PACIFIC UNIVERSITY

PACIFIC ACADEMY OF HIGHER EDUCATION AND RESEARCH UNIVERSITY, UDAIPUR

SECTION – B

Mathematical Sciences

Max. Marks – 100

Roll No. (in figures) _____

Roll No. (in words) _____

Signature of the Candidate _____

Signature of Invigilator's 1. _____ 2. _____

Instruction for Candidates:

Attempt all 50 questions, each question carry 02 marks. There is no negative marking. Please mark the correct answer as A/B/C/D at appropriate place, on the right hand side of the question, in blue or black ink.

Q.1 The radii of convergence of the power series is

(A) 1 (B) 3 (C) 2 (D) 4 ( )

Q.2 Ratio test fails if the

(A) equal to 1
(B) greater than 1
(C) less than 1
(D) none of the these ( )

Q.3 If f(z) is analytic within and on a closed contour C,and a is any point within C,then

is the statement of

(A) liouville's theorem (B) Cauchy's theorem
(C) Cauchy's integral formula (D) Open mapping theorem ( )

Q.4 The residue of at z=ia is

A) z = ia (B) z = ia/2 (C) z = ia/4 (D) z = 2ia ( )

Q.5 In how many different ways can the letters of the word 'CORPORATION' be arranged so that the vowels always come together?

(A) 810 (B) 50400 (C) 2880 (D) 1440 ( )

Q.6 A relation between the variables which satisfies the equation and which contains as many arbitrary constants as there are independent variables in the equations is known as

(A) Particular Integral (B) Singular integral
(C) General integral (D) Complete integral ( )

Q.7 The singular solution of the equation Y= Px +

(A) y-k=4ax (B) (y+k)2=4ax
(C) (y- k)2=4ax (D) y+k=4ax ( )

Q.8 In general, singular solution of the equation in the form

(A) f(x, p, c)=0 (B) f(y,p,c)=0
(C) f (x,y,c) =0 (D) f(x,y,p)=0 ( )

Q.9 Iteration method based on first degree equation is

(A) Newton Raphson method (B) Bisection method
(C) Lin-Bairstow's method (D) Graphical method ( )

Q.10 The Rate Of convergence of Bisection method is

(A) 1 (B) 3/2 (C) 1.618 (D) ½ ( )

Q.11 Simpson's 3/8 can be applied when the range is divided into a number of subintervals which must be a multiple of

(A) 2 (B) 3 (C) 6 (D) 4 ( )

Q.12 The set of all even permutation of degree n is a group of order

(A) n! (B) n!/2 (C) n (D) (n-1)! ( )

Q.13 Every finie group is isomorphic to some permutation group is a statement of

(A) cayley's theorem (B) Sylow theorem
(C) Chinese Remainder theorem (D) None of these ( )

Q.14 A mapping f of a ring R onto a ring R' is called homomorphism ,if for each a R, b R-

(A) f(a+b) = f(a) + f(b) (B) f(a+b) = f(a) - f(b)
(C) f(a.b) = f(a).f(b) (D) f(a+b) = f(a) + f(b) and f(a.b) = f(a).f(b) ( )

Q.15 An ideal which is a proper ideal of ring Z is a prime ideal iff

(A) P is prime (B) P is odd
(C) P is a multiple of 3 (D) P is even ( )

Q.16 If the matrix A = then A is

(A) Hamitian matrix (B) Skew-Hamitian matrix
(C) Unitary matrix (D) None of these ( )

Q.17 Let A be a square matrix and A^t be its transpose matrix then A- A^t ,is

(A) Symmetric matrix (B) Skew-Symmetric matrix
(C) Null matrix (D) Identity matrix ( )

Q.18 If A = then is

(A) 0 (B) 1 (C) 2 (D) Not defined ( )

Q.19 The equation

are

(A)Inconsistent (B) consistent and have unique solution
(C) consistent and have many solution (D) None of these ( )

Q.20 For differentiability of a function, continuity is

(A) Sufficient (B) Necessary
(C) Sufficient and Necessary (D) None of these ( )

Q.21 If f(x+y) = f(x).f(y) and f(5)= 2 ,f'(0) = 3 then the value of f'(5) is

(A) 0 (B) 3 (C) 6 (D) 5 ( )

Q.22 The Complete Integral of the equation z = pq is

(A) yz = ax +2 +b (B) (z-ay) = b(x^2-a^2)

(C) 2 = ax + y +c (D) 2 = yx + z+ c ( )

Q.23 The zero of the polynomial equation is the value of x where the graph of cross the

(A) x-axis (B) y-axis (C) z-axis (D) x-axis and y-axis ( )

Q.24 is equal to

(A) 0 (B) 1 (C) -1 (D) ( )

Q.25 The domain of a distribution function is

(A) (0,) (B) (- ,0) (C) (0,1) (D) (- ,) ( )

Q.26 Moment generating function about a point 'a'is…….. times moment generating function about origin

(A) e^{at} (B) e^{t} (C) e^{-at} (D) $e^{t/a}$

( )

Q.27 If a function f(z) is analytic for all values of finite value of z , and is bounded , is constant is a statement of

(A) Cauchy's theorem (B) Taylor's theorem

(C) Morea's theorem (D) Liouville's theorem ( )

Q.28 The optimal number of orders per year increases when

(A) Price increase (B) Carry cost decreases

(C) Total annual rupee value decreases (D) None of the above ( )

Q.29 From the following which is non parametric test

(A) Chi-square -test (B) t-test (C) z-test (D) F-test ( )

Q.30 Which of the following is not true of the simplex method

(A) At each iteration,the objective value either stays the same or improves.
(B) it indicates an unbounded or infeasible problem.
(C) it signals optimality,
(D) it converges in at most m steps,where m is the number of constraints. ( )

Q.31 Which of the following statements is false?
(A) The *t* distribution is symmetric about zero
(B) The *t* distribution is more spread out than the standard normal distribution
(C) As the degrees of freedom get smaller, the *t*-distribution's dispersion gets smaller
(D) The *t* distribution is mound-shaped ( )

Q.32. For statistical inference about the mean of a single population when the population standard deviation is unknown, the degrees for freedom for the *t* distribution equal *n*-1 because we lose one degree of freedom by using the:
(A) Sample mean as an estimate of the population mean
(B) Sample standard deviation as an estimate of the population standard deviation
(C) Sample proportion as an estimate of the population proportion
(D) Sample size as an estimate of the population size ( )

Q33. In testing the hypotheses
<<<EQUATION>>>Null hypothesis: mu = 200
<<<EQUATION>>>Alternative hypothesis: mu less than 200
the sample mean is found to be 120. The null hypothesis:
(A) should be rejected (B) should not be rejecte
(C) should be rejected only if $n > 30$ (D) none of the above answers is correct ( )

Q.34. The arrival of customers (with no departure) in system, in Queueing theory can be stated as
(A) the pure birth process (B) the pure death process
(C) both (a) & (b) (D) neither (a) nor (b) ( )

Q.35. If arrival rate is 3 customers/day and service rate is 5 customers/day for M/M/1 queueing systems. The expected number of customers in the system at certain day is
(A) 1.5 (B) 2 (C) 3 (D) 5 ( )

Q.36. If the interarrival time is exponential with mean $1/\lambda$ then the number of arrivals in (0, t) is
(A) poisson distributed (B) exponential distributed
(C) binomial distribute (D) None of these ( )

Q.37 In how many ways can 5 person be seated at a round table conference

(A) 100 (B) 120 (C) 103 (D) 150 ( )

Q.38 If then

(A) r = s (B) r + s = n
(C) either r = s or r + s = n (D) none of these ( )

Q.39 In the production lot size model ,increasing the rate of production

(A) Increase the optimal number of orders to place each year.
(B) Does not influence the optimal number of orders.
(C) Decrease the optimal number of orders to place each year
(D) None of the above ( )

Q.40 A queue is formed when

(A) Customers wait for services
(B) Service facilities stand idle and wait for customers
(C) Either A or B
(D) Both A and B ( )

Q.41 characterstics of queues such as "expected number in the system"
(A) Are relevant after the queue has reached a steady state
(B) Are probabilistic statement
(C) Depend on the specific model
(D) All of the above ( )

Q.42 An unbounded feasible region
(A) Arises from an incorrect formulation
(B) Means the objective function is unbounded
(C) Neither of the above
(D) Both A and B ( )

Q.43 The terms in the sequence 6, 2, −4, −6, −2, 4, ... can be found using which formula?
(A) $a_n = a_{n-2} - a_{n-1}$, $a_1 = 6$ and $a_2 = 2$
(B) $a_n = 6 + (n-1)4$
(C) $a_n = a_{n-1} - a_{n-2}$, $a_1 = 6$ and $a_2 = 2$
(D) There is no formula that works.
( )

Q.44 The value of the mean value theorem ,if $f((x) = 2x^2 + 3x + 4$ in [1,2] is
(A) 2 (B) 1 (C) 3/2 (D) 2/3 ( )

Q.45 The number of points at which the function is discontinuous is

(A) 2 (B) 1 (C) 3/2 (D) 2/3 ( )

Q.46 A function f defined on a measurable set E is said to be Lebsgue integrable if

(A) U= V (B) U = 1/V (C) U = -V (D) None of these ( )

Q.47 Let f and g be any two bounded measurable functions on a set E and c be a constant. Then we have

(A) (B)

(C) Both A and B (D) None of these ( )

Q.48 Let f_i be a countable collection of measurable function which statement is false

(A) inf f_i is not measurable (B) sup f_i is measurable
(C) lim inf f_i is measurable (D) lim sup f_i is measurable ( )

Q.49 In case of continous random variable probability at fixed point (say c) is always

(A) 2 (B) 1 (C) 0 (D) 3 ( )

Q.50 The variance is denoted by or

(A) (B) (C) (D) ( )

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