

## Mathematics-3B Quiz

All Questions carry 1 mark each. Choose the appropriate answer for the given options. No negative marks for wrong answers.

\*Required

1. Email address \*

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2. Roll No \*

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3. Let A, B, C be three events such that  $P(B)$  &  $P(C)$  are non-zero and  $P(A) = 0$ , then events A, B, C are

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- ☒ Independent  
☐ Pairwise Independent but not Totally Independent  
☐  $P(A) = P(B) = P(C)$   
☐ None of these

4. If  $P(A) > 0$  then

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$$P(AB | A) \geq P(AB | A \cup B)$$

$$P(AB | A) \leq P(AB | A \cup B)$$

☐ Option 1

☐ Option 2

☐ Both of the above

☐ None of the above

5. Which of the following obey/obeys the Poisson Probability Law ?

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- ☐ The number of misprints on a page of book.  
☐ The number of people in a community who survive to age 100.  
☒ Both of them  
☐ None of them

6. If 'p' and 'q' are the probability of success and failure of an even in single trial then  $1/p + 1/q$  is

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- ☐ 1  
☒  $1/pq$   
☐  $pq$   
☐  $p+q$

7. If  $E(0.26+0.02)=0.28$  then  $\text{Var}(0.28)=$

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- ☒ 0.28  
☐ 0.2  
☐ 0  
☐ 0.26

8. The joint density function of X and Y is given by

$$f(x, y) = \begin{cases} 2e^{-x}e^{-2y}, & 0 < x < \infty \\ 0, & \text{otherwise} \end{cases} \text{ then } P(X < a) \text{ is}$$

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$$1 - e^a$$

☐ Option 1

$$e^a - 1$$

☐ Option 2

$$1 - e^{-a}$$

☐ Option 3

$$e^{-a} - 1$$

☐ Option 4

9. The Expectation of the Sample Mean is equal to

Mark only one oval.

☐ 0

☐ 1

☒ Mean of the Distribution.

☐ None of these.

10. In a normal curve, the measures of central tendency

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☐ can never be equal.

☒ are always equal.

☐ mean and median are equal but not mode.

☐ mean and mode are equal but not median.

11. In which of the following Mean and Variance will have the same value always ?

Mark only one oval.

☐ Normal Distribution.

☐ Binomial Distribution.

☒ Poisson Distribution.

☐ Joint Distribution.

12. Markov Chain is a type of

Mark only one oval.

☐ continuous- time chain.

☒ discrete-time chain.

☐ both of the above.

☐ None of the above.

13. The Mathematical Modelling tool widely used for Image Processing is/are

Mark only one oval.

☐ A. Markov Chains.

☐ B. Linear Algebra.

☒ Both A and B.

☐ Neither A nor B.

14. Data mining, speech recognition, vision, artificial intelligence, etc. have the basis of their algorithm based on

Mark only one oval.

- ☐ Probability Theory.
- ☐ Statistics.
- ☒ Probability and Statistics.
- ☐ None of the above.

15. Type-I error also known as producer's risk occurs when

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- ☐ the null hypothesis is not true but we accept it
- ☐ the null hypothesis is true and we accept it
- ☐ the null hypothesis is not true and we reject it
- ☒ the null hypothesis is true but we reject it

16. Which of the following is/are not true ?

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- ☐  $\text{Cov}(X,Y)=\text{Cov}(Y,X)$
- ☐  $\text{Cov}(X,X)=\text{Var}(X)$
- ☐  $\text{Cov}(aX,Y)=a\text{Cov}(X,Y)$
- ☒  $\text{Cov}(aX,Y)=\text{Cov}(X,Y)$

17. When we want to test a null hypothesis about the relationship between two variables then we are going to use

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- ☐ student t-test.
- ☐ chi-square test.
- ☒ Both of them.
- ☐ None of them.

18. Leptokurtic is a term associated with

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- ☐ negative excess Kurtosis.
- ☒ positive excess Kurtosis.
- ☐ non-negative excess Kurtosis.
- ☐ zero excess Kurtosis.

19. If S and K denotes the Skewness and Kurtosis respectively for a Normal Distribution then

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- ☐ S is non-zero and  $K=0$ .
- ☐  $S=0$  and K is non-zero.
- ☐  $S=3$  and  $K=0$ .
- ☒  $S=0$  and  $K=3$ .

20. Correlation coefficient is

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- ☐ asymmetric in nature.
- ☐ anti-symmetric in nature.
- ☒ symmetric in nature.
- ☐ None of the above.

21. The general problem of finding equations of approximating curves which fit given data is based on

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- ☐ Skewness.
- ☐ Kurtosis.
- ☒ Method of Least Square.
- ☐ Regression Analysis.

22. The predictive modelling technique which investigates the relationship between dependent and independent variable and due to this nature find itself widely used in Machine Learning is

Mark only one oval.

- ☐ Correlation Analysis.
- ☐ Skewness and Kurtosis Analysis.
- ☒ Regression Analysis.
- ☐ All of the above.

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