**XAT 2006 Paper**

Given f(x) =  \cfrac{X}{X^2 - 1} then f(x) is:

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|  | increasing at x > 1 |
|  | decreasing at x < – 1 |
|  | symmetric about y – axis |
|  | None of thes |

ABCD is a square with side equal to 1. P is the mid point of side AB. A point Q is taken on the side BC such that in the triangle  \Delta DPQ the angle PDQ is  45^\circ , The area of the triangle PBQ is given by

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|  | \cfrac{1}{4} |
|  | \cfrac{1}{8} |
|  | \cfrac{1}{6} |
|  | \cfrac{1}{12} |

If f(x) =  X^4 - 6X^2; at which of the following values of x; is f(x) increasing:-

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|  |
|  | at x = – 6 |
|  | at x = 1 |
|  | at x = – 1 |
|  | None of these |

**Directions for next two questions** : There are seven dishes, Rohu, Kingfish, Pomphret Indian, Behet, “L”, Hilsa. These dishes are served in a particular order only, as per the following rules:-  
  
I: Kingfish will be served at  5^{th} or at  6^{th} and H will be served at 2nd position.  
II: Exactly one dish will be served between Pomphret  
III: L was served sometime before Pomphret  
IV: Rohu was served sometime before Kingfish.  
  
Which of the following is the correct order in which the seven dishes were served?

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|  | Behet, Hilsa, Rohu, Pomphret, Kingfish, Indian, L |
|  | L, Hilsa, Pomphret, Rohu, Indian, Behet, Kingfish |
|  | Hilsa, Behet, Lohu, Pomphret, Indian, Kingfish, L |
|  | Rohu, Hilsa, Indian, L, Pomphret, Kingfish, Behet |

Kingfish is served at  5^{th} position then which of the following is correct:-

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|  |
|  | Indian can be served before Kingfish |
|  | Rohu, Pomphret one served consecutively |
|  | Behet must be served just after the Kingfish |
|  | Behet must be served in the end only |

**Directions for next two questions** : There were seven persons A, B, C, D, E, F & G which were involved in a prize - winning competition of, in all, 14 lakhs rupees. The highest money a person got was Rs. 3.5 lakhs. No two persons got the same amount. E got 2 lakhs. B got more money than A. Everybody got some non-zero amount. For every competitor the difference with the next higher competitor was same as the difference with the next lower competitor. The difference in the amount of A & B was least. The difference in the amount of F and D was not least. E has as many competitors who won more money than him as who won lesser amounts of money than him.  
  
Which of the following is a correct ascending order of amount distribution:-

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|  |
|  | ABCDEFG |
|  | ABCEDFG |
|  | CABEDGF |
|  | CGFEDBA |

Given that A and C have the minimal difference then which of the following is correct?

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|  |
|  | A has won Rs. 3.5 lakhs |
|  | C has won Rs. 3.5 lakhs |
|  | G has won Rs. 3.5 lakhs |
|  | F has won Rs. 3.5 lakhs |

f  a^2 + b^2 = c^2 then the minimum value of  \bigg(\cfrac{c}{a} + \cfrac{c}{b} \bigg)^2 is:  
  
(a, b, c are any real numbers)

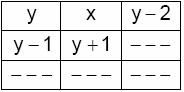
|  |
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|  |
|  | 0 |
|  | 16 |
|  | 4 |
|  | None |

A function f(x, y) is defined for non-negative integers  
I. f(0,0) = 0  
II. f(2x, 2y) = f(2x + 1, 2y + 1) = f(x, y)  
III. f(2x + 1, 2y) = f(2x, 2y + 1) = f(x, y) + 1  
  
What is the value of f(11, 5)

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|  |
|  | 1 |
|  | 2 |
|  | 3 |
|  | 4 |

If f(a, b) = 3; the minimum value of a + b is:

|  |
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|  |
|  | 2 |
|  | 5 |
|  | 4 |
|  | 7 |

**Directions for next two questions** : If the sum of rows, sum of columns and sum of the diagonals are equal in the following table, then:  
  
  
  
If x = 10; y = ??

|  |
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|  |
|  | 5 |
|  | 10 |
|  | 6 |
|  | 15 |

If the sum of any of the rows, column or diagonals is 21, then x is

|  |
| --- |
|  |
|  | 5 |
|  | 11 |
|  | Can’t be determined |
|  | None |

**Directions for next four questions** : Each question is followed by two statements I and II.   
  
Is (x – y)2 a factor of f(x, y) ?  
I. (x – y) is a factor of f(x, y)  
II: f(x, y) is symmetric i.e. f(x, y) = f(y, x)

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|  | if the question can be answered by any one of the statements alone, but cannot be answered by using the other statement alone. |
|  | if the question can be answered by using either statement alone. |
|  | if the question can be answered by using both the statements together, but cannot be answered by using either statement alone. |
|  | if the question cannot be answered even by using both statements together. |

A, B, C, D, E, F & G are seven persons such that weight of F > G; Weight of A, B, C > F. Weight of D > Weight of E. Who is the lightest in weight ?  
I: F > E  
II: E > F

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|  |
|  | if the question can be answered by any one of the statements alone, but cannot be answered by using the other statement alone. |
|  | if the question can be answered by using either statement alone. |
|  | if the question can be answered by using both the statements together, but cannot be answered by using either statement alone. |
|  | if the question cannot be answered even by using both statements together. |

ABCD is a parallelogram. E & F are the mid-points of BC & CD respectively. AC & BD meet at S. AE & AF cut BD at P & Q respectively. Find the value of PQ.  
I: BS = 6 cm  
II: AD = 4 cm

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|  | if the question can be answered by any one of the statements alone, but cannot be answered by using the other statement alone. |
|  | if the question can be answered by using either statement alone. |
|  | if the question can be answered by using both the statements together, but cannot be answered by using either statement alone. |
|  | if the question cannot be answered even by using both statements together. |

For what value of l; W shall be maximum ?  
W =  l^2 (30 - l)(2l + 1)^{-2} 

|  |
| --- |
|  |
|  | 3 |
|  | 4 |
|  | 5 |
|  | 6 |

y =  e^{0.08t} where, t is in years. In how many years, the value of y will become 4 times it’s initial value (given, ln 2 = 0.691)

|  |
| --- |
|  |
|  | 25 years |
|  | 20 years |
|  | 15 years |
|  | 17 years |

If  \ {}^aC_2 = b; what is the value of  \ {}^bC_2 ?

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|  |
|  | 3. {}^{a+1}C_2 |
|  | 3. {}^{a+1}C_4 |
|  | 3. {}^{b+1}C_4 |
|  | 3. {}^{b+1}C_2 |

x and y are two products of a company. “x” is the number of units produced of higher quality product, per day. Whereas “y” is the number of units of lower quality product produced per day. The profit in selling a higher quality product is double than that in selling the lower quality product. For any given day y =  \cfrac{(98 - X)}{X} . Find the no. of units of higher quality product so as to give the maximum profit

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|  |
|  | 7 units |
|  | 13 units |
|  | 10 units |
|  | 12 units |

Given  x_1 = 5;  x_225 &  x_{n+y} = gcd  (x_{n+1,} x_n) + x_n; gcd = greater common divisor. Then the least common multiple of  x_{19} and x_{20} is :-

|  |
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|  |
|  | 2560 |
|  | 1280 |
|  | 5120 |
|  | None of these |

How many natural numbers are there for which the remainder is 41 when the dividend is 1997 ?

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|  |
|  | 5 |
|  | 12 |
|  | 10 |
|  | 6 |

If f(x) is a function and g(x) is one other function such that;  
g(x) = |f(x)|  
then g(x) is:-

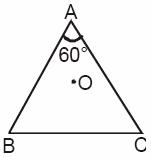
|  |
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|  |
|  | one – one if f(x) is one – one |
|  | onto, if f(x) is onto |
|  | continuous function |
|  | continuous & differentiable function |

x and y are non – negative real numbers such that,  x^2 + xy +  y^2 = 1, what is the minimum value of  x^3y + xy^3 ?

|  |
| --- |
|  |
|  | 16 |
|  | 0 |
|  | 4 |
|  | 2 |

There are 9 elements f, g, h, i, j, k, l, m & n which need to be divided among 3 sets, A, B & C. Atleast one element in A & C and at least 2 elements in B. The sets could have the constituents:  
(I) i  \in B  
(II) if g \in A than k \in C  
(III) f & g are not in the same set  
(IV) #(A) = #(C) ; # (n)  \equiv no. of elements

|  |
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|  |
|  | A {i, j, f}; B {l, m, n}; C {g, k, h} |
|  | A {k, j}; B {g, i, m, l, n}; C { f, h} |
|  | A {f, g, h}; B {i, j, k, l, m}; C {n} |
|  | All are possible |

  
  
ABC is a triangle. “O” is the incentre and  \angle A = 60^\circ, AD is perpendicular on BO & AE is perpendicular on CO. What is the value of  \cfrac{AD}{BO} + \cfrac{AE}{CO} 

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|  |
|  | \sqrt{3} |
|  | \cfrac{1}{\sqrt{3}} |
|  | \cfrac{\sqrt{3}}{2} |
|  | 2 \sqrt{3} |

If a, b, c are distinct real numbers from 1 to 9. The minimum value of  \cfrac{abc}{a + b + c} is :

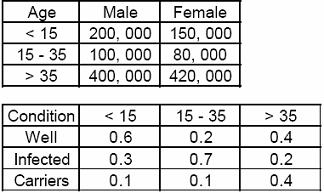
|  |
| --- |
|  |
|  | 9 |
|  | 10 |
|  | 1 |
|  | 11 |

The length of a swimming pool is 10 m & it’s width is 6 m. Water is 0.8 m deep at the shallow end & it is 2.5 m at the deep end. It is to be filled by a water source supplying water at a rate 90 l/min. The total time taken to file the pool is:

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|  |
|  | 18.6 hrs |
|  | 18 hrs |
|  | 18.33 hrs |
|  | 19 hrs |

y =  \bigg(X - \cfrac{1}{X} \bigg)  \cfrac{1}{2} \ +  \bigg(\cfrac{1}{X} - X \bigg)  \cfrac{1}{2} ; then x = ? (x, y are real numbers)

|  |
| --- |
|  |
|  | 1 |
|  | 2 |
|  | both a. & b. |
|  | does not exist |

There are 3 categories of people in a city: **Well, Infected & Carriers** in 3 different age groups: below 15 yrs; 15 yrs to 35 yrs; above 35 yrs of age. Following tables are given. What is the no. of females “carriers”. Given that:-  
  
  
  
(i) Amongst people below 15 yrs. of age, there are no. male carriers  
(ii) Above the age of 35, only females carry the disease.  
(iii) Between the age 15 to 35; female carries is twice that of male carrier.

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|  |
|  | 12,900 |
|  | 13,500 |
|  | 3,600 |
|  | None of these |

**Directions for next two questions** : There are 20 items of which 5 are defective. Two item are selected at random, A is an event of selecting first defective item, B is an event of selecting second defective.  
  
Which of the following is correct?

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|  |
|  | A & B are independent events |
|  | A & B are dependent events |
|  | A & B are mutually exclusive and exhaustive events |
|  | A & B are mutually exclusive and equally likely event |

Which of the following is correct ?

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|  | P(A). > P(B). |
|  | P(A). < P(B). |
|  | P(A). = P(B). |
|  | P \Bigg(\cfrac{A}{B} \Bigg)  = P \Bigg(\cfrac{A}{B} \Bigg) |

P(x) is a polynomial of degree 998. (K) =  \cfrac{1}{K} for K is integral varying from 1 to 999. Find the value of P (1001).

|  |
| --- |
|  |
|  | 1 |
|  | 1001 |
|  | \cfrac{1}{1001} |
|  | \cfrac{1}{(1001!)} |