in Sandbox Mode**

* Simulate successful payments, failed transactions, and refunds.
* Validate error handling (e.g., expired cards, insufficient funds).

**6. Deploy to Production**

* Replace sandbox API keys with live credentials.
* Monitor initial transactions for issues.

**7. Documentation & Compliance**

* Document integration steps for future maintenance.
* Ensure compliance with PCI-DSS (Payment Card Industry Data Security Standard).

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