Reg. No. :

Question Paper Code: R2102

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

Professional Elective

R21CSV102- RECOMMENDER SYSTEM

(Regulations R2021)

(Common to CSE and IT Engineering Branches)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. What is the difference between explicit and implicit feedback?   CO1 - U

2. List two types of recommender systems?   CO1 - U

3. How are item profiles represented in content-based systems?   CO1 – U

4. Define user profile in content-based filtering.   CO1 – U

5. What is the sparsity problem in collaborative filtering?   CO1 – U

6. Find Jaccard similarity between sets A = {M1, M2, M3} and   CO2 – App
    B = {M2, M3, M4}.

7. Explain the Bandwagon attack with an example.   CO1 – U

8. Define shilling attack. Give one real-world example.   CO1– U

9. Given relevance scores for items {3, 2, 0, 1}, compute DCG and nDCG at 4.   CO2 - App

10. Explain Precision, Recall and F1-score in recommender system evaluation.   CO1 – U

PART – B (5 x 16= 80 Marks)

11. (a) Illustrate the impact of similarity measures on the quality of   CO2 -App   (16)
        recommendations. discuss with real time applications.

Or

    (b) Apply Singular Value Decomposition (SVD) on a movie rating   CO2 -App   (16)
        dataset and show how latent factors (e.g., user taste, movie type)
        can be derived to improve recommendations.

12. (a) What is TF-IDF? How is it used in content-based filtering to represent items? Explain with an example. — CO1 –U — (16)

Or

(b) Compare similarity –based retrieval and classification-based retrieval in content-based systems — CO1 –U — (16)

13. (a) Determine the Content-Based Filtering approach in recommender systems. Explain how item representation and user profiles are created. Discuss the role of similarity measures in making recommendations. Also, mention the advantages and disadvantages of this approach.0 — CO1 -U — (16)

Or

(b) Explain user-based and item-based collaborative filtering techniques. How are similarity measures used in each case? Illustrate with suitable examples. Also, discuss the advantages and limitations of both approaches. — CO1 -U — (16)

14. (a) Design a context-aware mobile recommender for tourism that considers season, budget, group size, and location. Explain the recommendation process step by step. — CO2 -App — (16)

Or

(b) Develop a hybrid recommender system to overcome cold start and data sparsity issues in a music streaming platform. Apply weighted, switching, or cascade hybridization with examples. — CO2 -App — (16)

15. (a) Apply big data frameworks (like Hadoop/Spark) to design a scalable recommender system for an e-commerce platform. Explain the workflow and advantages. — CO2 -App — (16)

Or

(b) Build a large-scale recommender system for Netflix using distributed computing. Explain how to overcome scalability and sparsity problems. — CO2 -App — (16)

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