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Question Paper Code	12789
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024**

Fourth Semester

**Artificial Intelligence and Data Science**

**20AIPC403 – ADVANCED MACHINE LEARNING**

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

	Marks	K-Level	CO
1. Differentiate interpolation and extrapolation with a neat diagram.	2	K2	CO1
2. When can an Underfitting and Overfitting will occur?	2	K1	CO1
3. Point out the trade-off faced in representation learning problems.	2	K2	CO2
4. Define junction tree calibration.	2	K1	CO2
5. Draw the functional diagram for variational auto encoder.	2	K1	CO3
6. Predict the primary disadvantage of the non-parametric encoder.	2	K2	CO3
7. List the two new methods for density estimation using multilayer networks.	2	K1	CO4
8. Characterize the autoregressive model in density estimator.	2	K2	CO4
9. Summarize the difference between Standard neural network and Bayesian neural network.	2	K2	CO5
10. Define Meta learning.	2	K1	CO5

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) Define Bayesian networks and illustrate the concept of occurrence of burglary with its probabilities.	13	K2	CO1
<b>OR</b>			
b) Explain your understanding of Conditional Random Field (CRFs) and list out the advantages.	13	K2	CO1
12. a) Summarize the junction tree. Explain how the junction tree algorithm can be applied on chain structured graphs.	13	K2	CO2
<b>OR</b>			
b) Describe about learning conditional graphical models with examples.	13	K2	CO2
13. a) Outline in detail about Generative Adversarial Networks (GAN) with suitable examples.	13	K2	CO3

*K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create*

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**OR**

b) Explain in detail about Markov Chain Monte Carlo (MCMC) methods with suitable examples. 13 K2 CO3

14. a) Elaborate briefly about masked autoregressive flow for density estimation. 13 K2 CO4

**OR**

b) Discuss in detail about masked auto-encoder for distribution estimation. 13 K2 CO4

15. a) Describe briefly about how autoregressive recurrent networks is used in probabilistic modeling. 13 K2 CO5

**OR**

b) Compare and Contrast the meta-learning, counterfactual reasoning, causality. 13 K2 CO5

**PART - C (1× 15 = 15 Marks)**

16. a) Illustrate about encoder-decoder model for multivariate time series forecasting. 15 K2 CO6

**OR**

b) Discuss in detail about high-dimensional multivariate forecasting. 15 K2 CO6