



# RAN-2111040103020002

## MCA (Sem. - III ) Examination November - 2025

### Design Patterns (Paper - 302)

**Time: 3 Hours ]**

**[ Total Marks: 70**

**સૂચના : / Instructions**

(1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.

Fill up strictly the above details on your answer book.

Seat No.:

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Student's Signature

**Q. 1. A. Answer the following in short (Any TWO)**

**(08)**

1. State and explain the situations where the Abstract Factory pattern is suitable, using relevant examples.
2. Builder pattern is related with which other patterns? Explain.
3. How is Singleton pattern different from all other patterns? Explain.
4. Program to an Interface rather than to an implementation. Explain the statement.

**Q. 1. B. Show the classification of Design patterns; using a diagram.**

**[06]**

**Q. 2. Attempt the following:**

- A. Explain the standard template of the Design pattern, as made by the GOF. **[07]**
- B. Discuss the SOLID principles, with examples. **[07]**

**OR**

- B. Some designs start by using Factory pattern and evolve toward Abstract- Factory/ Prototype/Builder. Justify the statement using relevant example.

**Q. 3. Attempt the following (Any TWO):**

**[14]**

1. Explain the Bridge pattern along with its structure.
2. With any ONE use case of your choice, show how would you use design patterns for effective design.
3. Explain NULL pattern and its use, with an example.

**Q. 4. Attempt the following:**

- A. Explain Adapter design pattern along with its structure. **[07]**

**OR**

- A. Explain the Command design pattern, along with its structure. **[07]**
- B. Explain Chain of Responsibility design pattern; highlighting the steps to implement it. **[07]**

**Q. 5. Attempt the following (Any TWO):**

**[14]**

1. Explain the similarity and differences between Mediator and Facade patterns.
2. Explain the role of patterns in Agile Software development.
3. List the pros and cons of Prototype pattern.