MATHEMATICS PG

1. If  is not a constant function satisfying the property  then  is

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

2. The largest interval lying in  in which the function

  is defined, is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

3. If  is a differentiable function such that  for  then

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) | does not exists  |

4. Area lying between the parabola  and its latus rectum is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

5. Area bounded by the curves    and *x* axis is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

6. Area bounded by the curve   and  is given by

|  |  |
| --- | --- |
| (A) | *e* |
| (B) |  |
| (C) | 1 |
| (D) | 2 |

7. Equations of the curve passing through (1, 1) and satisfying the differential equation   is given by

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

8. The differential equation of the family of curves  where *A* and *B* are arbitrary constants is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

9. Projection of the vector  on the vector  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

10. If     then the angle between *a* and *b* is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

11. The vector  is perpendicular to  then *a* is equal to

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

12. Let *a* and *b* be two unit vectors and *α* is the angle between them. If the vector  is a unit vector, then the angle

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

13. The work done by the force  in moving a particle from (3, 4, 5) to (1, 2, 3) is

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

14. The area of the triangle whose two sides are  and  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

15. The area of the parallelogram having diagonals  and  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) | 8 |
| (D) | 4 |

16.  is equal to

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

17. The volume of the parallelepiped whose sides are   and  is

|  |  |
| --- | --- |
| (A) |  |
| (B) | 7 |
| (C) |  |
| (D) | 2 |

18. 

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

19. The number of non-zero terms in the expansion of is

|  |  |
| --- | --- |
| (A) | 9 |
| (B) | 0 |
| (C) | 5 |
| (D) | 10 |

20. The number of terms in the expansion of  is

|  |  |
| --- | --- |
| (A) | 11 |
| (B) | 33 |
| (C) | 66 |
| (D) | 88 |

21. If the coefficient of *x*7 and *x*8 in  are equal then *n* is

|  |  |
| --- | --- |
| (A) | 56 |
| (B) | 55 |
| (C) | 45 |
| (D) | 15 |

22. In the expansion of , the sum of the coefficients of odd powers of *x* is

|  |  |
| --- | --- |
| (A) | 0 |
| (B) | 249 |
| (C) | 250 |
| (D) | 251 |

23. The sum of the coefficients in  is

|  |  |
| --- | --- |
| (A) | 210 |
| (B) | 310 |
| (C) | 1 |
| (D) | None of the above |

24. In the expansion of , the first three terms are  then *n* =

|  |  |
| --- | --- |
| (A) | 9 |
| (B) | 12 |
| (C) | 6 |
| (D) | 10 |

25. The Binomial expansion of  is valid only when

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

26.  is equal to

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) | None of the above |

27. The number of vectors of unit length perpendicular to the vector  and  is

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

28. The greatest integer less than or equal to  is

|  |  |
| --- | --- |
| (A) | 208 |
| (B) | 104 |
| (C) | 412 |
| (D) | None of the above |

29. The number  is divisible by

|  |  |
| --- | --- |
| (A) | 5 |
| (B) | 11 |
| (C) | 52 |
| (D) | 108 |

30. For every positive integer   is divisible by

|  |  |
| --- | --- |
| (A) | 7 |
| (B) | 2 |
| (C) | 343 |
| (D) | None of the above |

31. If  then

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

32.  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

33. The largest interval for which  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

34. The greatest value of *x* in order that  is

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

35. The number of ways, in which a student can choose 4 courses out of 9 courses, when 2 courses are compulsory, is

|  |  |
| --- | --- |
| (A) | 36 |
| (B) | 35 |
| (C) | 126 |
| (D) | 256 |

36. The number of different four digit numbers that can be formed with the digits 2, 3, 4, 5, 7 using each digit only once is

|  |  |
| --- | --- |
| (A) | 120 |
| (B) | 96 |
| (C) | 24 |
| (D) | 12 |

37. The number of diagonals that can be drawn by joining the vertices of an octagon is

|  |  |
| --- | --- |
| (A) | 28 |
| (B) | 48 |
| (C) | 20 |
| (D) | 10 |

38. The sum of the digits in the unit place of all the numbers formed with the help of 3, 4, 5, 6 taken all at a time is

|  |  |
| --- | --- |
| (A) | 432 |
| (B) | 108 |
| (C) | 36 |
| (D) | 18 |

39. The number of 4 digit numbers that can be formed by the digits 3, 4, 5, 6, 7, 8, 0, no digit is being repeated, is

|  |  |
| --- | --- |
| (A) | 720 |
| (B) | 840 |
| (C) | 280 |
| (D) | 120 |

40. The number of positive integers greater than 6000 and less than 7000 which are divisible by 5, using the digits 0, 1, 2, …, 9, no digit being repeated, is

|  |  |
| --- | --- |
| (A) | 56 |
| (B) | 112 |
| (C) | 28 |
| (D) | None of the above |

41. A polygon has 60 diagonals, the number of its sides is

|  |  |
| --- | --- |
| (A) | 10 |
| (B) | 11 |
| (C) | 12 |
| (D) | None of the above |

42. The number of parallelograms that can be formed from a set of four parallel lines intersecting another set of three parallel lines is

|  |  |
| --- | --- |
| (A) | 6 |
| (B) | 18 |
| (C) | 12 |
| (D) | 9 |

43. In how many ways can 5 red and 4 white balls be drawn from a bag containing 10 red and 8 white balls?

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) | None of the above |

44. Four dice are rolled, the number of possible outcomes in which at least one die shows 2, is

|  |  |
| --- | --- |
| (A) | 1296 |
| (B) | 625 |
| (C) | 671 |
| (D) | 751 |

45. The sum of proper divisors of 72 (1 and 72 are excluded) is equal to

|  |  |
| --- | --- |
| (A) | 195 |
| (B) | 122 |
| (C) | 194 |
| (D) | None of the above |

46. The average of first *n* natural numbers is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

47. The arithmetic mean of 9 observations is 100 and that of 6 is 80. Then the combined mean of all the 15 observations will be

|  |  |
| --- | --- |
| (A) | 100 |
| (B) | 80 |
| (C) | 90 |
| (D) | 92 |

48. If  and  are uniformly continuous, then …………… is uniform continuous.

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) | None of the above |

49. The set of all real number *R* with respect to usual topology is a

|  |  |
| --- | --- |
| (A) | disconnected set |
| (B) | connected set |
| (C) | compact set |
| (D) | closed set |

50. …………

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

51. The sum of the eigen values of the matrix  is

|  |  |
| --- | --- |
| (A) | 0 |
| (B) | 4 |
| (C) | 2 |
| (D) |  |

52. 

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

53. For two sets *A* and *B*, 

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

54. Consider the vector space  where *R* is the field of real numbers. Let *S* be the subspace of  spanned by  and let *T* is the subspace spanned by  Then  and  are respectively

|  |  |
| --- | --- |
| (A) | 1, 1 |
| (B) | 0, 1 |
| (C) | 0, 2 |
| (D) | 1, 2 |

55. is a basis for the vector space ……………

|  |  |
| --- | --- |
| (A) | *C* over *R* |
| (B) | *R* over *C* |
| (C) | *R ×* *R* over *C* |
| (D) | None of the above |

56. In  let  Then  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |   |
| (C) | *S* |
| (D) | Set of all polynomials of degree  |

57. The Characteristic polynomial of  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

58. The norm of the vector (1, 2, 3) in  with standard Inner product is …………..

|  |  |
| --- | --- |
| (A) | 6 |
| (B) | 14 |
| (C) |  |
| (D) | 1 |

59. If  has two equal roots, then there is a common root for

|  |  |
| --- | --- |
| (A) |  and  |
| (B) |  and  |
| (C) | and  |
| (D) | None of the above |

60. If *a*, *b* and *c* are the real numbers, then which of the following is not true?

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

61. For which value of *k* does the following pair of equation yields unique solution for *x* such that the solution is positive?

 

|  |  |
| --- | --- |
| (A) | 2 |
| (B) | 0 |
| (C) |  |
| (D) |  |

62. If the length of the sides of a triangle are 3, 5 and 7 then the largest angle of the triangle is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

63. If *y* is expressed in terms of a variable *x* as  then *y* is called

|  |  |
| --- | --- |
| (A) | explicit function  |
| (B) | implicit function  |
| (C) | linear function  |
| (D) | identity function |

64. *Z* is a group under

|  |  |
| --- | --- |
| (A) | Subtraction  |
| (B) | Division  |
| (C) | Multiplication |
| (D) | Addition |

65. If *f* is a bijective function, then 

|  |  |
| --- | --- |
| (A) | 0 |
| (B) | 1 |
| (C) | 2 |
| (D) | *x* |

66. Extraction of a cube root of a given number is

|  |  |
| --- | --- |
| (A) | binary operation |
| (B) | relation  |
| (C) | unary operation  |
| (D) | relation in some set |

67. Matrix *A* will not be transformed into an identity matrix if matrix is

|  |  |
| --- | --- |
| (A) | singular  |
| (B) | non-singular  |
| (C) | identified  |
| (D) | unidentified |

68. The system of linear equations  has a non-trivial solution, if *d* equals

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

69. The function has

|  |  |
| --- | --- |
| (A) | a maxima at *x* = 1 and a minima at *x* = 3 |
| (B) | a maxima at *x* = 3 and a minima at *x* = 1 |
| (C) | no maxima, but a minima at *x* = 1 |
| (D) | a maxima at *x* = 1, but no minima |

70. Let  be the identity matrix of odd order *n*, then

|  |  |
| --- | --- |
| (A) | *adj* |
| (B) | *adj* |
| (C) | *adj* |
| (D) |  |

71. The derivative of  at *x* = 0 is

|  |  |
| --- | --- |
| (A) | 1 |
| (B) |  |
| (C) | 0 |
| (D) | does not exist |

72. Limit of as *x* approaches  is

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

73. The value of integral 

|  |  |
| --- | --- |
| (A) | 0 |
| (B) | 0.25 |
| (C) |  |
| (D) |  |

74. Area bounded by the parabola  and the line  is equal to

|  |  |
| --- | --- |
| (A) | 6 |
| (B) | 18 |
| (C) |  |
| (D) | None of the above |

75. Directional derivative of  at the point (1, 1, 1) in the direction is

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

76. The convergence of which of the following method is sensitive to starting value?

|  |  |
| --- | --- |
| (A) | False position |
| (B) | Gauss seidal method  |
| (C) | Newton- Raphson method  |
| (D) | All of the above |

77. If  then  equals

|  |  |
| --- | --- |
| (A) | 0 |
| (B) | 1 |
| (C) | 2 |
| (D) |  |

78. Let *A* be the set of all non-singular matrices over real numbers and let \* be the matrix multiplication operator. Then

|  |  |
| --- | --- |
| (A) | *A* is closed under \* but < *A*, \* > is not a semi group |
| (B) | < *A*, \* > is a semi group but not a monoid  |
| (C) | < *A*, \* > is a monoid but not a group  |
| (D) | < *A*, \* > is a group but not an abelian group |

79. Which is not true about number zero?

|  |  |
| --- | --- |
| (A) | Even  |
| (B) | Positive  |
| (C) | Additive identity  |
| (D) | Additive inverse of zero |

80. Infeasibility means that the number of solutions to the linear programming models that satisfies all constraints is

|  |  |
| --- | --- |
| (A) | at least 1  |
| (B) | 0 |
| (C) | an infinite number  |
| (D) | at least 2 |

81. A constraint that does not affect the feasible region is a

|  |  |
| --- | --- |
| (A) | non-negativity constraint |
| (B) | redundant constraint |
| (C) | slack constraint |
| (D) | standard constraint |

82. The variables whose coefficient vectors are unit vectors are called

|  |  |
| --- | --- |
| (A) | basic variables |
| (B) | unit variables |
| (C) | non basic variables |
| (D) | None of the above |

83. If in an LPP the value of a variable can be made infinity large without violating the constraints, then the solution is

|  |  |
| --- | --- |
| (A) | infeasible solution  |
| (B) | alternative solution  |
| (C) | unbounded solution |
| (D) | None of the above |

84. A set ***A*** is said to be countable if there exists a function ***f* : *A* → *N*** such that

|  |  |
| --- | --- |
| (A) | ***f*** is bijective  |
| (B) | ***f*** is surjective  |
| (C) | ***f*** is identity map  |
| (D) | None of the above |

85. A convergent sequence has only …………… limit(s).

|  |  |
| --- | --- |
| (A) | one  |
| (B) | two |
| (C) | three |
| (D) | None of the above |

86. A sequence of real numbers is Cauchy if and only if

|  |  |
| --- | --- |
| (A) | it is bounded  |
| (B) | it is convergent  |
| (C) | it is positive term sequence  |
| (D) | it is convergent but not bounded |

87. A series is convergent if

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

88. Every Cauchy sequence has a

|  |  |
| --- | --- |
| (A) | convergent subsequence |
| (B) | increasing subsequence |
| (C) | decreasing subsequence |
| (D) | positive subsequence |

89. Laplace transform is a ……………

|  |  |
| --- | --- |
| (A) | linear transform |
| (B) | binomial transform |
| (C) | canonical transform  |
| (D) | None of the above |

90. A system of two equations that has no values to satisfy both equations is called

|  |  |
| --- | --- |
| (A) | consistent system |
| (B) | inconsistent system  |
| (C) | solution system  |
| (D) | constant system |

91. The graph of the function  is symmetrical about the line *x* = 2, then

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

92. Network models of projects have advantage in terms of

|  |  |
| --- | --- |
| (A) | Planning only |
| (B) | Scheduling only |
| (C) | Controlling only |
| (D) | All of the above |

93. The average marks of boys in a class is 52 and that of girls is 42. The average marks of boys and girls combined is 50. The percentage of boys in the class is

|  |  |
| --- | --- |
| (A) | 40% |
| (B) | 20% |
| (C) | 80% |
| (D) | 60% |

94. The order and degree of the differential equation  is

|  |  |
| --- | --- |
| (A) | (1, 2) |
| (B) | (2, 2) |
| (C) | (1, 1) |
| (D) | (2, 1) |

95. The solution of the differential equation  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

96. If the points with position vectors   and  are collinear, then *a* is equal to

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) | 20 |
| (D) | 40 |

97. The centre of the circle given by  and  is

|  |  |
| --- | --- |
| (A) | (0, 1, 2) |
| (B) | (1, 3, 4) |
| (C) |  |
| (D) |  |

98. If the projection of the vector  on is  and if  then the angle between  and  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

99. The line joining the points  and the line joining the points   intersect at

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

100. If is a unit vector, then  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

101. The figure formed by the four points    and is

|  |  |
| --- | --- |
| (A) | trapezium  |
| (B) | rectangle |
| (C) | parallelogram |
| (D) | None of the above |

102. The value of  is

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

103. Distance between two parallel planes  and  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

104. If the angle *θ* between the line  and the plane  is such that  then the value of *λ* is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

105. The plane  cuts the sphere  in a circle of radius

|  |  |
| --- | --- |
| (A) |  |
| (B) | 2 |
| (C) | 1 |
| (D) | 3 |

106. The equation of the plane which is parallel to  and and also at equidistant from the planes is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

107. A variable plane moves so that sum of the reciprocals of its intercepts with the coordinate axes is  Then, the plane passes through the point

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) | (2, 2, 2) |
| (D) | (0, 0, 0) |

108. The perimeter of the triangle with vertices at  and  is

|  |  |
| --- | --- |
| (A) | 3 |
| (B) | 2 |
| (C) |  |
| (D) |  |

109. The sequence  where  is

|  |  |
| --- | --- |
| (A) | bounded below but not from above |
| (B) | bounded above but not from below |
| (C) | unbounded both from below and above  |
| (D) | monotonic |

110.  is

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

111. If  then  equals

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

112. If then  is equal to

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

113. If  then  is equal to

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

114. If  and then  equals

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

115. Area bounded by the curve  and line  is , then *m* is equal to

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

116. The area of the region bounded by  and  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

117. The area between the curve  and the *x*-axis is equal to

|  |  |
| --- | --- |
| (A) | 1 sq unit |
| (B) |  sq unit |
| (C) |  sq unit |
| (D) | 2 sq unit |

118. *X* is a non-negative valued continuous random variable with distribution function  Define . Then *Y* has

|  |  |
| --- | --- |
| (A) | discrete uniform distribution  |
| (B) | uniform distribution on the interval  with  and both positive  |
| (C) | uniform distribution on  |
| (D) | None of the above |

119. The function for  is

|  |  |
| --- | --- |
| (A) | continuous and differentiable at   |
| (B) | continuous but not differentiable at   |
| (C) | discontinuous at  |
| (D) | discontinuous and differentiable at  |

120. Let  and  for all . Then 

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

121. If the point  is shifted by a distance  unit parallel to the line , then the coordinates of *P* in new position is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) | (5, 4) |

122. The *n*th term of the sequence  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

123. If *H* and *K* are subgroups of a group *G*, then *HK* is a subgroup of *G* if and only if

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

124. The vectors (1, 1, 0), (3, 1, 3) and (5, 3, 3) in  are

|  |  |
| --- | --- |
| (A) | linearly independent over  |
| (B) | linearly dependent over  |
| (C) | basis of  |
| (D) | orthonormal vectors  |

125. *X*  is a real valued random with  Then the random variable takes

|  |  |
| --- | --- |
| (A) | any one of the real numbers with probability one and remaining real numbers with probability zero |
| (B) | any purely complex number alone with probability 1  |
| (C) | the number zero alone with probability one |
| (D) | None of the above |

126. *X* is a random variable with expected value  Then its variance is

|  |  |
| --- | --- |
| (A) | necessarily zero  |
| (B) | strictly negative |
| (C) | not defined |
| (D) | None of the above |

127. Expectation  of a continuous non-negative valued random variable *X*, with distribution function  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) | None of the above |

128. *X* and *Y* are two dependent random variables. Then  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

129. *X* is a binomial random variable, that is *X* is  *Y* is a Poisson random variable, independent of *X*, having expected value *θ*, that is . Then  for non-negative integers *r* and *m*, is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) | None of the above |

130.  are *n* independent but non-identically distributed random variables. Then the characteristic function of their sum

|  |  |
| --- | --- |
| (A) | is not defined |
| (B) | exists but takes value infinity |
| (C) | is the product of their characteristic functions  |
| (D) | is the sum of their characteristic functions  |

131. The domain of convergence for  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) | {0} |

132. The matrix  is

|  |  |
| --- | --- |
| (A) | a Hermitian matrix  |
| (B) | a skew-Hermitian matrix |
| (C) | a skew-symmetric matrix |
| (D) | not in the class of matrices given (A) to (C) above |

133. If  then

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

134. The locus of the complex number satisfying  is

|  |  |
| --- | --- |
| (A) | straight line |
| (B) | circle |
| (C) | parabola |
| (D) | hyperbola |

135. Let  be the multiplicative group. Then the order of  is

|  |  |
| --- | --- |
| (A) | one |
| (B) | two |
| (C) | three |
| (D) | four |

136. The set of all even integers is

|  |  |
| --- | --- |
| (A) | a field  |
| (B) | a skew field |
| (C) | a commutative ring |
| (D) | None of the above |

137. The number of arbitrary constants in a differential equation of order *m* and degree *n* is *p*. Then

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

138. The solution of  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

139. The equation  is

|  |  |
| --- | --- |
| (A) | a partial differential equation  |
| (B) | an exact differential equation |
| (C) | not an exact differential equation |
| (D) | an equation of straight line |

140. The mean and variance of Poisson distribution are same. This statement is

|  |  |
| --- | --- |
| (A) | always true |
| (B) | never true |
| (C) | sometimes true |
| (D) | irrelevant to Poisson distribution  |

141. The set of all real numbers *x* such that  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

142. Let  be a function defined by  for  Then = identity if and only if

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

143. Which of the following is not a metric on 

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) | None of the above |

144. Three identical dice are rolled. The probability that the same number will appear on each of them is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

145. Which of the following sets is uncountable?

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) | {*x* : *x* is an irrational and } |
| (D) |  |

146. In the set of all circles in planes, the relations  and  have exactly two common points is

|  |  |
| --- | --- |
| (A) | reflexive  |
| (B) | symmetric |
| (C) | transitive |
| (D) | antisymmetric |

147. The locus of the point *z* satisfying the condition  where,  is

|  |  |
| --- | --- |
| (A) | a circle |
| (B) | interior of a circle |
| (C) | a straight line |
| (D) | a point |

148. If  then the value of  is

|  |  |
| --- | --- |
| (A) |  |
| (B) |  |
| (C) |  |
| (D) |  |

149. Let *E* = [0, 1) and let  denote the interior of *E* and  denote the closure of *E*. Then

|  |  |
| --- | --- |
| (A) | and  |
| (B) |  |
| (C) |  and |
| (D) |  and |

150. If *C* is the unit circle  then 

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

