

Ph.D. Entrance Exam 2022

Course	Ph.D.
Branch	Mathematics
Subject Name	Mathematics

SN	Question Text	Option 1	Option 2	Option 3	Option 4
1	What is probability of drawing two clubs from a well shuffled pack of 52 cards?	13/51	1/17	1/26	13/26
2	On rolling a dice 2 times, the sum of 2 numbers that appear on the uppermost face is 8. What is the probability that the first throw of dice yields 4?	2/36	1/36	1/6	1/5
3	Nature of the binomial random variable X is:	Quantitative	Qualitative	Discrete	Continuous
4	The mean and standard deviation of the binomial probability distribution 'are respectively:	np and npq	n and p	np and nq	None of these
5	Three companies A, B and C supply 25%, 35% and 40% of the notebooks to a school. Past experience shows that 5%, 4% and 2% of the notebooks produced by these companies are defective. If a notebook was found to be defective, what is the probability that the notebook was supplied by A?	$44/69$	$25/69$	$13/24$	$11/24$
6	Sample is a sub-set of	Population	Data	Set	Distribution
7	Standard deviation of sampling distribution of a statistic is called	Serious error	Dispersion	Standard error	Difference
8	Mean of a random variable X is given by	$E(X)$	$E(X^2)$	$E(X^2) - (E(X))^2$	$(E(X))^2$
9	$E(X) = \mu$ and $V(X) = \sigma^2$ is for which distribution?	Bernoulli's	Binomial	Poisson's	Normal
10	The remainder when $1!+2!+3!+4!+\dots+100!$ is divided by 12 is	7	9	1	0
11	The number 5233779 is divisible by.....	7	9	4	2
12	The product of LCM and GCD of two integers a and b is equal to the	alb	a+b	a-b	a.b
13	Integers x, y of linear combination of gcd(119, 227) are.....	x=7, y=-3	x=4, y=3	x=-7, y=-3	x=-7, y=3
14	Every square number is of the form	9k or 3k+1	3k or 9k+1	3k or 3k+1	9k or 9k+1
15	If two numbers divided by same number and give same remainder, those numbers said	perfect numbers	parity	proper divisors	improper divisors
16	By using principal of finite induction, verify the statement : $1(1!)+2(2!)+\dots+n(n!)=(n+1)!$	Incorrect	correct		
17	Least positive integer to which 282 is congruent: $282 \equiv \dots \pmod{11}$	7	11	3	5
18	$66x \equiv 8 \pmod{78}$ possess a solution	true	FALSE		

19	Solution of the system of linear congruence: $x \equiv 3 \pmod{11}$, $x \equiv 5 \pmod{19}$, $x \equiv 10 \pmod{29}$	$4128 \pmod{6061}$	$4100 \pmod{6061}$	$4128 \pmod{209}$	$1653 \pmod{6061}$
20	When $r = +1$ it means there isrelationship between the variables.	Perfect positive relationship	Perfect negative relationship	Negative positive relationship	No correlation
21	The slope of the regression line of y on x is also called the:	Correlation coefficient of x on y	Regression coefficient of x on y	Correlation coefficient of y on x	Regression coefficient of y on x
22	The method of least squares dictates that we choose a regression line where the sum of the square of deviations of the points from the line is	Maximum	Zero	Minimum	Positive
23	If $y = 2 - 0.2x$, then the value of y intercept is equal to:	-0.2	$0.2x$	2	All of the above
24	A measure of the strength of the linear relationship that exists between two variables is called:	Slope	Correlation coefficient	Intercept	Regression equation
25	When two regression coefficients bear same algebraic signs, then correlation coefficient is:	Positive	According to two signs	Negative	Zero
26	When b_{xy} is positive, then b_{yx} will be:	Negative	Zero	Positive	One
27	If both variables x and y increase or decrease simultaneously, then the coefficient of correlation will be:	Positive	Zero	Negative	Zero
28	If $y = -10x$ and $x = -0.1y$, then r is equal to:	0.1	-1	1	10
29	In correlation problem both variables are:	Equal	Unknown	Fixed	Random
30	The arithmetic mean of the two regression coefficients is greater than or equal to:	-1	0	1	R
31	The bisection method is also known as	Binary chopping	Tri region chopping	Quaternary chopping	Hex region chopping
32	_____ is used to denote the process of finding the values inside the interval (x_0, x_n)	Interpolation	Extrapolation	Iterative	Polynomial equation
33	An unequal intervals, we can use _____ to get the derivative value	Newton forward interpolation formula.	Newton backward interpolation formula.	Newton forward difference formula	Lagrange's interpolation formula
34	An integral equation is said to be singular when	One limit of integration become infinite	Both limits of integration become infinite	Kernel becomes infinite at one point under the interval	All of these
35	If the equation is not exact, then it can be solved by multiplying it with	Common factor	Any function of y	Any function of x	Integrating Factor
36	A set is enumerable, if it is	Finite	Infinite	Countable	Countably infinite
37	Which of the following statements is true	Every subset of countable set is uncountable.	Every subset of countable set is uncountable.	The countable union of countable sets is countable	The product of two countable sets is uncountable.
38	A set is countable iff its elements can be written in	Sequence	series	union	intersection
39	Which is not a property of metric space	Symmetric	Triangle Inequality	Reflexive	Positive definite
40	Which of the following statement is false, for open sets	Finite intersection of open sets is open	Arbitrary union of open sets is open	Intersection of infinite open sets is open	Every open sphere is an open set
41	In a metric space (X, d) , a subset of X is closed if	It contains all its interior points	If it contains all open spheres	If it contains all its closed spheres	If it contains all limit points

42	Which statement is not true for order property of real numbers	The order relation $<$ has the least bound property	If $x < y$, there exist an element z such that $x < z$ and $z < y$.	$d(x,y) < d(x,a) + d(a,y)$	If $x > y$, then $x+z > y+z$
43	According to Cantor theorem	Each non empty set that is bounded above has a supremum	Each irrational number is transcendental	$\inf A$ and $\sup A$ may or may not be member of A	No set X can be equivalent to its power set
44	If a set T is the collection of all the subsets of X then T is	Discrete Topology	Indiscrete Topology	Cofinite Topology	Coarser Topology
45	If $X = \{1,2,3,4,5\}$ then how many elements will discrete topology have	32	16	8	5!
46	For which topology, the topological space is known as Sorgenfrey line	Usual Topology	Upper limit topology	Lower limit topology	Discrete topology
47	If any point of X is neither interior nor exterior point of subset of A , then it is	Frontier point	Neighbourhood point	Closure point	Limit point
48	The topological space $(\mathbb{R}, \mathcal{U})$ is	First countable	Second countable	Uncountable	Both first and second countable
49	If in a topological space (X, \mathcal{T}) , every subset of X is either \mathcal{T} -open or \mathcal{T} -closed then	(X, \mathcal{T}) is door space	(X, \mathcal{T}) is subspace	(X, \mathcal{T}) is discrete space	(X, \mathcal{T}) is usual space
50	A closed curve beyond which it is not possible to take analytic continuation is called:	Singularity	closed boundary	natural boundary	open boundary