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| Set 1 | | | |
| **PRE BOARD EXAMINATION TERM 1 -2021-SET 1 AK** | | | |
| **Subject: Mathematics**  **Grade: 12** | Max. Marks: 40Time: 90 minutes | | |
| **Name:** | | **Section:** | **Roll No:** |
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| |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **SECTION-A** | | | | | | | | | | 25 M | | 1. |  | | | | | | | | | | |  | a. | | f is one- one onto | | | b | | | f is many one onto | | |  | c. | | f is one -one but not onto | | | d. | | | f is neither one – one nor onto | | | 2. | Objective function of an LPP is | | | | | | | | | | |  | a. | | A constraint | | | b | | | A function to be optimized | | |  | c. | | A relation between the variables | | | d. | | | None of these | | | 3. | Which of the following is the principal value branch of cos -1 x | | | | | | | | | | |  | a. | |  | | | b. | | |  | | |  | c. | |  | | | d. | | |  | | | 4. |  | | | | | | | | | | |  | a. | | x =3, y =1 | | | b. | | | x = 2 , y = 3 | | |  | c. | | x = 2 , y = 4 | | | d. | | | x = 3 , y = 3 | | | 5. | Let R be the relation defined on the set of N natural numbers by the rule xRy iff x + 2y = 8 , then  the domain of R is | | | | | | | | | | |  | a. | | {2,4,8} | | | b. | | | {2,4,6} | | |  | c. | | { 2,4,6,8} | | | d. | | | { 1,2,3,4} | | | 6. |  | | | | | | | | | | |  | a. | | 1 | | | b. | | | 4 | | |  | c. | | 5 | | | d. | | | 3 | | | 7. | Which of the following is true for the function f ( x) = 9x – 5 | | | | | | | | | | |  | a. | | f(x) is strictly increasing on R | | | b. | | | f(x) is strictly decreasing on R | | |  | c. | | Both( a )and (b) are false | | | d. | | | f ( x ) is decreasing on R | | | 8. | If A = and B = , then | | | | | | | | | | |  | a. | |  | | | b. | | |  | | |  | c. | |  | | | d. | | | None of these | | | 9 |  | | | | | | | | | | |  | a. | | CA | | | b. | | | BA | | |  | c. | | AB | | | d. | | | CB | | | 10. |  | | | | | | | | | | |  | a. | | 3 | | | b. | | | 0 | | |  | c. | | -1 | | | d. | | | 1 | | | 11. | is continuous for | | | | | | | | | | |  | a. | | x | | | b. | | | x | | |  | c. | | Only x > 0 | | | d. | | | No value of x | | | 12. |  | | | | | | | | | | |  | a. | | -c( a2 – b 2 ) | | | b. | | | c( b2 – a 2 ) | | |  | c. | | c( b2 + a 2 ) | | | d. | | | c( a2 – b 2 ) | | a. | -c( a2 – b 2 ) | | 13. | , | | | | | | | | | | |  | a. | | -2 | | | b. | | | 0 | | |  | c. | | -1 | | | d. | | | 2 | | | 14. |  | | | | | | | | | | |  | a. | | Neither injective nor surjective | | | b. | | | Injective | | |  | c. | | Surjective | | | d. | | | Bijective | | | 15. |  | | | | | | | | | | |  | a. | |  | | | b. | | |  | | |  | c. | |  | | | d. | | |  | | | 16 | The corner points of the feasible region of a LPP are (0,0), ( 0, 8) ,( 2, 7) , ( 5,4) and ( 6, 0 )  The maximum profit Z = 3x + 2y occurs at the point | | | | | | | | | | |  | a. | | (0,8) | | | b. | | | (2, 7) | | |  | c. | | (5, 4) | | | d. | | | ( 6, 0 ) | | | 17 |  | | | | | | | | | | |  | a. | |  | | | b. | | |  | | |  | c. | |  | | | d. | | | None of these | | | 18 | The least value of the function f (x) = ax + ( a >0, b>0 , x>0 ) | | | | | | | | | |  | |  | a. | |  | | | b. | | |  | | |  | c. | |  | | | d. | | |  | | | 19 | The absolute maximum value of a function f given by | | | | | | | | | | |  | a. | | 18 | | | b. | | | 16 | | |  | c. | | 14 | | | d. | | | 12 | | | 20 | The tangent to the curve at the point ( 0,1 ) meets x- axis at | | | | | | | | | | |  | a. | | (0,1) | | | b. | | | ( - 1/ 2 , 0) | | |  | c. | | (2, 0) | | | d. | | | ( 0,2 ) | | |  | ***Section B***  ***In this section, attempt any 16 questions out of the questions 21 – 40.***  ***Each Question is of 1 mark weightage*** | | | | | | | | | | | 21 | Let N be the set of natural numbers and the function be defined by f (x) = 2x + 3 | | | | | | | | | | |  | a. | | Surjective | | | b. | | | Injective | | |  | c. | | Bijective | | | d. | | | None of these | | | 22 | If x is real , then the minimum value of | | | | | | | | | | |  | a. | | -1 | | | b. | | | 0 | | |  | c. | | 1 | | | d. | | | 2 | | | 23 |  | | | | | | | | | | |  | a. | | 0 | | | b. | | | 1 | | |  | c. | | 2 | | | d. | | | 3 | | | 24 |  | | | | | | | | | | |  | a. | | 1 | | | b. | | | 2 | | |  | c. | | 3 | | | d. | | | 4 | | | 25 | Which of the following is correct for the function f ( x) = | | | | | | | | | | |  | a. | | It has local maximum at x= 0 | | | b. | | | It has local minimum at x = 0 | | |  | c. | | It is neither maximum nor minimum at x = 0 | | | d. | | | It has maximum value as 1 | | | 26 | The angle between the curve y2 = x and x 2 =y at ( 1,1) is | | | | | | | | | | |  | a. | | |  | b. | | |  | | | |  | c. | | |  | d. | | |  | | | | 27 | | The equation of normal to the curve 3x2 – y 2 = 8 which is parallel to the line x + 3y = 8 , is | | | | | | | | | |  | a. | | | 3x-y = 8 | b. | | | 3x+y + 8 =0 | | | |  | c. | | |  | d. | | | x + 3y = 0 | | | | 28 | It is given that at x = 1 the function f(x) = x4 – 62 x2 + ax + 9 attains its maximum value , on the  interval [0, 2]..Find the value of a | | | | | | | | | | |  | a. | | | 20 | b. | | | -120 | | | |  | c. | | | 120 | d | | | 52 | | | | 29 | The normal to the curve x2 = 4 y passing (1,2) is | | | | | | | | | | |  | a. | | | x +y = 3 | b. | | | x-y =3 | | | |  | c. | | | x+y =1 | d. | | | x-y = 1 | | | | 30 | The greatest integer function f : is given by f ( x) = [x] where [x] denotes the greatest  integer less than or equal to x | | | | | | | | | | |  | a. | | | One-one | b. | | | Onto | | | |  | c. | | | Both one -one and onto | d. | | | Neither one-one nor onto | | | | 31 |  | | | | | | | | | | |  | a. | | | 1/2 | b. | | | 1/3 | | | |  | c. | | | 1/4 | d | | | 1 | | | | 32 | If  is continues at x = then | | | | | | | | | | |  | a. | | | m=1, n=0 | b. | | | m = | | | |  | c. | | |  | d. | | |  | | | | 33 |  | | | | | | | | | | |  | a. | | | a27 | b. | | | a9 | | | |  | c. | | | a6 | d. | | | a2 | | | | 34 |  | | | | | | | | | | |  | a. | | | 1/2 | b. | | | 1 | | | |  | c. | | | 2 | d. | | | None of these | | | | 35 |  | | | | | | | | | | |  | a. | | |  | b. | | | 3x2 | | | |  | c. | | |  | d | | |  | | | | 36 |  | | | | | | | | | | |  | a. | | |  | b. | | |  | | | |  | c. | | | 0 | d. | | |  | | | | 37 | If A and B are two matrices such that AB = B and BA =A , then A2+ B2 = | | | | | | | | | | |  | a. | | | 2BA | b. | | | 2AB | | | |  | c. | | | A+B | d. | | | AB | | | | 38 | If A is a square matrix , then which of the following matrices is not symmetric | | | | | | | | | | |  | a. | | | A + A’ | b. | | | AA’ | | | |  | c. | | |  | d. | | |  | | | | 39 |  | | | | | | | | | | |  | a. | | |  | b. | | |  | | | |  | c. | | |  | d. | | | None of these | | | | 40 |  | | | | | | | | | | |  | a. | | |  | b. | | |  | | | |  | c. | | |  | d. | | |  | | | |  | ***Section C***  ***In this section, attempt any 8 questions out of the questions.***  ***Each Question is of 1 mark weightage.***  ***Questions 46- 50 are based on case study*** | | | | | | | | | | | 41 |  | | | | | | | | | | |  | a. | | | x = 2 | b. | | | x = 4 | | | |  | c. | | | x = 7 | d. | | | None of these | | | | 42 |  | | | | | | | | | | |  | a. | | | Discontinuous at only one point | b. | | | Discontinuous at exactly two points | | | |  | c. | | | Discontinuous at exactly three points | d. | | | None of these | | | | 43 |  | | | | | | | | | | |  | a. | | |  | b. | | |  | | | |  | c. | | |  | d. | | |  | | | | 44 |  | | | | | | The feasible region for an LPP is shown in the figure. Then the maximum value of  Z = 0.7x + y | | | | |  | a. | | | 45 | b. | | | 40 | | | |  | c. | | | 50 | d. | | | 41 | | | | 45 | Which of the following is an equivalence relation | | | | | | | | | | |  | a. | | | R = { (a,b); 2 divides a-b, a, b belongs to Z} | b. | | |  | | | |  | c. | | | R = { (x,y ) : y = x+5 and x <4, x, y belongs to N } | d. | | | Where R is defined on the set {1,2,3,…14} | | | |  | **Case Study** | | | | | | | | | | |  | Ram is stunt driver. He is showing stunt by driving in a globe of metallic sphere .One day he  planned to install a metallic conical shape inside the metallic sphere .He was thinking about a  right circular cone of maximum volume that can be inscribed in a sphere of radius r. Based on  the above information answer the following questions | | | | | | | | | | | 46 | What is the volume of the cone V | | | | | | | | | | |  | a. | | |  | b. | | |  | | | |  | c. | | |  | d. | | |  | | | | 47 |  | | | | | | | | | | |  | a. | | |  | b. | | |  | | | |  | c. | | |  | d. | | |  | | | | 48 | What is the value of h for which the volume is maximum | | | | | | | | | | |  | a. | | |  | b. | | |  | | | |  | c. | | |  | d. | | | None of these | | | | 49 |  | | | | | | | | | | |  | a. | | |  | b. | | |  | | | |  | c. | | |  | d. | | |  | | | | 50 | What is the value of OD | | | | | | | | | | |  | a. | | | r- h | b. | | | h-r | | | |  | c. | | | r – h / 2 | d. | | | h- r / 2 | | | | | | |