Program: Civil Engineering
Curriculum Scheme: Rev2012/Rev2016
Examination: Second year/ Semester IV
Course Code: CE C-401 and Course Name: Applied Mathematics-IV

Time: 1 hour   Max. Marks: 50

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For the students:- All the Questions are compulsory and carry equal marks .

Q1.	Consider a dice with the property that that probability of a face with n dots showing up is proportional to n. The probability of face showing 4 dots is?
Option A:	1/7
Option B:	5/42
Option C:	1/21
Option D:	4/21
Q2.	X is a variate between 0 and 3. The value of $E(X^2)$ is
Option A:	8
Option B:	7
Option C:	9
Option D:	27
Q3.	A T-test sample has 7 pairs of samples. The distribution should contain
Option A:	5
Option B:	9
Option C:	6
Option D:	0
Q4.	Find the population proportion p for an IPL team having total 30 players with 10 overseas players.
Option A:	½
Option B:	1/3
Option C:	2/3
Option D:	1/4
Q5.	If 40% of boys opted for math's and 60% of girls opted for maths, then what is the probability that math's is chosen if half of the class's population is girls?
Option A:	0.5
Option B:	0.6
Option C:	0.7
Option D:	0.4
Q6.	If E(x) = 2 and E(z) = 4, then E(z – x) =?
Option A:	2
Option B:	6
Option C:	0
Option D:	-2
Q7.	For a Poisson Distribution, if mean(m) = 1, then P(1) is?

Option A:	e
Option B:	1/e
Option C:	e/2
Option D:	0
Q8.	Which of the following is not a necessary condition for a matrix, say A, to be diagonalizable?
Option A:	A must have n linearly independent eigen vectors
Option B:	All the eigen values of A must be distinct
Option C:	A can be an idempotent matrix
Option D:	A must have n linearly dependent eigen vectors
Q9.	The determinant of the matrix whose eigen values are 4, 2, 3 is given by
Option A:	19
Option B:	24
Option C:	15
Option D:	23
Q10.	Find the trace of the matrix A=[1 0 6 0 5 0 0 4 4]
Option A:	0
Option B:	14
Option C:	10
Option D:	11
Q11.	Find the Value of A^3 where A=[−1 − 1 2 0 1 − 1 2 2 1]
Option A:	[3 5 − 1 − 2 − 9 2 − 2 − 4 − 5]
Option B:	[[3 5 − 1 1 − 9 1 − 2 − 4 − 5]]
Option C:	[[3 5 − 1 − 2 − 9 1 − 2 − 4 − 5]]
Option D:	[3 5 − 1 − 1 − 9 1 − 2 − 4 − 5]
Q12.	Find the Eigenvalues and type of the given matrix [3 10 5 − 2 − 3 − 4 3 5 7]
Option A:	3, 1, 3 Non Derogatory
Option B:	2, 2, 2 Derogatory
Option C:	3, 2, 2 Derogatory
Option D:	1, 2, 3 Non Derogatory
Q13.	A sample size is considered large in which of the following cases?
Option A:	n > or = 30
Option B:	n > or = 50
Option C:	n < or = 30
Option D:	n < or = 50
Q14.	Rank correlation coefficient was discovered by
Option A:	Fisher
Option B:	Spearman
Option C:	Karl Pearson
Option D:	Bowley

Q15.	A random variable X may have no moments although its M.G.F is
Option A:	Not exist
Option B:	Exist
Option C:	1
Option D:	0
Q16.	In a Simplex table, the pivot row is computed by
Option A:	dividing every number in the profit row by the pivot number.
Option B:	dividing every number in the pivot row by the corresponding number in the profit row.
Option C:	dividing every number in the pivot row by the pivot number.
Option D:	dividing every number in the net profit row by the corresponding number in the gross profit row.
Q17.	A bag contains 80 chocolates. This bag has 4 different colors of chocolates in it. If all four colors of chocolates were equally likely to be put in the bag, what would be the expected number of chocolates of each color?
Option A:	12
Option B:	11
Option C:	20
Option D:	19
Q18.	Find the Eigen values of matrix $[4\ 1\ 1\ 4\ ]$
Option A:	3,-3
Option B:	-3,-5
Option C:	3,5
Option D:	5, 0
Q19.	In a Binomial Distribution, if 'n' is the number of trials and 'p' is the probability of success, then the mean value is given by
Option A:	$np(1-p)$
Option B:	np
Option C:	n
Option D:	p
Q20.	A vector field which has a vanishing divergence is called as
Option A:	Solenoidal field
Option B:	Rotational field
Option C:	Hemispheroidal field
Option D:	Irrotational field
Q21.	Divergence and Curl of a vector field are
Option A:	Scalar & Scalar
Option B:	Scalar & Vector
Option C:	Vector & Vector
Option D:	Vector & Scalar
Q22.	If the probability of hitting the target is 0.4, find mean and variance.

Option A:	0.4, 0.24
Option B:	0.6, 0.24
Option C:	0.4, 0.16
Option D:	0.6, 0.16
Q23.	In testing the hypotheses $Ho: \mu = 50$ vs $Ha: \mu \neq 50$, the following information is knows: $n = 64$, $\bar{x}=53.5$ and $\sigma = 10$. The standardized test statistic is:
Option A:	$t = 2.8$
Option B:	$t = -2.8$
Option C:	$z = 2.8$
Option D:	$z = -2.8$
Q24.	If the coefficient of determination is equal to 1, then the correlation coefficient
Option A:	must also be equal to 1
Option B:	can be either -1 or +1
Option C:	can be any value between -1 to +1
Option D:	must be -1
Q25.	Maximize: 7X1 +3X2 Subject to : 5X1 +7X2 $\leq$ 27, 4X1 +X2 $\leq$ 14, 3X1 -2X2 $\leq$ 0 X1 ,X2$\geq$0
Option A:	integer programming problem.
Option B:	goal programming problem.
Option C:	nonlinear programming problem.
Option D:	None of the above