國立中央大學98學年度碩士班考試入學試題卷

所別：企業管理學系碩士班 企業電子化組(庚組)　科目：離散數學　共 4 頁 第 1 頁

＊請在試卷答案卷（卡）內作答

單選題，每題五分

1. Given the program of

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Counter = 0
For I := 1 to n do
  For J := 1 to I do
    Counter = counter +1
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What is the value of counter: A) n　B) n*n　C) n*(n+1)/2　D) n/2

2. In how many ways can one distribute 10 white identical marbles into 6 distinct containers?　A) 3013　B) 3003　C) 3023　D) 3033

3. Determine the Truth value assignments for the symbols of p, q, r, s, t to make the statement of $[(p \wedge q \wedge r) \rightarrow (s \vee t)]$ false
   A) p = truth; q = truth; r = truth; s = false; t = false
   B) p = truth; q = truth; r = false; s = truth; t = truth
   C) p = truth; q= truth; r = truth; s = truth; t = false
   D) p = truth; q= false; r = false; s = false; t = false

4. In the following program segment, n is an integer variable and the variable X is an array X[1], X[2], ...X[20] of 20 integer values,

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For n :=1 to 20 do
  X[n] = n * n – n
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If the universe consist of all integers from 1 to 20, which of the following statements is true

A) $\forall n\,(X[n] > 0)$　B) $\exists m,n\,(m < n) \wedge (X[m] = X[n])$

C) $\exists n\,X[n+1] = 2*X[n]$　D) $\forall m,n\,(m \neq n) \rightarrow X[m] = X[n]$

5. If $X = \{1,2,3\}$, $Y = \{3, 4, 5\}$ then $|X \cap Y|$ is equal to
   A) 1　B) 2　C) 3　D) 4

6. A university volleyball team registers a tournament to play eight games. The probability of the team will win any given game is 0.7. Which one of the following statements is true:
   A) The probability of winning eight games is $(0.8)^7$
   B) The probability of losing three games is $(0.7)^5(0.3)^3$
   C) The probability of winning at least one game is 0.7
   D) The probability of winning no games is $(0.3)^8$

背面有試題

7. Let $a_1 = 5$, $a_{n+1} = a_n + 5$, for $n > 1$, which one of the following statements is true
   A) $a_2 = 6$
   B) $a_4 = a_3 + a_2$
   C) $a_3 - a_2 = 1$
   D) $a_n = 5*n$

8. Let $(X)_Y$ be the number of X represented in base Y. Which of the following statements is true
   A) $(64)_{10} = (10010)_2$
   B) $(64)_{10} = (110)_8$
   C) $(64)_{10} = (40)_{16}$
   D) $(64)_{10} = (1)_{64}$

9. Let X = {2, 3, 4}, Y = {4, 5} and * be the Cartesian product. Which of the following statements is true?
   A) Y *Y = {(4, 5), (4, 4)}
   B) X* Y = {(2, 3), (2,4), (3,4)}
   C) X *X = {(2, 3, 4), (2, 3, 4)}
   D) Y *X = {(4, 2), (4, 3), (4, 4), (5, 2), (5, 3), (5, 4)}

10. Let X = {1, 2} and Y = {3,4}. Which of the following mappings is a function from X to Y?
   A) {(1, 3), (2, 4)}
   B) {(1, 3), (1,4)}
   C) {(1, 1), (1, 3)}
   D) {(3, 1), (4,2)}

11. Which of the following numbers can be derived from the expression of 0^*1^+1
   A) 010
   B) 111
   C) 0010
   D) 101

參考用

12. How many possible integer solutions are there for the equation of c1+c2+c3 = 6, where $0 < c_i < 3$

A) 4
B) 5
C) 6
D) 7

13. Determine the number of vertices for a graph with edge of 9 and all vertices have degree 3.

A) 2
B) 3
C) 4
D) 5

14. If the preorder traversal of a complete binary tree is represented as 1, 2, 3, 4, 5, 6, 7, what is the post order traversal of the same tree

A) 3, 4, 2, 6, 7, 5, 1
B) 3, 2, 4, 6, 5, 7, 1
C) 1, 5, 2, 4, 7, 6, 3
D) 5, 1, 7, 3, 2, 4, 6

15. Which of following expressions can generate the number 00110

A) 1^*0^+1
B) 1^*001^+0
C) 0^+1^*
D) 0^+1^+

16. If X = {1, 2}, Y = {3, 4} then X – Y =

A) {1, 2}
B) {1, 3}
C) {3, 4}
D) {2, 4}

參考用

17. Which of the following description is not among the feature of trees

A) A tree is a connected graph

B) A tree has no loop

C) A tree has a root

D) A tree has even number of vertices

18. Given a set X = {1, 2, 3}, which of the following statements is true

A) R = {(1,2), (2,2)} is symmetric

B) R = {(1,1), (2,2), (3,2)} is reflexive

C) R= {(1,2), (2,2), (3,3), (2,1)} is symmetric

D) R = {(1,2), (2,3), (3,3), (2,2)} is reflexive

19. Suppose the Probability distribution for X is

x	Pr(X = x)
1	1/5
3	2/5
4	1/5
6	1/5

The E(X) is equal to

A) 15/5

B) 17/5

C) 19/5

D) 13/5

20. If X = {1, 2, 3, 4, 5}, Y = {1, 2, 3, 4} then which of the following statements is true:

A) $X \subset Y$

B) $X - Y = Y$

C) $X \cup Y = X$

D) $X \cap Y = X$

參考用