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PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2022
(Fifth Semester)

Branch – **COMPUTER SCIENCE WITH DATA ANALYTICS**

MACHINE LEARNING

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 x 1 = 10)

1 Application of Machine learning is --------.
(i) email filtering (ii) sentimental analysis
(iii) face recognition (iv) all of the above

2 How do you perform Bayesian classification when some features are missing?
(i) Assuming the missing values as the mean of all values.
(ii) Ignore the missing features.
(iii) integrate the posteriors probabilities over the missing features
(iv) drop the features completely.

3 Residual ------ plots investigate normality of the errors.
(i) RR (ii) PP
(iii) QQ (iv) None of the above

4 Which of the following can be useful for diagnosing data entry errors?
(i) hat values (ii) dffit
(iii) resid (iv) all of the above.

5 What symbol represents the test statistic for the Mann-Whitney test?
(i) Ws (ii) T
(iii) U (iv) H

6 D is the _____ in the model $D=b_0+ b_1 X_1+ b_2 X_2+ b_3X_3+...+ b_kX_k$.
(i) discriminant score (ii) disordinal interaction
(iii) difference variable (iv) discriminant coefficients or weights

7 Match List I and List II

	List I		List II
A	Bayes' Theorem	I	$P(\bar{E}) = 1 - P(E)$
B	Conditional Probability	II	$P(E_1 \cup E_2) = P(E_1) + P(E_2)$
C	Theorem of Complementary event	III	$P(E_2/E_1) = \frac{P(E_1 \cap E_2)}{P(E_1)}$
D	Theorem of addition	IV	$P\,H_1/E = \frac{P(H_1 \cap E)}{P(E)}$

Choose the correct answer from the options given below:
(i) A-I, B-IV, C-III, D-II (ii) A-III, B-IV, C-II, D-I
(iii) A-III, B-IV, C-I, D-II (iv) A-IV, B-III, C-I, D-II

8 What is the use of the Hidden Markov Model?
(i) Speech recognition (ii) Understanding of the real world
(iii) Both (i) and (ii) (iv) None of these

Cont...

9 Which of the following statement is true in following case?
(i) Feature F1 is an example of nominal variable
(ii) Feature F1 is an example of ordinal variable
(iii) It doesn't belong to any of the above category
(iv) Both of these

10 Which of the following is an example of a deterministic algorithm?
(i) PCA (ii) K-Means
(iii) None of the above (iv) Both of these

SECTION - B (25 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 5 = 25)

11 a What are the different types of Machine Learning?

OR

b How is KNN different from K-means clustering?

12 a Define Multivariate regression with its characteristics. Explain with steps to achieve it.

OR

b Summarize Linear Discriminant analysis.

13 a Differentiate Parametric and non-parametric method.

OR

b Describe about Gradient Descent.

14 a What is parameter estimation? Explain the types of parameter estimation.

OR

b State Hidden Markov model in detail.

15 a Describe Response surface designs.

OR

b What is hypothesis testing in ML? Summarise the steps.

SECTION -C (40 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 8 = 40)

16 a Summarize Regression model in detail.

OR

b Explain in detail about Maximum Likelihood Estimation.

17 a State in detail the estimation of Missing values.

OR

b Summarise Multivariate Normal Distribution in detail.

18 a Narrate nonparametric regression smoothing models in detail.

OR

b Describe the parametric discrimination revisited in detail.

19 a Explain the use of basis/kernel functions in bayes estimation.

OR

b State continuous observations of learning model in detail

20 a Compare two classification algorithms in detail.

OR

b Summarize cross validation and Resampling methods in ML.

Z-Z-Z END