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21UMB1          UNIT  TEST - I  EXAM  NO - 1

TIME : 1.30          MATHEMATICS          MARKS : 50

I     Choose  the  correct  answer :                    10 x 1 = 10

1.    If  A = { a, b, p }    B = { 2, 3 }  and  C = { p, q, r, s }  then  n [ ( A ∪ C) x B ] is
      _____ a)  8      b)  20        c)  12        d)  16

2.    If  the  range  of  the  relation  R = { ( x , $x^2$) / x  is  a  prime  number  < 13 }  is _____
      a)  { 2, 3, 5, 7 }                        b)  { 2, 3, 5, 7, 11}
      c)  { 4, 9, 25, 49, 121 }            d)  { 1, 4, 9,  25, 49, 121 }

3.    If  n (A x B) =6 and  A = { 1, 3 }  then  n ( B ) is ____ a) 1    b) 2    c) 3   d) 6

4.    If  the  ordered  pairs  ( a+ 2, 4 )  and  ( 5, 2a + b )  are  equal  then  ( a, b ) is __
      a)  ( 2, -2 )      b)  ( 5, 1 )        c)  ( 2 ,3 )        d)  ( 3, -2 )

5.    If  A = { 1, 2 },    B = { 1, 2, 3, 4 },  C = { 5, 6 }  and  D = { 5, 6, 7,  8 }then  state
      which  of  the  following? _____      a)  ( A x C ) ⊂ ( B x D )        b)  ( B x D )
      ⊂ ( A x C )   c)  ( A x B ) ⊂ ( A x D )     d)  ( D x A ) ⊂ ( B x A )

6.    Let  n ( A ) = m  and  n ( B ) = n  then  the  total  number  of  non – empty  relations
      that  can  be  defined  from  A to B  is _____
      a)  $m^n$          b)  $n^m$          c)  $2^{mn} – 1$        d)  $2^{mn}$

7.    If  there  are 1024 relations  from  a set  A = { 1, 2, 3, 4, 5 }  to  a  set  B, then  the
      number  of  elements  in  B is _____ a) 3      b) 2      c) 4        d) 8

8.    If  n (A x B)=20 and  n (A)=5 then  n (B) is ___a)  4     b)  5      c)  9    d) 20

9.    A  relation  which  contains  no  element  is called  a _____
      a)  subset          b)  ordered  pairs      c)  null  relation        d)  none  of  these

10.   If  n( A ) = p,  n ( B ) = q  then  the  total  number  of  relations  that  exist  from  A  to  B
      is _____        a) $2^{pq}$        b) $2^{pq} – 1$        c) $p^q$        d)  $q^p$

II     Answer  the  following :                    6 x 2 = 12

11.   If  B x A = { ( -2, 3), ( -2, 4), ( 0,  3), ( 0,4), (3,3), (3, 4) }  find  A  and  B.

12.   If  A = { 1, 3, 5 }  and  B = { 2, 3 }  then  find  A x B  and   B x A.

13.   Define  : Relation

14.   Let  A = { 1, 2, 3 }  and  B = { x / x  is  a  prime  number  < 10 }
      Find  A x B  and B x A.

15.   A  relation R  is  given  by  the  set  { (x, y) / y = x + 3,  x ∈ { 0, 1, 2, 3, 4, 5 } }
      Determine  its  domain  and  range.

16.   Let  A = { 1, 2, 3, 4 , ................ 45 } and R  be the relation  defind  as " is
      square  of " on  A. Write  R  as  a  subset  of  A x A. Also find  the  domain  and  range
of  R.

III     Answer  the  following :                    4 x 5 = 20

17.   If  A = { 5,6}, B= {4,5,6}, C={5,6,7}  show  that A x A = ( B x B ) ∩ (C x C)

18.   Given  A = { 1, 2, 3 }    B = { 2, 3, 5 }, C = { 3, 4 }  and  D = { 1, 3, 5 }
      check  if  ( A ∩ C )  x ( B ∩ D ) = ( A x B ) ∩ ( C x D )  is  true ?

19.   Let  A = The  set  of  all  natural  numbers  less  than  8,
      B = The  set  of  all  prime  numbers  less  than  8,
      C = The  set  of  even  prime  number
      Verify  that,  ( A ∩ B )  x C  = ( A x C ) ∩ ( B x C )

20.   Let  A = { 3, 4, 7, 8 }  and  B = { 1, 7, 10 }  which  of  the  following  sets  are
      relations  from  A  to B ?
      i)  $R_1$ = { ( 3, 7 ), ( 4, 7), ( 7, 10), (8,1 ) }   ii)  $R_2$ = { ( 3, 1 ), ( 4, 12 ) }

IV     Answer  the  following :  [ Practical  Geometry ]          1 x 8 = 8

21.   Draw  a  circle  of  diameter  6 cm  from  a p oint  P,  which  is  8 cm  away
      from  its  centre,  Draw  the  two  tangents  PA  and  PB  to  the  circle  and
      measure  their  lengths.

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