VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

REG.NO.: 0459

SLOT: E1+TE1

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
WINTER SEMESTER 2025-2026

Programme Name & Branch	: B.Tech – COMPUTER SCIENCE AND ENGINEERING
Course Code and Course Name	: BCSE334L and Predictive Analytics
Faculty Name(s)	: Dr. Helen Sharmila A
Class Number(s)	: VL2025260502245
Date of Examination	: 31-01-2026
Exam Duration	: 90 minutes

Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- Course Outcomes (Type the CO statements covered in this question paper. Use the CO number as per the syllabus copy)
  CO1 - Understand the importance of predictive analytics and processing of data for analysis.

Q. No	Question	Module	Marks	CO	BL
1.	A city administration plans to optimize traffic signal timings using data on vehicle flow, congestion levels, and accident history. Explain which business analytics model is most appropriate and how analytical techniques can assist in decision-making.	1	10	1	1
2.	A bank collects customer data such as income, spending patterns, credit score, and past loan repayment history. The bank aims to group customers into risk categories (low, medium, and high risk), predict whether a new customer will default on a loan, and decide on loan approval along with an appropriate interest rate. Tasks: a) Identify the type of model used at each stage (descriptive, predictive, or decision). b) Suggest a suitable analytical technique for each stage.	1	10	1	2
3.	The values of a predictor variable Exam Scores are: 45 55 65 75 85 a) Apply centering to the data. b) Apply scaling using standard deviation. c) Apply Min–Max normalization to scale the data to the range [0,1]. d) Compare the effect of scaling and normalization.	2	10	1	2
4.	Using the SIRS abnormal thresholds: Temperature (Temp): < 36°C or > 38°C Heart Rate (HR): > 90 beats/min Respiratory Rate (RR): > 20 breaths/min White Blood Cell Count (WBC): < 4000 or > 12000 cells/mm³				

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	Classify each patient as SIRS = Yes or No, where SIRS = Yes if two or more parameters are abnormal. Dataset: Patient | Temp (°C) | HR (bpm) | RR (breaths/min) | WBC (cells/mm³) P1 | 39.0 | 95 | 22 | 13000 P2 | 37.1 | 88 | 21 | 8000 P3 | 35.5 | 92 | 18 | 3500 P4 | 38.5 | 85 | 19 | 9000 P5 | 36.8 | 110 | 24 | 3000 Task: Bin values as Normal/Abnormal and decide SIRS Yes/No for each patient.	2	10	1	3
5.	A dataset contains 180 patient records with a rare disease prevalence of 25%. To evaluate model performance, the data scientist considers k-fold cross-validation, LOOCV, repeated cross-validation, and bootstrap resampling. Compare these resampling techniques in terms of bias–variance trade-off, computational cost, and reliability of performance estimates. Explain how stratification and repeated resampling improve robustness when data is limited.	2	10	1	3

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temp - 36 - 38
HR < 90
RR < 20
4000 - ~~12000~~ 12000