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# Daffodil International University

**Faculty of Science & Information Technology**
**Department of Computer Science and Engineering**
**Midterm Examination, Fall 2026**
**Course Code: CSE 315, Course Title: Software Engineering**
**Level: 3 Term: 1 Batch:67**

**Time: 1:30 Hrs.** **Marks: 25**

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**Answer ALL Questions:** ***[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]***

A university plans to develop a **Smart Research Grant and Ethics Approval System** to manage research proposals submitted by faculty members and postgraduate students. Applicants log in using university credentials and submit proposals containing the research title, objectives, methodology, estimated budget, project duration, and supporting documents. Each applicant may have a maximum of two active proposals. If required information is missing, the system saves the proposal as a draft and notifies the applicant.

After submission, proposals requesting up to BDT 200,000 are assigned to one departmental reviewer. Proposals requesting more than BDT 200,000 require two independent reviewers. If their scores differ by more than 25 points out of 100, a third reviewer is assigned, and the median of the three scores becomes the final score. Otherwise, the average of the available scores is used.

Proposals involving human participants, sensitive personal data, or medical experiments must undergo Research Ethics Committee review. The committee may approve, reject, or request revisions. Applicants must resubmit revised proposals within 10 working days; otherwise, the proposals are automatically marked as withdrawn.

A proposal qualifies for funding if its final score is at least 70, its budget is within the university's funding limit, and all mandatory approvals have been obtained. If the total requested amount exceeds the remaining university budget, eligible proposals are ranked by score, and funding is allocated in descending order until the available budget is exhausted. Unfunded eligible proposals are placed on a reserve list. The Finance Office verifies the bank details of approved applicants before releasing funds. If verification fails, applicants must correct their information within five working days. Otherwise, the funding offer is suspended, and the Research Director makes the final decision.

Applicants can track their proposal status, but reviewers cannot see each other's scores before submitting their own evaluations. The system must maintain an audit log of all decisions, revisions, status changes, and funding transactions. Notifications must be sent whenever an action is required from an applicant, reviewer, committee member, or finance officer.

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| 1(a). | Analyze the development requirements of the Smart Research Grant and Ethics Approval System and recommend the most suitable Software Development Life Cycle (SDLC) model. Justify your selection with at least three reasons based on the scenario. Also, explain one limitation of your chosen model and how it could be addressed. | [4] | CO1 |
| 1(b). | From the given scenario, identify three functional and two non-functional requirements. Rewrite the statement "The system should be efficient" as a measurable non-functional requirement. | [2] | CO1 |
| 2. | Construct a complete UML Use Case Diagram for the proposed system. Your diagram must include the relevant actors, use cases, system boundary, and appropriate include and extend relationships. | [6] | CO2 |
| 3. | Illustrate the use case descriptions for the following system functionalities:<br>i. Research Proposal Review: Reviewing submitted proposals, assigning reviewers, recording evaluation scores, and determining the final score.<br>ii. Funding Administration: Managing budget allocation, maintaining the reserve list, and verifying applicants' bank details before releasing funds. | [5] | CO1 |

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| 4. | Draw a GUI for the dashboard of the Smart Research Grant and Ethics Approval System. Including the proposal status, funding information, and critical issues notification. | [3] | CO2 |
| A customer browses a food delivery application, selects food items, adds them to the cart, and confirms the order. The system calculates the total cost and requests online payment. If the payment is successful, the system confirms the order and notifies the restaurant. If the payment fails, the system displays an error message and cancels the order.<br>After an order has been confirmed, the customer may request cancellation. The system checks whether the order is eligible for cancellation. If cancellation is allowed, the system cancels the order, updates the order status, and initiates a refund if payment has already been completed. Otherwise, the system displays a message stating that the order cannot be cancelled. | | | |
| 5(a). | Draw an activity diagram for the Place Food Order process based on the given scenario. Your diagram should include different nodes and activities. | [2] | CO2 |
| 5(b). | Draw a sequence diagram for the Cancel Food Order process based on the given scenario. Your diagram should include appropriate objects, lifelines, activation bars, synchronous messages and return messages. | [3] | CO2 |