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|---|---|
| **Started on** | Tuesday, 24 November 2020, 3:09 PM |
| **State** | Finished |
| **Completed on** | Tuesday, 24 November 2020, 4:45 PM |
| **Time taken** | 1 hour 35 mins |
| **Marks** | 67.0/80.0 |
| **Grade** | **8.4** out of 10.0 (**84**%) |

Question **1**

Complete

Mark 0.0 out of 1.0

[537] Given the following recursive algorithm. What is the output of the following code? for i:=1 to 5 do print(vzar(i))

```
procedure vzar(n : positive integer)
    if n < 3 then return n
    else return 3*vzar(n-1) - 2*vzar(n-2)
```

Select one:

- None
- 1, 2, 4, 8, 16
- 1, 2, 4, 6, 8
- 5, 5, 5, 5, 5
- 1, 2, 3, 4, 5

The correct answer is: None

Question **2**

Complete

Mark 1.0 out of 1.0

[416] Which of the following are PRIMES?

Select one:

- 135794 and 23570
- 29 and 31
- None of the others
- 77 and 11

The correct answer is: 29 and 31

Question **3**

Complete

Mark 1.0 out of 1.0

[850] Write the postfix expression of the infix expression((x + 8) * (y – 7)) + 2.

Select one:

- x 8 y 7 2 + - * +
- x 8 y 7 + - * 2 +
- x 8 + y 7 - * 2 +
- None of the others

The correct answer is: x 8 + y 7 - * 2 +

Question **4**

Complete

Mark 0.0 out of 1.0

[845] Given a binary search tree containing values 5, 4, 0, 1, 2, 3, 6, 7. After the value of 8 is inserted. The result when the inorder traversal algorithm is applied on the tree is _____

Select one:

- 5 4 0 1 2 3 6 7 8
- 5 4 0 1 8 2 3 6 7
- 0 1 2 3 4 5 6 7 8
- None of the others
- 8 7 6 5 4 3 2 1 0

The correct answer is: 0 1 2 3 4 5 6 7 8

Question **5**

Complete

Mark 1.0 out of 1.0

[602] How many digit-strings of length 10, start with 44 and end with 9?

Select one:

- 2^8 + 2^9 – 2^7
- 10^8 + 10^9 – 10^7
- 10^7
- 2^7

The correct answer is: 10^7

Question **6**

Complete

Mark 1.0 out of 1.0

[7016] The graph K3,7 has ____ edges and ____ vertices.

Select one:

- 10, 21
- 21, 10
- 10, 10
- 21, 21

The correct answer is: 21, 10

Question **7**

Complete

Mark 1.0 out of 1.0

[235] If f: Z → N; f(x) = (2 - x) * (2 - x). Which of the following statements is(are) true? (i) f is one-to-one (ii) f is onto

Select one:

- None
- Both
- (i)
- (ii)

The correct answer is: (ii)

Question **8**

Complete

Mark 1.0 out of 1.0

[104] Which of these following statements are FALSE (where ¬ is the negation)?

**(i)**

$p \rightarrow q$
$p$
---
$\therefore q$

**(ii)**

$p \rightarrow q$
$q \rightarrow r$
---
$\therefore p \rightarrow r$

**(iii)** $[p \wedge (q \vee p)] \equiv p$

**(iv)** $p \rightarrow q \equiv \neg p \rightarrow \neg q$

Select one:

- (iv)
- (i)
- (ii)
- None
- (iii)

The correct answer is: (iv)

Question **9**

Complete

Mark 1.0 out of 1.0

[312] Which of the following functions is to correct for finding the position of an element in the array of integers?

a.
```
int  binary-search(element  x, array a, int i, int j)
{
        if  (i > j) then return -1; // not found
        m = (i+j) / 2;
        if (x = a[m]) return m;
        if (x > a[m]) return binary-search(x,  a,  i, m-1);
        return  binary-search(x,  a, m+1, j);
}
```

b.
```
int  binary-search(element  x, array a, int i, int j)
{
        if  (i > j) then return -1; // not found
        m = (i+j) / 2;
        if (x = a[m]) return m;
        if (x < a_m) return binary-search(x,  a,  i, m-1);
        return  binary-search(x,  a, m+1, j);
}
```

c.
```
int  binary-search(element  x, array a, int i, int j)
{
        m = (i+j) / 2;
        if (x = a[m]) return m;
        if (x < a[m]) return binary-search(x,  a,  i, m-1);
        return  binary-search(x,  a, m+1, j);
}
```

d.
```
int  binary-search(element  x, array a, int i, int j)
{
        if  (i > j) then return -1; // not found
        m = (i+j) / 2;
        if (x = a[m]) return m;
        if (x < a[m]) return binary-search(x,  a,  1, m-1);
        return  binary-search(x,  a, m+1, n);
}
```

Select one:

- c.
- b.
- d.
- a.

The correct answer is: b.

Question **10**

Complete

Mark 0.0 out of 1.0

[307] Which of the following functions is to correct for FINDING the position of integer z in the array a of integers sorted in increasing order, if we call "int result = bsearch(a, 1, n, z)"?

a.
```
int bsearch(integer array a of a[1], a[2], ..., a[n]; d, c and z: integer)
{
        if (d > c) then
                return 0; // not found
        g = (d+c) / 2;
        if (z == a[g])
                return g;
        if (z < a[g])
                return bsearch(a, d, g-1, z);
        return bsearch(a, g+1, c, z);
}
```

b.
```
int bsearch(integer array a of a[1], a[2], ..., a[n]; d, c and z: integer)
{
        if (d > c) then
                return 0; // not found
        g = (d+c) / 2;
        if (z == a[g])
                return g;
        if (z > a[g])
                return bsearch(a, d, g-1, z);
        return bsearch(a, g+1, c, z);
}
```

c.
```
int bsearch(integer array a of a[1], a[2], ..., a[n]; d, c and z: integer)
{
        g = (d+c) / 2;
        if (z == a[g])
                return g;
        if (z < a[g])
                return bsearch(a, d, g-1, z);
        return bsearch(a, g+1, c, z);
}
```

d.
```
int bsearch(integer array a of a[1], a[2], ..., a[n]; d, c and z: integer)
{
        g = (d+c) / 2;
        if (z == a[g])
                return g;
        if (z > a[g])
                return bsearch(a, d, g-1, z);
        return bsearch(a, g+1, c, z);
}
```

Select one:

- c.
- b.
- d.
- a.

The correct answer is: a.

Question **11**

Complete

Mark 1.0 out of 1.0

[431] Convert hexa decimal (BC1) to base 2.

Select one:

- 1011 1010 0001
- 1011 1001 0001
- 1011 1100 0001
- 1011 1101 0001

The correct answer is: 1011 1100 0001

Question **12**

Complete

Mark 0.0 out of 1.0

[7064] There are ___ non-zero entries in an adjacent matrix representing the graph K5.

Select one:

- 12
- 10
- 15
- 20

The correct answer is: 20

Question **13**

Complete

Mark 1.0 out of 1.0

[7041] How many edges does a graph have if its degree sequence is 4, 3, 3, 2, 1, 1, 0?

Select one:

- 28
- 7
- 14
- 6

The correct answer is: 7

Question **14**

Complete

Mark 0.0 out of 1.0

[202] Let the rules of f: N→N, f(n) = n mod 3; g: R→N, g(x) = floor(n). h: Z→Z, h(z) = z+1 is a bijective! Which of the following is/are true?

Select one:

- f is injective, g is injective
- f is injective, g is onto
- f is onto, g is onto, and h is not bijective.
- f is onto, g is onto, and h is bijective.
- f is onto, g is injective

The correct answer is: f is onto, g is onto, and h is bijective.

Question **15**

Complete

Mark 1.0 out of 1.0

[501] The solution to the recurrence relation A[n]=A[n-1]+2.n, with initial term A[0]=2 are A[n] = _____.

Select one:

- [n * (n+1)] + 2
- 5 * (n+1)/2
- 4*n + 7
- 3 * (n^2)

The correct answer is: [n * (n+1)] + 2

Question **16**

Complete

Mark 1.0 out of 1.0

[159] Determine whether the logically equivalence is distribute law?

Select one:

- p ∧ (q ∨ r) ≡ (p ∧ q) ∨ (p ∧ r)
- None
- p ∧ (p ∨ q) ≡ p
- p ∨ (p ∧ q) ≡ p

The correct answer is: p ∧ (q ∨ r) ≡ (p ∧ q) ∨ (p ∧ r)

Question **17**

Complete

Mark 1.0 out of 1.0

[304] The big-O notation for f(x) = 5logx is

Select one:

- x
- x^2
- 1
- x^3

The correct answer is: x

Question **18**

Complete

Mark 1.0 out of 1.0

[613] How many bit strings of length FIVE, START with bit 0?

Select one:

- 2+2+2+2+2
- 2+2+2+2
- 2^5
- 2^4

The correct answer is: 2^4

Question **19**

Complete

Mark 1.0 out of 1.0

[645] How many six-character passwords can be formed if characters are chosen from the set {a, b, ..., z}, with repeated letters are allowed?

Select one:

- 26^6
- 156
- None
- 26!

The correct answer is: 26^6

Question **20**

Complete

Mark 1.0 out of 1.0

[163] Determine whether the argument given here is valid.(i) "If CôVy works hard then she will pass the examination. We know that she did not work hard. Consequently, Cô-Vy will not pass the examination."(ii) "If Thoong is good at learning he will get a prize. Assume that he did not get a prize. Therefore, he is not good at learning."

Select one:

- All
- none
- (ii) only
- (i) only

The correct answer is: (ii) only

Question **21**

Complete

Mark 1.0 out of 1.0

[114] Let P:If Sahil bowls, Saurabh hits a century. ,Q: If Raju bowls , Sahil gets out on first ball. Now if P is true and Q is false then which of the following can be true?

Select one:

- Sahil bowled and Saurabh hits a century
- Sahil bowled and Saurabh got out
- Raju did not bowled
- Raju bowled and Sahil got out on first ball

The correct answer is: Sahil bowled and Saurabh hits a century

Question **22**

Complete

Mark 0.0 out of 1.0

[134] Let p and q be the propositions: p: You drive over 65 miles per hour. q: You get a speeding ticket.Write the following proposition "You get a speeding ticket, but you do not drive over 65 miles per hour", using p, q and logical connectives.

Select one:

- $q \rightarrow p$
- $q \wedge p$
- $q \vee p$
- $p \rightarrow q$

The correct answer is: $q \wedge p$

Question **23**

Complete

Mark 0.0 out of 1.0

[406] What are the QUOTIENT and the REMAINDER of the integer division of –30 by 4?

Select one:

- –8 and –2
- –7 and 2
- –7 and –2
- –8 and 2

The correct answer is: –7 and –2

Question **24**

Complete

Mark 1.0 out of 1.0

[858] Find the postfix form of the infix expression (3 * x + y) * (x – y).

Select one:

- None of the others
- x 3 * y + x y - *
- 3 x * y + x y - *
- * + * 3 x y - x y

The correct answer is: 3 x * y + x y - *

Question **25**

Complete

Mark 1.0 out of 1.0

[625] How many one-to-one functions are there from the set {a, b, c} to the set {1, 2, 3, 4, 5, 6}?

Select one:

- 6.5.4
- 6^3
- 18
- None

The correct answer is: 18

Question **26**

Complete

Mark 1.0 out of 1.0

[161] Let P(x) and Q(x) be two statements of "x is a prime number.", "x is odd". The domain consists of all positive integers. Let R and S be the quantifications of "$\forall x\,[P(x) \rightarrow Q(x)]$" and "$\exists x\,[P(x) \wedge \neg Q(x)]$", respectively. What are the truth values of R and S?

Select one:

- R is false and S is true
- R is true and S is false
- R is false and S is false
- R is true and S is true

The correct answer is: R is false and S is true

Question **27**

Complete

Mark 1.0 out of 1.0

[281] Given that X = {x ∈ N | 0 ≤ x ≤ 6 and x is odd}. Show the power set P(X) - the set of all subsets of X.

Select one:

- {{1}, {5}, {3}, {1, 5}, {1, 3}, {5, 3}}
- {{1}, {5}, {3}, {1, 5}, {1, 3}, {5, 3},{1,5,3}}
- {∅, {1}, {5}, {3}, {1, 5}, {1, 3}, {5, 3},{1,5,3}}
- {1,3,5}
- {∅,{1}, {5}, {3}, {1, 5}, {1, 3}, {5, 3}}

The correct answer is: {∅, {1}, {5}, {3}, {1, 5}, {1, 3}, {5, 3},{1,5,3}}

Question **28**

Complete

Mark 1.0 out of 1.0

[421] Find the BASE 2 expansion of the integer 16.

Select one:

- 10000
- 11111
- 11011
- 00001

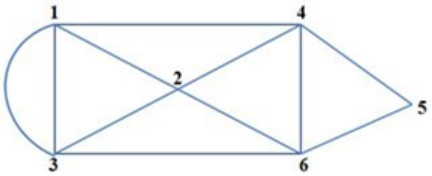
The correct answer is: 10000

Question **29**

Complete

Mark 1.0 out of 1.0

[7075] Given the graph. Which statement(s) is (are) TRUE?




Select one:

- The graph has no Euler circuit.
- An Euler circuit is 1 2 3 1 3 6 4 5 6 2 4 1
- An Euler circuit is 1 3 4 5 6 1
- An Euler circuit is 1 2 3 4 5 6 3 1

The correct answer is: An Euler circuit is 1 2 3 1 3 6 4 5 6 2 4 1

Question **30**

Complete

Mark 1.0 out of 1.0

[103] Determine the NEGATION of the logical expression (where ¬ is the negation)$\exists x\ (P(x) \vee Q(x))$

**(i) $\forall x\ (\neg P(x) \wedge \neg Q(x))$**
**(ii) $\forall x\ (P(x) \vee Q(x))$**
**(iii) $\forall x\ (\neg P(x) \vee \neg Q(x))$**
**(iv) $\forall x\ (P(x) \wedge Q(x))$**

Select one:

- (ii)
- (i)
- (iv)
- (iii)

The correct answer is: (i)

Question **31**

Complete

Mark 1.0 out of 1.0

[325] Consider the algorithm:The complexity of the algorithm is _____(Choose the best option)

procedure max($a_1, a_2, \ldots, a_n$: reals )
max:=$a_1$
for i:=2 to n
if max<$a_i$ then max:=$a_i$

Select one:

- O(n log(n))
- O(n)
- O(n^2)
- O(1)

The correct answer is: O(n)

Question **32**

Complete

Mark 0.0 out of 1.0

[250] Consider the function f from the set {1, 2, 3, 4} to itself, f={(1, 2), (2,3), (3,1), (4,3)}. Choose correct statement(s).

Select one:

- f is not onto and not one-to-one
- f is not one-to-one and onto
- f is one-to-one and onto
- f is not one-to-one and not onto

The correct answer is: f is not onto and not one-to-one

Question **33**

Complete

Mark 1.0 out of 1.0

[538] Given a recursive algorithmWhat is the output after calling calcu(2.4, 5)?

```
procedure calcu(a: real number, n: positive integer)
    if n = 1 then calcu(a, n):= a
    else calcu(a, n) := a + calcu(a, n - 1)
```

Select one:

- 12
- None
- 2.4
- 7.4
- 6.4

The correct answer is: 12

Question **34**

Complete

Mark 1.0 out of 1.0

[7049] Determine whether a graph with the degree sequence 4, 3, 2, 2, 2, 1 has a Hamilton path, a Hamilton circuit.

Select one:

- Hamilton path: no, Hamilton circuit: yes
- Hamilton path: yes, Hamilton circuit: no
- Hamilton path: no, Hamilton circuit: no
- Hamilton path: yes, Hamilton circuit: yes

The correct answer is: Hamilton path: yes, Hamilton circuit: no

Question **35**

Complete

Mark 1.0 out of 1.0

[870] Set up a binary search tree for the following list 5.5, 3.3, 6.6, 2.2, 4.4, 7.7. Write the PRE-ORDER traversal of the tree.

Select one:

- None of the others
- 2.2, 3.3, 4.4, 5.5, 6.6, 7.7
- 5.5, 3.3, 2.2, 4.4, 6.6, 7.7
- 2.2, 4.4, 3.3, 7.7, 6.6, 5.5

The correct answer is: 5.5, 3.3, 2.2, 4.4, 6.6, 7.7

Question **36**

Complete

Mark 1.0 out of 1.0

[657] How many bit strings of length four which no three consecutive (liên tiếp) 0s, using a tree diagram to count.

Select one:

- None
- 13
- 12
- 14
- 15

The correct answer is: 13

Question **37**

Complete

Mark 1.0 out of 1.0

[824] Which one is a prefix code?(i) A: 01 B: 101 C: 111 D: 00(ii) A: 101 B: 010 C: 111 D: 1001

Select one:

- Both
- (i) only
- (ii) only
- None

The correct answer is: Both

Question **38**

Complete

Mark 1.0 out of 1.0

[520] By induction hypothesis, for any positive integer n, the sum 1*(1!) +2*(2!)+...+n*(n!) can be equivalent to:

Select one:

- (n^2) - 1
- (n+2)! - 2
- (n+2)! - n
- (n+1)! - 1

The correct answer is: (n+1)! - 1

Question **39**

Complete

Mark 1.0 out of 1.0

[546] Consider the algorithm:What is the output if n = 15?

```
procedure tinh(n : positive integer)
if n = 1 return 1
else return n + tinh(n-1)
```

Select one:

- 16
- None
- 225
- 15
- 120

The correct answer is: 120

Question **40**

Complete

Mark 1.0 out of 1.0

[624] How many integers in {1, 2, 3, ..., 100} are divisible by 2 but not by 5 ?

Select one:

- 39
- 40
- 50
- None
- 49

The correct answer is: 40

Question **41**

Complete

Mark 1.0 out of 1.0

[262] If a set A has 3 elements, then number of elements in (A × A) × A is ____

Select one:

- 27
- None
- 9
- 2^27

The correct answer is: 27

Question **42**

Complete

Mark 0.0 out of 1.0

[260] Let N = {0, 1, 2, 3, ...} and f: N → N; f(n) = (n-3)^2Which one is true? (i) f(6) = f(0) (ii) f is one-to-one

Select one:

- None
- Both
- (ii)
- (i)

The correct answer is: (i)

Question **43**

Complete

Mark 1.0 out of 1.0

[423] How may prime numbers are there between 1 to 20?

Select one:

- 7
- 5
- 8
- 6

The correct answer is: 8

Question **44**

Complete

Mark 1.0 out of 1.0

[7048] Given the adjacency matrix of an undirected graph with vertices {a, b, c} abca 213b 10 1c 310How many paths of length 2 are there from the vertex b to the vertex a in this graph?

Select one:

- 5
- 3
- 6
- 4
- None of the others

The correct answer is: 4

Question **45**

Complete

Mark 1.0 out of 1.0

[622] How many 15 bit-strings either start with 00 or end with 111?

Select one:

- (2^13) * (2^12) * (2^10)
- 2^10
- (2^13) + (2^12) - (2^10)
- (2^13) + (2^12)

The correct answer is: (2^13) + (2^12) - (2^10)

Question **46**

Complete

Mark 1.0 out of 1.0

[519] For any integer m>=3, the series 1+3+5+...+(2*m-1) can be equivalent to ___

Select one:

- 3 * m * m + 4
- m * m
- m + 1
- 2 * m + 2

The correct answer is: m * m

Question **47**

Complete

Mark 1.0 out of 1.0

[654] How many different license plates can be made if each plate contains a sequence of three English letters (NOT CASE-SENSITIVE) followed by three digits, given that they have distinct letters and digits?

Select one:

- 11232000
- 17576000
- 140608000
- 95472000

The correct answer is: 95472000

Question **48**

Complete

Mark 1.0 out of 1.0

[319] Suppose that we have the following sequence 1, 3, 5, ,7, 8, 9, ..., 99, 2, 4, 6, 8, 10, ....., 100If the binary search algorthm is applied on two halves of the sequence. What is the total complexity of this operation?

Select one:

- O(3n)
- O(logn)
- O(n)
- O(n/2)
- None

The correct answer is: O(logn)

Question **49**

Complete

Mark 0.0 out of 1.0

[249] Study the following statements, where A is the set {a,b,c}.

(i) $\mathrm{P}(A)$ has 8 elements
(ii) $\{a\} \in A$

Select one:

- false, false
- false, true
- true, false
- true, true

The correct answer is: true, false

Question **50**

Complete

Mark 1.0 out of 1.0

[504] For any integer n >= _____, we can prove by mathematical induction that n! < pow(n,n) (the power of n with n times, n.n...n).

Select one or more:

- [x] 2
- [ ] 0
- [x] 3
- [ ] 1

The correct answers are: 2, 3

Question **51**

Complete

Mark 1.0 out of 1.0

[135] For each of these arguments determine whether the argument is valid or not valid.(i) Everyone enrolled in the university has lived in a dormitory. Mia has never lived in a dormitory. Therefore, Mia is not enrolled in the university.(ii) A convertible car is fun to drive. Isaac's car is not a convertible. Therefore, Isaac's car is not fun to drive.

Select one:

- (i): invalid, (ii): invalid
- (i): valid, (ii): not valid
- (i): inalid, (ii): valid
- (i): valid, (ii): valid

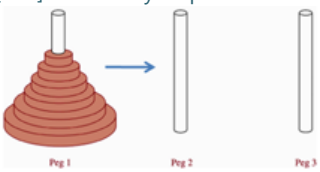
The correct answer is: (i): valid, (ii): not valid

Question **52**

Complete

Mark 1.0 out of 1.0

[608] How many steps needed to move n disks on the peg 1 to peg 2 with intermediate peg 3, whenever n is a nonnegative integer?




Select one:

- 2^n - 1
- 2^(n-1)
- 2^n + 1
- 2^n

The correct answer is: 2^n - 1

Question **53**

Complete

Mark 1.0 out of 1.0

[552] Which of the following function can be used to locate an element x in a DECREASING array by binary search method?

```
int bsearch(int a[100], int x, int dau, int cuoi)
{
    int giua = a[(d + c)/2];
    if (x > a[giua]) return bsearch(a, x, giua + 1, cuoi);
    if (x < a[giua]) return bsearch(a, x, dau, giua - 1);
    return giua; // x is at giua
}

int bsearch_1(int a[100], int x, int dau, int cuoi)
{
    if (dau > cuoi) return -1; // not found
    int giua = a[(d + c)/2];
    if (x > a[giua]) return bsearch_1(a, x, giua + 1, cuoi);
    if (x < a[giua]) return bsearch_1(a, x, dau, giua - 1);
    return giua; // x is at giua
}

int bsearch_2(int a[100], int x, int dau, int cuoi)
{
    if (dau > cuoi) return -1; // not found
    int giua = a[(d + c)/2];
    if (x < a[giua]) return bsearch_2(a, x, giua + 1, cuoi);
    if (x > a[giua]) return bsearch_2(a, x, dau, giua - 1);
    return giua; // x is at giua
}
```

Select one:

- bsearch_1
- None
- bsearch
- bsearch_2

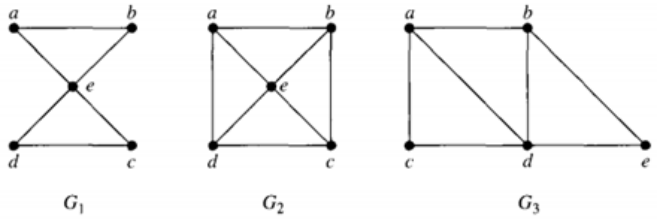
The correct answer is: bsearch_2

Question **54**

Complete

Mark 1.0 out of 1.0

[7107] Let 3 undirected graphs. Select CORRECT statements:




Select one:

- Only one of them has an Euler circuit
- Each of them has an Euler path.
- Each of them has an Euler curcuit
- No graph has both Euler path and Euler circuit

The correct answer is: Only one of them has an Euler circuit

Question **55**

Complete

Mark 1.0 out of 1.0

[408] The binary notation of 231 is

Select one:

- 11100111
- 11100011
- 11010111
- 10111011

The correct answer is: 11100111

Question **56**

Complete

Mark 1.0 out of 1.0

[322] What is the best big-O complexity of the algorithm above?

```
procedure tim(a1, a2, a3, ..., an: integers)
for i:= 2 to n
    for k:=1 to i-1
        if ak = ai then
            print(k)
            break
```

Select one:

- None of the others
- O(n^2)
- O(n)
- O(log n)
- O(n log(n))

The correct answer is: O(n^2)

Question **57**

Complete

Mark 1.0 out of 1.0

[303] Which is the big-O estimate of worst–complexity of Merge sort.

Select one:

- O(n^3)
- O(n^2)
- O(n * log(n))
- O(n)

The correct answer is: O(n * log(n))

Question **58**

Complete

Mark 1.0 out of 1.0

[7053] The degree sequence of a graph is the sequence of the degrees of the vertices of the graph in nonincreasing order. Select an invalid degree sequence of a simple graph.

Select one:

- 8, 8, 6, 6, 3, 3, 2, 2
- 7, 7, 6, 6, 4, 4, 1
- 6, 6, 5, 5, 4, 4, 2, 2
- 5, 5, 3, 3, 2, 2, 1, 1

The correct answer is: 7, 7, 6, 6, 4, 4, 1

Question **59**

Complete

Mark 1.0 out of 1.0

[407] DECRYPT the message “CRR” by Caesar cipher.

Select one:

- DSS
- TOO
- ZOO
- ANN

The correct answer is: ZOO

Question **60**

Complete

Mark 1.0 out of 1.0

[868] Use HUFFMAN coding to encode the following symbols with the frequencies listed: A: 0.08, B: 0.10, C: 0.12, D: 0.15, E: 0.20, F: 0.35. The encoding produced encodes

Select one:

- A by 00, B by 10, C by 010, D by 011, E by 110, and F by 111
- None of the others
- A by 111, B by 110, C by 010, D by 011, E by 10, and F by 00
- A by 111, B by 110, C by 011, D by 010, E by 10, and F by 00

The correct answer is: A by 111, B by 110, C by 011, D by 010, E by 10, and F by 00

Question **61**

Complete

Mark 1.0 out of 1.0

[833] Using alphabetical order, construct a binary search tree for the words in the sentence “Men make houses, women make homes.” How many comparisons are needed to locate the word “homes”?

Select one:

- 3
- 2
- None of the others
- 4
- 1

The correct answer is: 4

Question **62**

Complete

Mark 1.0 out of 1.0

[405] Which of the following is the GREATEST COMMON DIVISOR of 120 and 80 (using their prime factorizations as follows:120=2.2.2.3.5, 80=2.2.2.2.5)?

Select one:

- (2^3) * 5
- (2^3) * 3 * 5
- (2^3) * 3 * 5 * (2^4) * 5
- (2^4) * 3 * 5 * (2^4) * 5

The correct answer is: (2^3) * 5

Question **63**

Complete

Mark 1.0 out of 1.0

[435] Suppose that a computer has only the memory locations 0, 1, 2, ..., 29. Using the hashing function h where h(x) = (x + 5) mod 30 to determine the memory locations in which 97, 32, and 16 are stored, we have

Select one:

- 12, 7, 16
- 7, 2, 16
- 12, 2, 16
- None
- 12, 7, 21

The correct answer is: 12, 7, 21

Question **64**

Complete

Mark 1.0 out of 1.0

[329] Give a big-O estimate for (x^2 + x logx) * (2x + 3).

Select one:

- O(x log(x))
- O(x^2 log(x))
- O(x^2)
- O(x^3)

The correct answer is: O(x^3)

Question **65**

Complete

Mark 1.0 out of 1.0

[634] A multiple-choice test contains 8 questions. There are four possible answers for each question. In how many ways can a student answer the questions on the test if the student answers every question?

Select one:

- 4^8
- 1
- 32
- None of the others
- 8^4

The correct answer is: 4^8

Question **66**

Complete

Mark 1.0 out of 1.0

[426] Find correct statements

Select one:

- 290 mod 17=1 and -88 mod 13=9
- 290 mod 17=1; -88 mod 13=10
- 290 mod 17=1 and -88 mod 13=-3
- 290 mod 17=1 and -88 mod 13=3

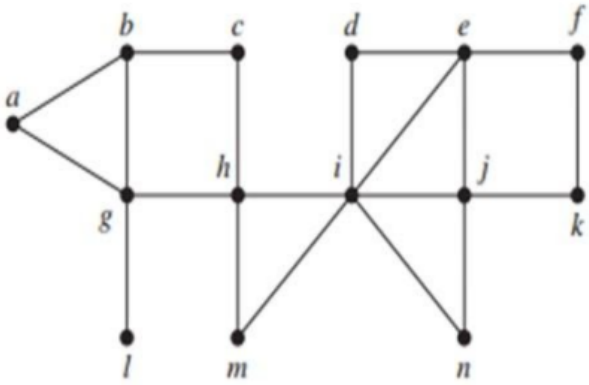
The correct answer is: 290 mod 17=1 and -88 mod 13=3

Question **67**

Complete

Mark 0.0 out of 1.0

[878] Use DEPTH-first search to produce a spanning tree for the given simple graph. Choose a as the root of this spanning tree and assume that the vertices are ordered alphabetically.




Select one:

- None
- a b c h g l i d e f j k m n
- a b c d e f g h i j k l m n
- a b g c h l m i d e j n f k
- a b c h g l i d e f k j n m

The correct answer is: a b c h g l i d e f k j n m

Question **68**

Complete

Mark 0.0 out of 1.0

[7001] Study a simple graph having the degree sequence {5,5,4,4,4,3,3,2,2,2,2, 1,1}. This graph has _____ edges.

Select one:

- None of the others.
- 17
- 38
- A number between 20 and 38.
- 19

The correct answer is: 19

Question **69**

Complete

Mark 1.0 out of 1.0

[330] The big-O notation for f(x) = 4 logx + 2 is

Select one:

- O(x)
- O(logx)
- None
- O(1)

The correct answer is: O(logx)

Question **70**

Complete

Mark 1.0 out of 1.0

[801] Use Huffman coding algorithm to encode the word "football". What is the average number of bits required to encode a character?

Select one:

- 2.45
- None of the others
- 2.35
- 2.25
- 2.5

The correct answer is: None of the others

Question **71**

Complete

Mark 1.0 out of 1.0

[233] Study the following rules: (i) f: Z → R; f(x) = 1/(2x-1) (ii) f: R → R; f(x) = 1/(2x-1)Which rule describe(s) a function(s)?

Select one:

- (i)
- Both
- None
- (ii)

The correct answer is: (i)

Question **72**

Complete

Mark 1.0 out of 1.0

[338] Find big-O estimate of worst–COMPLEXITY of LINEAR SEARCH algorithm for finding the position of an element in an array of integers.

Select one:

- O(n)
- O(n^2)
- O(log n)
- O(1)

The correct answer is: O(n)

Question **73**

Complete

Mark 1.0 out of 1.0

[242] The sum of the first n negative integers (-1, -2, -3, ..., -n) is given by:

Select one:

- - [n * (n-1)] / 2
- [n * (n+1)] / 2
- [n * (n-1)] / 2
- - [n * (n+1)] / 2

The correct answer is: - [n * (n+1)] / 2

Question **74**

Complete

Mark 1.0 out of 1.0

[529] Which of the following is a recursive definition of the set of bit strings S = {1, 111, 11111, 1111111,...}? (i) String 1 is in S; If string x is in S, then so x11 is.(ii) String 1 is in S; If string x is in S, then so x1 is.

Select one:

- (ii)
- None
- Both
- (i)

The correct answer is: (i)

Question **75**

Complete

Mark 1.0 out of 1.0

[811] What is the value of following postfix expression: 3 4 * 5 3 - + 2 2 ^ *

Select one:

- 12
- 56
- 37
- 9

The correct answer is: 56

Question **76**

Complete

Mark 1.0 out of 1.0

[518] Which of the following is the base case for pow(4,n+1) > pow(n+1,2)?

Select one:

- 54 > 8
- 16 > 2
- 64 > 9
- 27 < 91

The correct answer is: 64 > 9

Question **77**

Complete

Mark 1.0 out of 1.0

[111] Determine the NEGATION of the logical expression (where ¬ is the negation) $\forall x\,(P(x) \wedge Q(x))$

| | |
|---|---|
| a. | $\exists x\,(\neg P(x) \wedge \neg Q(x))$ |
| b. | $\exists x\,(P(x) \vee \neg Q(x))$ |
| c. | $\exists x\,(P(x) \wedge \neg Q(x))$ |
| d. | $\exists x\,(\neg P(x) \vee \neg Q(x))$ |

Select one:

- d.
- a.
- c.
- b.

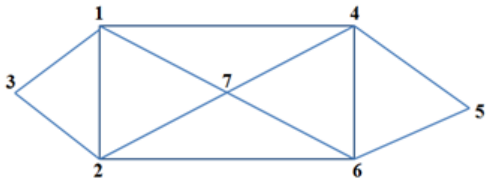
The correct answer is: d.

Question **78**

Complete

Mark 1.0 out of 1.0

[7094] Given the graph. Which statement(s) is (are) TRUE?




Select one:

- The graph has no Euler circuit
- An Euler circuit is 1 2 3 4 5 6 7 1
- An Euler circuit is 1 4 6 7 4 5 6 2 7 1 2 3 1
- An Euler circuit is 1 3 2 7 6 5 4 1

The correct answer is: An Euler circuit is 1 4 6 7 4 5 6 2 7 1 2 3 1

Question **79**

Complete

Mark 1.0 out of 1.0

[205] "Suppose that a person deposits $10K in a savings account at a bank yielding 11% per year with interest compounded annually. Then, (i) The account after 30 years is [(1.11 ^ 30) * 10] K. (ii) The account after 30 years is [(1.11 * 30) * 10] K. (iii) The account after 30 years is [(111 * 30) ^ 10] K.Determine whether that conclusion is valid.

Select one:

- (ii)
- (iii)
- None
- (i)

The correct answer is: (i)

Question **80**

Complete

Mark 0.0 out of 1.0

[132] Suppose c: It is cold d: It is dryWrite “It is neither cold nor dry” in symbols.

Select one:

- c ∧ d
- c ∧ d
- None of the others
- c v d
- c v d

The correct answer is: c ∧ d