JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.Tech I Semester Regular Examinations, January 2026

MULESOFT INTEGRATION & DATAWEAVE

(Computer Science and Engineering)

Time: 3 Hours **Max. Marks: 70**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 9 marks.

PART - A

(25 Marks)

1. **[2M]** Define API-led connectivity. Name the three layers involved.
2. **[3M]** Explain the purpose of the `X-Correlation-ID` header in a distributed transaction.
3. **[2M]** What is the output of the DataWeave expression: `"Hawkins" ++ " " ++ "Lab"`?
4. **[3M]** Differentiate between `map` and `mapObject` in DataWeave with a one-line example for each.
5. **[2M]** Why is a System API considered the "Gatekeeper" of backend data?
6. **[3M]** In the context of transaction tracking, what is "Split Brain" logging, and how do you prevent it?
7. **[2M]** Write a DataWeave script to handle a null `payload.power` field by defaulting it to "None".
8. **[3M]** Explain the use of the `pluck` operator. How would you use it to extract all keys from an object?
9. **[2M]** Why should Experience APIs never call System APIs directly in a mature architecture?
10. **[3M]** What is the output of: `[1, 2, [3, 4]] reduce ((item, acc = []) -> acc ++ flatten([item]))`?

PART - B

(45 Marks)

UNIT - I

11. a) [5M] You are designing the security architecture for Hawkins National Laboratory. Illustrate the API-led connectivity approach for a "Demogorgon Sighting" system. Define the responsibilities of the System, Process, and Experience layers for this specific use case.
b) [4M] Explain the request flow when a scientist reports a sighting via a Mobile App, ensuring the data reaches the secure mainframe.

OR

12. [9M] "Without Transaction Tracking, a distributed system is a Black Box." Justify this statement. Detailed the step-by-step implementation of generating, logging, and propagating a Correlation ID through three Mule flows.

UNIT - II

13. [9M] *Scenario: The Mind Flayer's Hive Mind.* You have received a chaotic JSON object representing the Hive Mind's connected hosts.

```
{ "hosts": { "Billy": "Flayed", "Heather": "Flayed", "Mike": "Safe" }
   }
```

Write a DataWeave script to: 1. Filter out the "Safe" hosts. 2. Transform the remaining data into an Array of Objects: `["name": "Billy", "status": "Flayed", ...]` 3. Add a timestamp field `scannedAt` with the current time.

OR

14. a) [5M] Explain the `groupBy` operator. How would you use it to categorize a list of radio frequencies by "Clear" vs. "Static" signals?
b) [4M] Given the array `[10, 20, 30]`, write a script using `map` to multiply each element by 2, and then use `filter` to keep only results greater than 30.

UNIT - III

15. [9M] *Scenario: Cerebro's Encryption.* You are intercepting Russian transmissions. The data format is XML with attributes:

```
<message encryption="high" id="99">
  <content>The gate is open</content>
</message>
```

Write a DataWeave script to transform this into JSON.

- Extract the `encryption` attribute.
- If encryption is "high", mask the content to "***".
- If ID is "99", add a field `priority: "URGENT"`.

OR

16. **a) [5M]** Discuss the importance of Type Coercion in DataWeave. How do you safely convert a String "100" to a Number, handling potential nulls?
b) [4M] Write a script to merge two arrays: `names = ["Will", "Lucas"]` and `roles = ["Wizard", "Ranger"]` into a single object `"Will": "Wizard", "Lucas": "Ranger"`.

UNIT - IV

17. **[9M]** *Scenario: The Upside Down Timeline.* A portal opens in Hawkins (EST) at "2026-11-06T22:00:00". Calculate: 1. The time in California (PST) where Eleven is located. 2. The time in Russia (MSK, +3 UTC) where Hopper is located. 3. The duration between the portal opening and "now". Show the DataWeave logic for these time manipulations.

OR

18. **a) [5M]** Explain the concept of Custom Functions in DataWeave. Define a function `formatCode(code)` that upper-cases a string and appends "-HAWKINS".
b) [4M] Using the `update` operator (or functional equivalent), show how to modify a specific field `status` in a payload from "Pending" to "Closed" without rewriting the whole object.

UNIT - V

19. **[9M]** Compare and contrast the "System Layer" and the "Process Layer". Why do we need a separate Process layer if the Experience layer can just call the System layer directly? Use the "Starcourt Mall" example (Customers + Inventory = Sales) to illustrate your answer.

OR

20. **[9M]** *Scenario: Vecna's Curse (Recursive Logic).* You have a nested employee object where each Manager has a list of 'reports', and those reports have 'reports'. Write a **Recursive DataWeave function** that flattens this hierarchy into a single list of all employee names, regardless of how deep the reporting structure goes.