**Text

Description automatically generated**

**FT/MAQP/1221/A 23-SEP-2021**

**FIRST TERM EXAMINATION (2021-2022)**

|  |  |
| --- | --- |
| **Subject : MATHEMATICS**  **Grade : XII** | **Max: Marks: 40****Time: 90 minutes** |
| ***General Instructions:***   1. ***All questions are compulsory.*** 2. ***The question paper consists of 36 questions divided into 3 sections A, B and C*** 3. ***Section A comprises of 20 MCQs, attempt any 16 out of 20.*** 4. ***Section B comprises of 20 MCQs, attempt any 16 out of 20.*** 5. ***Section C comprises of 10 MCQs, attempt any 8 out of 10.*** 6. ***There is is no negative marking.*** 7. ***All questions carry equal marks.*** | |

**SECTION-A**

|  |  |
| --- | --- |
|  |  |
| 1. | Which of the following function from Z to Z are bijection?   1. f(x) = x3  b) f(x) = x+2 c) f(x) = 2x+1 d) f(x) = x2+1 |
| 2. | The matrix P=  a)Unit matrix b) Diagonal matrix c) Scalar matrix d) None of these |
| 3. | If f(x)=. Then  a) *b)0 c) d)1* |
| 4. | Let A={1,2,3].Then number of relations containing (1,2) and (1,3) which are reflexive and symmetric but not transitive is   1. 1 b) 2 c) 3 d)4 |
| 5. | If A is a skew-symmetric matrix, then A2 is   1. skew-symmetric matrix b) symmetric matrix c) unit matrix d) Null matrix |
| 6. | The domain of the function defined by f(x) = is :  a)[1,2] b) [-1,1] c) [0 , 1] d) None |
| 7. | The optimal value of the objective function is attained at the point given by :   1. Corner point of the feasible region b) Points in the feasible region   c) None d) Origin |
| 8. | The principal value of )   1. b) c) - d) |
| 9. | The value of *p*, such that the matrixis singular   1. 2 b) -8 c) 4 d) 1 |
| 10. | The value of ‘k’ for which the following function is continuous at x = 0.    f(x) =   1. 1 b) 0 c) no value d) |
| 11. | If A and B are invertible matrices of order 3, and . then   1. -3 b) 1/3 c) 6 d) 1 |
| 12 | If ,then x is   1. 4 b) 6 c) 1 d) 2 |
| 13. | If the points (, 7) (1, - 5), and (-4, 5) are collinear, then the value of  a)-5 b) -2 c) 5 d) 2 |
| 14. | The derivative of sin(sinx2) at x=   1. 1 b) 0 c)1/2 d) 3/2 |
| 15. | The value of a for which the function  f(x)={   1. 13/3 b) 1 c) 0 d) -1 |
| 16. | If sinxy + cosxy =1 and tanxy is   1. -y/x b) y/x c) x/y d) -x/y |
| 17. | If y= log ,then the value of at x= is given by   1. 1 b)0 c)1/2 d) |
| 18. | The curves y=a and y=bcut orthogonally ,if   1. a=b b) a = -b c) ab=1 d) ab=-1 |
| 19. | The derivative of y = is   1. 1 b) x/2 c) x/3 d) 0 |
| 20. | Set A has 4 elements, and the set B has 5 elements. Then, the number of injective mappings that can be defined from A to B.  a)120 b) 24 c) 4 d) 5 |
|  | SECTION-B |
| 21. | The principal value of   1. -  b)  c) d) |
| 22. | If A is a square matrix of order 3 and =64, then  a)32 b) 16 c) 4 d) 8 |
| 23. | The minimum value of (ax + by), where  a) B) c) d) |
| 24. | If tangent to the curve at the point (h, k) is the parallel to the line x-y = 4, then the value of ‘k’   1. 3/2 b) 2/3 c) -2/3 d) - 3/2 |
| 25. | If A= ,then the value of ‘k’ so that   1. 2 b) 3 c) 1 d) 4 |
| 26. | If y=a sinmx + b cosmx, then is equal to  a) b) c) my d) -my |
| 27. | If the matrix is symmetric, then the value of x-y-z   1. 4 b) -3 c) 1 d) 7 |
| 28. | If A be a 3x3 matrix such that A. adj A =3 I, then the value of   1. 27 b) 9 c) 3 d) 1 |
| 29. | The differential coefficient of sec(   1. b) c)d) x |
| 30. | If A2-A +I =0, then the inverse of A is   1. A b)A +I c) I-A d) A-I |
| 31. | The value of ) is   1. b) c) d) - |
| 32. | In an LPP, if the objective function Z=ax +by has the maximum value on two corner points of the feasible region, then the number of points at which Zmax occurs is   1. 0 b)2 c)finite d) infinite. |
| 33. | If + 3 =0,then x =  a)3 b)0 c) -1 d) 1 |
| 34. | If , then the value of *x*.   1. 13 b)3 c)10 d) 1 |
| 35. | The relation R on the set of all real numbers  .is  a) an equivalence relation. b)not reflexive, not symmetric and not transitive  c)reflexive but not symmetric and transitive d) reflexive, symmetric but not transitive |
| 36. | The values of x, for which f(x)=is an increasing function  a)( b) c) d) |
| 37 | Differentiation of t is  a)x/2 b)1/2 c)x d)1 |
| 38 | It is given at x=1, the function f(x)=+ ax +9 attains its maximum value in the interval ,then the value of a is   1. 12 b)120 c)124 d) 31 |
| 39. | If the derivative of takes the value 1 at x=0, then b =   1. 1+a2 b) 2 +a c) a d) 1 |
| 40. | A = B = then A-1 is   1. 8B b)6B c) B/8 d) B/6 |
|  | SECTION-C |
| 41 | Let Z=3x-4y be the objective function. Find the maximum and minimum values of Z   1. 12,-32 b) 18,0 c) 20,-3 d) 12,-12 |
| 42. | The slope of the tangent to the curve at the point (2, -1)   1. -6/7 b)5 c)-6 d) 6/7 |
| 43 | If P is the adjoint of 3 × 3 matrix A and |A| = 4, then find α   1. 11 b) 10 c) 12 d) 16 |
| 44 | If + = a ( x - y) ,then is  a) b) c) 1 d) x/y |
| 45. | If x= a (t +sint), y=a(1-cost) , then   1. 0 b) 1 c) 2 d)1/2 |
|  | CASE STUDY: Mr. Vinay is the owner of apartment complex with 50 units. When he set rent at Dh 8000/month, all apartments are rented. If he increases rent by Dh 250/month, one fewer apartment is rented. The maintenance cost for each occupied unit is Dh 500/month. Based on the above information, answer the following : |
| 46. | If P is the rent price per apartment and N is the number of rented apartment, then profit is given by  (a) NP (b) (N – 500)P (c) N(P – 500) (d) none of these |
| 47. | If x represent the number of apartments which are not rented, then the profit expressed as a function of x is   1. (50 – x) (30 + x) (b) (50 + x) (30 – x)   (c) 250(50 – x) (30 + x) (d) 250(50 + x) (30 – x) |
| 48. | If P =Dh 8500, then N is  (a) 50 (b) 48 (c) 49 (d) 47 |
| 49. | If P = 8250, then the profit is  (a) Dh 379750 (b) Dh 4,00,000 (c) Dh 4,05,000 (d) Dh 4,50,000 |
| 50 | The rent that maximizes the total amount of profit  (a) Dh 10500 (b) Dh 5000 (c) Dh 14800 (d) Dh 14500 |

**\*\*\***