Summary in Graph

Exam Summary (GO Classes CS Test Series 2025 | MOCK GATE | Test 6)

Qs. Attempted:	**1** (1 + 0)	**Correct Marks:**	**1** (1 + 0)
Correct Attempts:	**1** (1 + 0)	**Penalty Marks:**	**0** (0 + 0)
Incorrect Attempts:	**0** (0 + 0)	**Resultant Marks:**	**1** (1 + 0)

Total Questions:	**65** (30 + 35)
Total Marks:	**100** (30 + 70)
Exam Duration:	**180 Minutes**
Time Taken:	**0 Minutes**

EXAM RESPONSE | EXAM STATS | FEEDBACK

Aptitude

Q #1 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Quantitative Aptitude

In an Ing *sequence*, the first term is a positive integer, and each term after the first is determined in the following way:

- if a term, x, is odd, the next term is $x + 3$, and
- if a term, x, is even, the next term is $x + 4$.

For example, if the first term in an Ing sequence is 13, then the second term is 16, and the third term is 20.

If the first term in an Ing sequence is 7, what is the fifth term in the sequence?

A. 20
B. 21
C. 22
D. 23

Your Answer: | **Correct Answer: C** | Not Attempted | Time taken: 00min 02sec | Discuss

Q #2 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Analytical Aptitude

In a magic square, the numbers in each row, the numbers in each column, and the numbers on each diagonal have the same sum. In the magic square shown, the value of x is _____.

2.3		
3.6	3	2.4
	x	

A. 3.6
B. 3.1
C. 2.9
D. 2.2

Your Answer: | Correct Answer: D | Not Attempted | Time taken: 00min 00sec | Discuss

Q #3 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Quantitative Aptitude

Train 1 is travelling from Amville to Batton at a constant speed. Train 2 is travelling from Batton to Amville at a constant speed. The distance from Batton to Amville is $810\ \mathrm{km}$.

Train 2 travels $2/3$ of the distance to Amville in 6 hours. How fast is the train going?

A. $90\ \mathrm{km/h}$
B. $60\ \mathrm{km/h}$
C. $30\ \mathrm{km/h}$
D. $80\ \mathrm{km/h}$

Your Answer: | Correct Answer: A | Not Attempted | Time taken: 00min 00sec | Discuss

Q #4 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Verbal Aptitude

Fill in the blanks with the most appropriate words.

A plane arrived _____ the airport _____.

A. in/late
B. at/lately
C. at/late
D. in/lately

Your Answer: | Correct Answer: C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #5 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Quantitative Aptitude

Emily sets up a lemonade stand. She has one-time set-up costs of $\$12.00$ and after that, each cup of lemonade costs her $\$0.15$ to make. She sells each cup of lemonade for $\$0.75$.

What is the number of cups that she must sell to break even (that is, to have a profit of $\$0$)?

A. 10
B. 15

C. 20
D. 25

Your Answer: | Correct Answer: C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #6 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Verbal Aptitude

He is so lazy that he _____

A. always extends help to others to complete their work.
B. dislikes to postpone the work that he understands to do.
C. can seldom complete his work on time.
D. can’t delay the schedule of completing the work.

Your Answer: | Correct Answer: C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #7 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Quantitative Aptitude

A positive integer is divisible by 3 exactly when the sum of its digits is divisible by 3. A positive integer is divisible by 4 exactly when the positive integer formed by its last two digits is divisible by 4.

The five-digit positive integer ABABA is divisible by 4 and not divisible by 3.

Determine the number of different pairs of non-zero digits A and B that are possible -

A. 5
B. 10
C. 12
D. 14

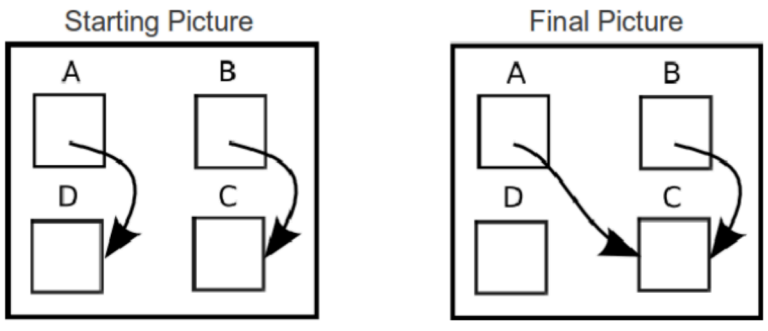
Your Answer: | Correct Answer: C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #8 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Analytical Aptitude

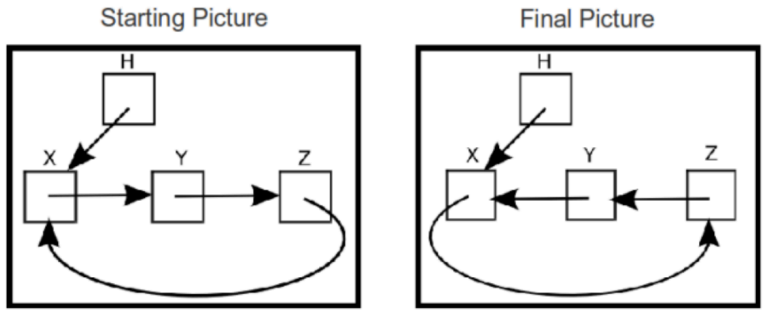
The instruction $A \leq B$ changes a picture of boxes and arrows in the following way:

- The arrow which points out of the box labeled A is removed.
- Then, a new arrow out of the box labeled A is added. This new arrow points to the same box as the arrow out of the box labeled B points to.

For example:



What sequence of instructions (performed in order) changes the following starting picture to the following final picture?



A. $X \leq Y, Y \leq Z, Z \leq X$
B. $X \leq Z, Z \leq X, Y \leq H$
C. $Z \leq Y, X \leq Z, Y \leq H$
D. $Z \leq X, X \leq Y, Y \leq H$

Your Answer: | Correct Answer: D | Not Attempted | Time taken: 00min 00sec | Discuss

Q #9 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Quantitative Aptitude

If a, b, and c are real numbers, which of the following are necessarily true?

I. If $a < b$ and $ab \neq 0$, then $\frac{1}{a} > \frac{1}{b}$
II. If $a < b$, then $ac < bc$ for all c
III. If $a < b$, then $a + c < b + c$ for all c.
IV. If $a < b$. then $-a > -b$

A. I only
B. I and III only
C. III and IV only
D. I, III, and IV only

Your Answer: | Correct Answer: C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #10 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Quantitative Aptitude

Let n be any positive integer and $1 \leq x_1 < x_2 < \ldots < x_{n+1} \leq 2n$, where each x_i is an integer Which of the following must be true?

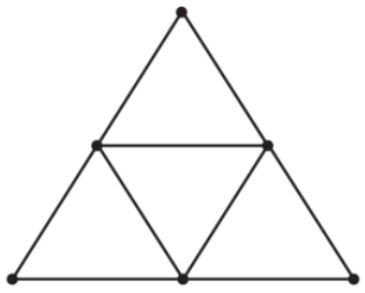
I. There is an x_i that is the square of an integer.
II. There is an i such that $x_{i+1} = x_i + 1$.
III. There is an x_i that is prime

A. I only
B. II only
C. I and II
D. I and III

Your Answer: | Correct Answer: B | Not Attempted | Time taken: 00min 00sec | Discuss

Technical

Q #1 | Numerical Type | Award: 1 | Penalty: 0 | Graph Theory



The figure above shows an undirected graph with six vertices. Enough edges are to be deleted from the graph in order to leave a spanning tree, which is a connected subgraph having the same six vertices and no cycles. How many edges must be deleted?

Your Answer: | Correct Answer: 4 | Not Attempted | Time taken: 00min 00sec | Discuss

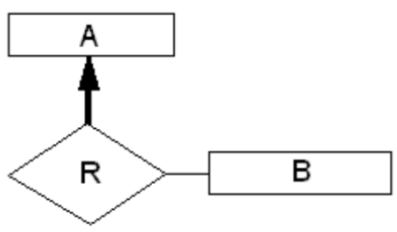
Q #2 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Set Theory & Algebra

Let $A - B$ denote $\{x \in A : x \notin B\}$. If $(A - B) \cup B = A$, which of the following must be true?

A. B is empty
B. $A \subseteq B$
C. $B \subseteq A$
D. $(B - A) \cup A = B$

Your Answer: | Correct Answer: C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #3 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Databases



Given the portion of an ER diagram shown above (with a thickened arrow from R to A), which of the following statements are true?

I. R connects each entity in A to at least one entity in B
II. R connects each entity in A to at most one entity in B
III. R connects each entity in B to at least one entity in A
IV. R connects each entity in B to at most one entity in A

A. only I and II
B. only II and III
C. only I and IV
D. only III and IV

Your Answer: | Correct Answer: C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #4 Multiple Select Type | Award: 1 | Penalty: 0 | CO and Architecture

Which kind of data dependence can cause data hazards in a single-core, pipelined, in-order processor? (Mark all that apply.)

A. read-after-write dependence
B. write-after-read dependence
C. write-after-write dependence
D. read-after-read dependence

Your Answer: | **Correct Answer: A** | Not Attempted | Time taken: 00min 00sec | Discuss

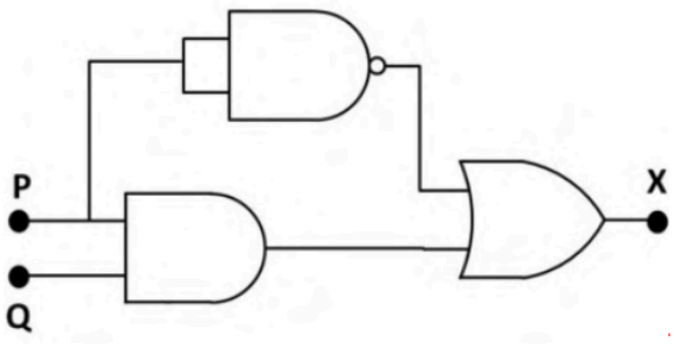
Q #5 Numerical Type | Award: 1 | Penalty: 0 | CO and Architecture

An MIPS pipeline has five stages, with a clock cycle of 200ps. Suppose that this MIPS pipeline is redesigned to have four stages, with a clock cycle of 250ps. Assuming an infinite sequence of instructions, what speedup will this new design achieve when compared to the five-stage pipeline?

Your Answer: | **Correct Answer: 0.8** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #6 Multiple Select Type | Award: 1 | Penalty: 0 | Digital Logic

Which one of the following options is CORRECT for the given logic circuit?



A. $P = 1, Q = 1; X = 0$
B. $P = 1, Q = 0; X = 1$
C. $P = 0, Q = 1; X = 0$
D. $P = 0, Q = 0; X = 1$

Your Answer: | **Correct Answer: D** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #7 Numerical Type | Award: 1 | Penalty: 0 | Digital Logic

Consider the bit pattern 10110110. Interpret this bit pattern as a 8-bit 2's complement number. What is the largest magnitude negative number that can be added to this value without causing 8-bit 2's complement overflow? (Write your answer in decimal, only the magnitude, not the sign)

Your Answer: | **Correct Answer: 54** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #8 Numerical Type | Award: 1 | Penalty: 0 | Set Theory & Algebra

If F is a function such that, for all positive integers x and y, $F(x, 1) = x + 1, F(1, y) = 2y$, and

$F(x+1, y+1) = F(F(x, y+1), y)$, then $F(2, 3) =$

Your Answer: | Correct Answer: 9 | Not Attempted | Time taken: 00min 00sec | Discuss

Q #9 | Multiple Select Type | Award: 1 | Penalty: 0 | Operating System

Consider three concurrently executing threads in the same process using two semaphores $\mathrm{s1}$ and $\mathrm{s2}$. Assume $\mathrm{s1}$ has been initialized to 1, while $\mathrm{s2}$ has been initialized to 0. What are the possible values of the global variable x, initialized to 0, after all three threads have terminated?

```
    /* thread A */
    P(s2);
    P(s1);
    x = x*2;
5.  V(s1);
```

```
    /* thread B */
    P(s1);
    x = x*x;
    V(s1);
```

```
    /* thread C */
    P(s1);
    x = x+3;
    V(s2);
5.  V(s1);
```

A. 6
B. 12
C. 18
D. 36

Your Answer: | Correct Answer: A;C;D | Not Attempted | Time taken: 00min 00sec | Discuss

Q #10 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Operating System

Suppose that pages are 512 B and each page table entry is 4 bytes. Assume that somehow the virtual and physical address spaces were both 4 GB and that the page table begins at address 0x10000000. If we wanted to access the virtual address 0x00000345, what is the address of the PTE we would look at?

A. 0x10000000
B. 0x10000001
C. 0x10000004
D. 0x10000345

Your Answer: | Correct Answer: C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #11 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Programming in C

Consider the following two blocks of code, found in separate files:

```c
/* main.c */
int main()
{
    int i=0;
    foo();
    return 0;
}
```

```c
/* foo.c */
int i=1;
void foo()
{
    printf(“%d”, i);
}
```

What will happen when you attempt to compile, link, and run this code?

A. It will fail to compile.
B. It will fail to link.
C. It will print " 0 ".
D. It will print " 1 ".

Your Answer: | Correct Answer: A | Not Attempted | Time taken: 00min 00sec | Discuss

Q #12 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Programming in C

What will the following print:

```c
int a, b, c, *d;
a = 0;
b = 1 ;
c = 2 ;
d = & a;
(*d) += b+c;
d = & b;
(*d) += a+b+c ;
printf("a= %i b=%i\n", a, b);
```

A. $a = 0, b = 3$
B. $a = 3, b = 3$
C. $a = 3, b = 4$
D. $a = 3, b = 7$

Your Answer: | Correct Answer: D | Not Attempted | Time taken: 00min 00sec | Discuss

Q #13 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Programming in C

What will be the output on the execution of the following code segment?

```c
main()
{
    unsigned num1=-1;
    signed num2=1;
    if(num1 < num2)
        printf("less");
    else if(num1>num2)
        printf("greater");
    else if(num1==num2)
        printf("equal");
}
```

A. greater

B. less
C. equal
D. error

Your Answer: | Correct Answer: A | Not Attempted | Time taken: 00min 00sec | Discuss

Q #14 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Algorithms

Here is an array of ten integers: 5389170264

Suppose we run MergeSort on this array. What is the number in the 7th position of the partially sorted array after the outermost two recursive calls have completed (i.e., just before the very last Merge step i.e. last line in the below pseudocode)?
(When we say "7th" position, we're counting positions starting at 1; for example, the input array has a "0" in its 7th position.)

```
MERGE-SORT(A, p, r)
1  if p ≥ r                          // zero or one element?
2      return
3  q = (p + r)/2                     // midpoint of A[p : r]
4  MERGE-SORT(A, p, q)               // recursively sort A[p : q]
5  MERGE-SORT(A, q + 1, r)           // recursively sort A[q + 1 : r]
6  // Merge A[p : q] and A[q + 1 : r] into A[p : r].
7  MERGE(A, p, q, r)
```

A. 3
B. 1
C. 2
D. 4

Your Answer: | Correct Answer: C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #15 | Multiple Select Type | Award: 1 | Penalty: 0 | Algorithms

A linear-probing hash table of length 10 uses the hash function $h(x) = x \bmod 10$. After inserting six integer keys into an initially empty hash table, the array of keys is:

0	1	2	3	4	5	6	7	8	9
		42	23	34	52	46	33		

Which of the following choice(s) are insertion sequences resulting in the above hash table? Assume that the length of the hash table does not change during the insertions. Check all that apply.

A. $34, 42, 23, 52, 33, 46$
B. $46, 34, 42, 23, 52, 33$
C. $42, 46, 33, 23, 34, 52$
D. $42, 23, 34, 52, 46, 33$

Your Answer: | Correct Answer: B;D | Not Attempted | Time taken: 00min 00sec | Discuss

Q #16 | Multiple Select Type | Award: 1 | Penalty: 0 | Compiler Design

A lexical analyzer uses the following patterns to recognize four tokens T1, T2, T3, and T4 over the alphabet $\{a, b, c\}$.

```
   Rule1:  aa*b*c* { print ("T1"); }
   Rule2:  c { print ("T2"); }
   Rule3:  c*b* { print ("T3"); }
   Rule4:  b { print ("T4"); }
5.
   Which of the following rules will never be used?
```

Note that the analyzer outputs the token that matches the longest possible prefix.

A. Rule1
B. Rule2
C. Rule3
D. Rule4

Your Answer: | Correct Answer: D | Not Attempted | Time taken: 00min 00sec | Discuss

Q #17 | Multiple Select Type | Award: 1 | Penalty: 0 | Compiler Design

Suppose there is a handle on the top of the stack at some point in time while performing $\mathrm{LR(k)}$ parsing. In this context, a cetrain $\mathrm{LR(k)}$ parsers may exhibit uncertainty in accurately identifying the handle, i.e., the parser may or may not recognize the handle correctly. Consequently, the parser can initiate one of the following actions:

A. The parser may generate a Shift-Reduce (SR) conflict.
B. The parser may generate a Reduce-Reduce (RR) conflict.
C. The parser may perform reduction without generating any conflict.
D. The parser may execute a shift operation without generating any conflict.

Your Answer: | Correct Answer: A;B;C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #18 | Numerical Type | Award: 1 | Penalty: 0 | Probability

Suppose that X and Y are independent random variables such that each is equal to 0 with probability $.5$ and 1 with probability $.5$. Find $P(X + Y \leq 1)$? (Answer up to 2 decimals)

Your Answer: | Correct Answer: 0.75 | Not Attempted | Time taken: 00min 00sec | Discuss

Q #19 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Probability

You have three coins in your pocket, two fair ones but the third biased with the probability of heads p and tails $1 - p$. One coin selected at random drops to the floor, landing heads up. How likely is it that it is one of the fair coins?

A. $1/\mathrm{p}$
B. $1/(1 + p)$
C. $p/(1 + p)$
D. $(1 + p)/p$

Your Answer: | Correct Answer: B | Not Attempted | Time taken: 00min 00sec | Discuss

Q #20 Numerical Type | Award: 1 | Penalty: 0 | Linear Algebra

Let A be a matrix defined as $A = uv^T$, where u and v are column vectors of dimension 3×1. The resulting matrix A will be of dimension 3×3. What are the maximum number of nonzero eigenvalues possible for the matrix A?

Your Answer: | **Correct Answer: 1** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #21 Multiple Choice Type | Award: 1 | Penalty: 0.33 | Calculus

If f, f', and f'' are continuous and $f(2) = 0, f'(2) = 2$, and $f''(2) = -3$, what can we say about the function $f(x)$ at $x = 2$?

A. f has a local minimum at $x = 2$.
B. f has a local maximum at $x = 2$.
C. f is increasing, at $x = 2$
D. f is decreasing, at $x = 2$

Your Answer: | **Correct Answer: C** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #22 Numerical Type | Award: 1 | Penalty: 0 | Computer Networks

On a wireless link, the probability of successfully sending a packet is 0.1. A stop-and-wait protocol is used to transfer data across the link. The channel condition is assumed to be independent of transmission to transmission. What is the expected number of packets that experience timeout to send one packet? (Timeout occurs on unsuccessful transmission)

Your Answer: | **Correct Answer: 9** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #23 Multiple Choice Type | Award: 1 | Penalty: 0.33 | Computer Networks

The "two-out-of-five" code comprises all possible binary words of length 5 containing exactly two 1's. Which of the following statements is correct regarding error detection or correction for the "two-out-of-five" code?

A. The code can detect up to 3 bits of error and correct 1 bit of error.
B. The code can detect up to 2 bits of error and correct 1 bit of error.
C. The code can detect up to 1 bit of error and cannot correct errors.
D. The code cannot detect or correct any errors.

Your Answer: | **Correct Answer: C** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #24 Multiple Choice Type | Award: 1 | Penalty: 0.33 | CO and Architecture

Which of the following is the best justification for using the middle bits of an address as the set index into a cache rather than the most significant bits?

A. Indexing with the most significant bits would necessitate a smaller cache than is possible with middle-bit indexing, resulting in generally worse cache performance.
B. It is impossible to design a system that uses the most significant bits of an address as the set index.
C. The process of determining whether a cache access will result in a hit or a miss is faster using middle-bit indexing.

D. A program with good spatial locality is likely to make more efficient use of the cache with middle-bit indexing than with high-bit indexing.

Your Answer: | **Correct Answer: D** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #25 Multiple Select Type | Award: 1 | Penalty: 0 | Theory of Computation

Which one of the following context-free grammars is *unambiguous*? (Note that $a, b, c, (,), +$ are terminals, S, X, Y are nonterminals, and the start symbol in each case is S.)

A. $S \rightarrow aX \mid Yc, X \rightarrow bc, Y \rightarrow ab$
B. $S \rightarrow \epsilon|()|(S)$
C. $S \rightarrow \epsilon|(S)|SS$
D. $S \rightarrow \epsilon|(S)|S$

Your Answer: | **Correct Answer: N/A** | Marks To All | Time taken: 00min 00sec | Discuss

Q #26 Multiple Select Type | Award: 2 | Penalty: 0 | Linear Algebra

Consider the system $A\mathbf{x} = \mathbf{b}$, with coefficient matrix A and augmented matrix $[A \mid b]$. The sizes of $\mathbf{b}$, A, and $[A \mid \mathbf{b}]$ are $m \times 1, m \times n$, and $m \times (n+1)$, respectively; in addition, the number of unknowns is n.

Which of the following is/are TRUE?

A. $A\mathbf{x} = \mathbf{b}$ is inconsistent (i.e., no solution exists) if and only if $\text{rank}[A] < \text{rank}[A \mid b]$.
B. $A\mathbf{x} = \mathbf{b}$ has a unique solution if and only if $\text{rank}[A] = \text{rank}[A \mid b] = n$.
C. $A\mathbf{x} = \mathbf{b}$ has infinitely many solutions if and only if $\text{rank}[A] = \text{rank}[A \mid b]$
D. $A\mathbf{x} = \mathbf{b}$ is inconsistent (i.e., no solution exists) if and only if $\text{rank}[A] > \text{rank}[A \mid b]$.

Your Answer: | **Correct Answer: A;B** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #27 Multiple Choice Type | Award: 2 | Penalty: 0.67 | Set Theory & Algebra

If b and c are elements in a group G, and if $b^5 = c^3 = e$, where e is the unit element of G, then the inverse of $b^2cb^4c^2$ must be

A. $b^4c^2b^2c$
B. $c^2b^4cb^2$
C. $cb^2c^2b^4$
D. cbc^2b^3

Your Answer: | **Correct Answer: D** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #28 Multiple Select Type | Award: 2 | Penalty: 0 | Set Theory & Algebra

A binary relation R over a set A is called a "GO Relation" if for all $\mathrm{x}, \mathrm{y}, \mathrm{z} \in A$, if xRy and xRz, then yRz.

Which of the following is/are true about a relation R?

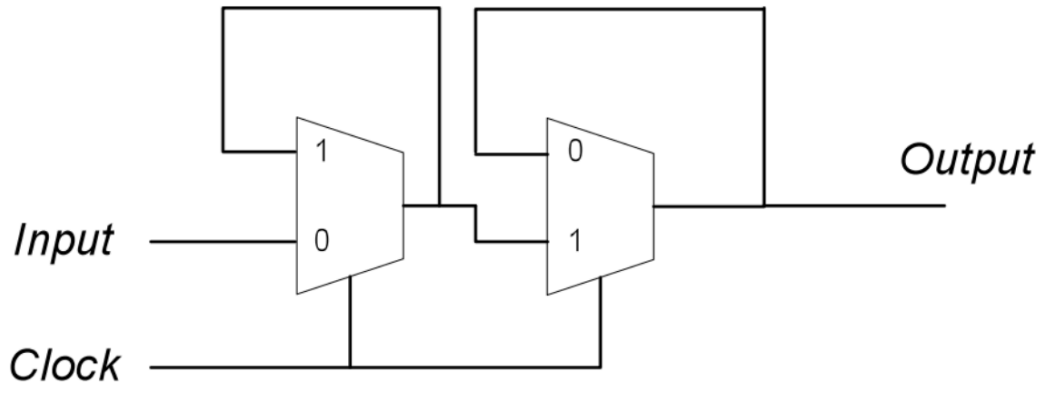
A. If R is a reflexive and GO relation then R is symmetric.
B. If R is a reflexive and GO relation then R is transitive.

C. If R is a GO relation then R is reflexive.
D. If R is an equivalence relation then R is a GO relation.

Your Answer: | **Correct Answer: A;B;D** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #29 Multiple Choice Type | Award: 2 | Penalty: 0.67 | Digital Logic

The circuit shown below is designed using two multiplexers.



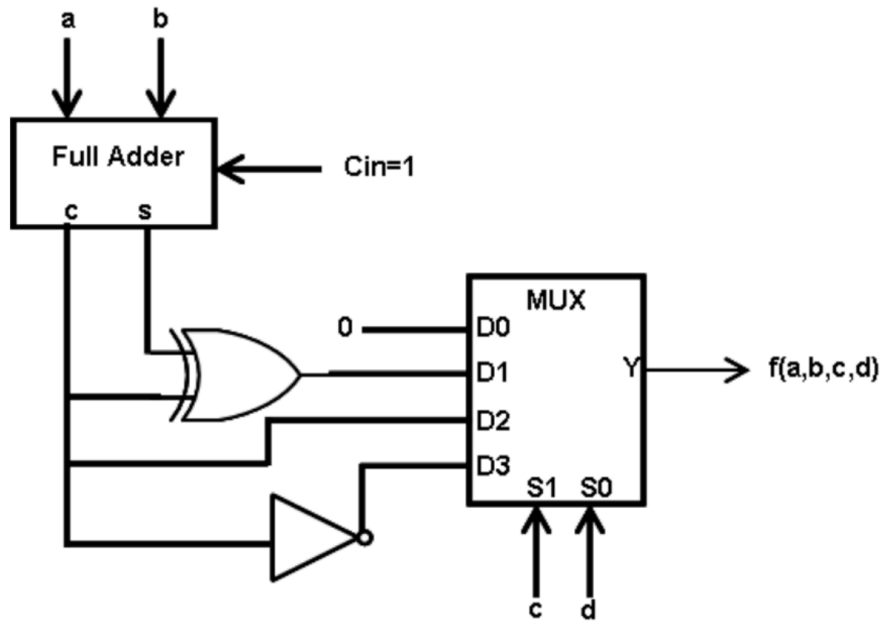
This circuit is equivalent to:

A. a positive edge triggered T flip flop
B. a negative edge triggered T flip flop
C. a negative edge triggered D flip flop
D. a positive edge triggered D flip flop

Your Answer: | **Correct Answer: D** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #30 Multiple Choice Type | Award: 2 | Penalty: 0.67 | Digital Logic

What is the output, $f(a, b, c, d)$, for the following circuit?



A. $\Sigma(1, 3, 6, 13, 14, 15)$
B. $\Sigma(1, 3, 6, 9, 10, 14)$
C. $\Sigma(1, 3, 5, 6, 9, 10, 14)$
D. $\Sigma(1, 3, 5, 6, 9, 10, 12)$

Your Answer: | **Correct Answer: C** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #31 Multiple Select Type | Award: 2 | Penalty: 0 | Digital Logic

A self-dual logic function is a function that is identical to its dual. An anti-self-dual logic function is a function whose dual is the same as the complement of the function.

A boolean function f on n variables is called neutral if f has value 1 for 2^{n-1} of 2^n possible input combinations and has value 0 for the other 2^{n-1} input combinations.

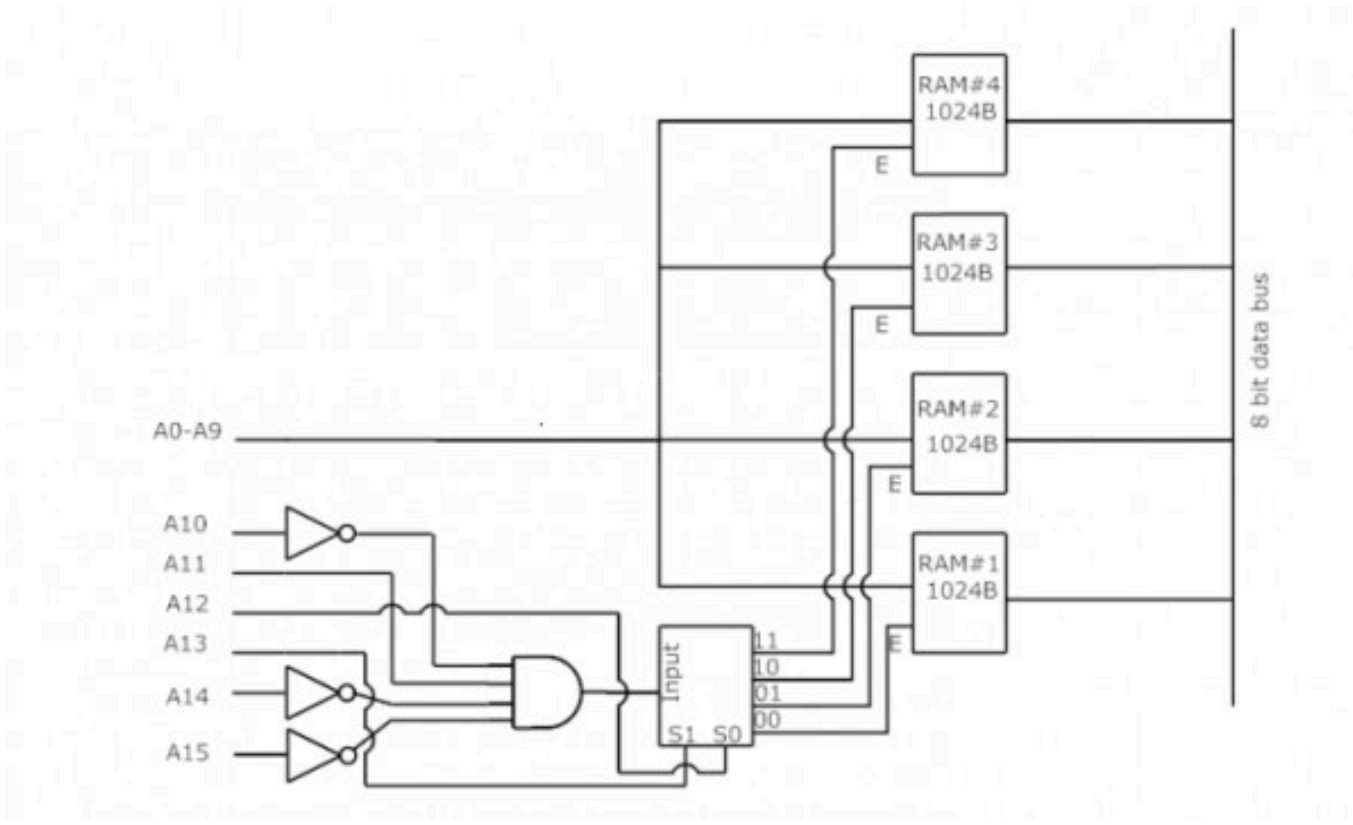
Which of the following is/are true for boolean functions on n variables?

A. Every self-dual function is neutral.
B. Every anti-self-dual function is neutral.
C. The number of anti-self-dual functions on n variables is $C\left(2^{n-1}, 2^{n-2}\right)$.
D. The number of self-dual functions on n variables is $\mathrm{C}\left(2^{n-1}, 2^{n-2}\right)$.

Your Answer: | **Correct Answer: A** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #32 Multiple Choice Type | Award: 2 | Penalty: 0.67 | CO and Architecture

There are four chips each of 1024 bytes connected to a 16 bit address bus as shown in the figure below. RAMs $1, 2, 3$ and 4 respectively are mapped to addresses



A. 0C00H-0FFFH, 1C00H-1FFFH, 2C00H-2FFFH, 3C00H-3FFFH
B. 1800H-1FFFH, 2800H-2FFFH, 3800H-3FFFH, 4800H-4FFFH
C. 0500H-08FFH, 1500H-18FFH, 3500H-38FFH, 5500H-58FFH
D. 0800H-0BFFH, 1800H-1BFFH, 2800H-2BFFH, 3800H-3BFFH

Your Answer: | **Correct Answer: D** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #33 Numerical Type | Award: 2 | Penalty: 0 | CO and Architecture

Consider the following 6 $\mathrm{I/O}$ operations and their respective cylinder locations on disk. Seek time is 0.1 milliseconds per cylinder traversed. The cylinders are numbered from 0 to 99.

Operation	A	B	C	D	E	F
Cylinder	4	10	35	62	69	95

We use the Shortest Seek Time First disk scheduling algorithm to schedule these operations. The arm begins at cylinder 33. The total seek time comes out to be X milliseconds (Ignore rotational and transfer delays). Unhappy with this seek time, we decide to use LOOK as our disk scheduling algorithm instead. Assume LOOK begins by traversing descending cylinder numbers starting with the disk arm at cylinder 33. The total time we spend seeking is Y milliseconds. What is $10 * (\mathrm{X} - \mathrm{Y})$?

Your Answer: | Correct Answer: 4 | Not Attempted | Time taken: 00min 00sec | Discuss

Q #34 Numerical Type | Award: 2 | Penalty: 0 | Combinatory

Acceptable input for a certain pocket calculator is a finite sequence of characters each of which is either a digit or a sign. The first character must be a digit, the last character must be a digit, and any character that is a sign must be followed by a digit. There are 10 possible digits and 4 possible signs If N_k denotes the number of such acceptable sequences having length k, then N_k is given recursively by $N_k = aN_{k-1} + bN_{k-2}$, for $k \geq 3$. What is $a + b$?

Your Answer: | Correct Answer: 50 | Not Attempted | Time taken: 00min 00sec | Discuss

Q #35 Multiple Select Type | Award: 2 | Penalty: 0 | Operating System

Consider the scenario where L is a shared variable which is a pointer to the head of a linked list originally containing three nodes with keys $3, 4$, and 5. Consider the function List_Insert() which is being used by two concurrent threads $\mathrm{T1}$ and $\mathrm{T2}$ of the single process.

Assume that thread $\mathrm{T1}$ invokes $\mathrm{List\_Insert}(2)$, and concurrently, thread $\mathrm{T2}$ invokes $\mathrm{List\_Insert}(\ 6)$.

```
    typedef struct node {
        int key;
        struct node *next;
    } node_t;
 5.
    void List_Insert( int key) {
    node_t *new = malloc(sizeof(node_t));
    new->key = key;
    new->next = L;
10. L= new;
    }
```

Assuming the successful execution of malloc(), and considering the linked list is shared between two processes, what could be the outcomes of the final linked list?

In each option, the linked list is represented as a sequence of numbers, where the leftmost number signifies the key of the head of the linked list, and elements are separated by commas.

A. $6, 3, 4, 5$
B. $6, 2, 3, 4, 5$
C. $2, 6, 3, 4, 5$
D. $2, 3, 4, 5$

Your Answer: | Correct Answer: A;B;C;D | Not Attempted | Time taken: 00min 00sec | Discuss

Q #36 Numerical Type | Award: 2 | Penalty: 0 | Operating System

The following table lists the arrival time and execution time of 5 threads.

Job	Arrival time	Execution time
A	0	45
B	19	15
C	40	30
D	79	50
E	89	30

Consider Round-Robin with a time quantum of 20 units. If the Gantt chart starts at zero, what is the time at which E finishes its execution?

Your Answer: | **Correct Answer: 160** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #37 Multiple Choice Type | Award: 2 | Penalty: 0.67 | Programming in C

What will be the output of the following program?

```
#include<stdio.h>
void swap(char **s1, char **s2){
    char *tmp;
    tmp=*s1;
    *s1=*s2;
    *s2=tmp;
}
int main()
{
    char *str[3]= {"orange", "apple", "pear"};
    for (int i = 0; i<2; i++)
        swap(&strs[i], &strs[i+1]);
    printf("%s %s %s", strs[0], strs[1], strs[2]);
}
```

A. pear apple orange
B. apple pear orange
C. orange apple pear
D. apple orange pea

Your Answer: | **Correct Answer: B** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #38 Numerical Type | Award: 2 | Penalty: 0 | Programming in C

Consider the following pair of mutually recursive functions. What does $g(g(2))$ evaluate to?

```
int f(int n){
    if (n==0) return 0;
    return f(n-1)+g(n-1);
}
int g(int n){
    if (n==0) return 1;
    return g(n-1) + f(n);
}
```

Your Answer: | **Correct Answer: 89** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #39 Multiple Choice Type | Award: 2 | Penalty: 0.67 | Algorithms

An inversion in an array a is a pair of array indices (i, j) such that $i < j$ but $a[i] > a[j]$.

What is the maximum number of inversions that can be eliminated by the following program fragment?

```
tmp = a[5] ;
a[5] = a[10] ;
a[10]= tmp ;
```

A. 5

B. 6
C. 9
D. 20

Your Answer: | Correct Answer: C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #40 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Algorithms

Given an unsorted array of n distinct elements, you want to find this set of $\log n$ elements: those at positions $1, 2, 4, 8, 16, \ldots, n/2$ if array were sorted. In other words, find the largest element, the second largest element, the fourth largest element, the eighth largest element and so on, terminating with the median element.
Consider that we have an algorithm to find kth smallest in an array of size n using $\theta(n)$ time. Assume n is a power of 2. How fast can you find all these $\log n$ elements? (Hint: Similar to binary search, we never have to worry about one of the subarray)

A. $\Theta(\log n)$
B. $\Theta(n)$
C. $\Theta(n \log n)$
D. $\Theta\left(n^2\right)$

Your Answer: | Correct Answer: B | Not Attempted | Time taken: 00min 00sec | Discuss

Q #41 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Algorithms

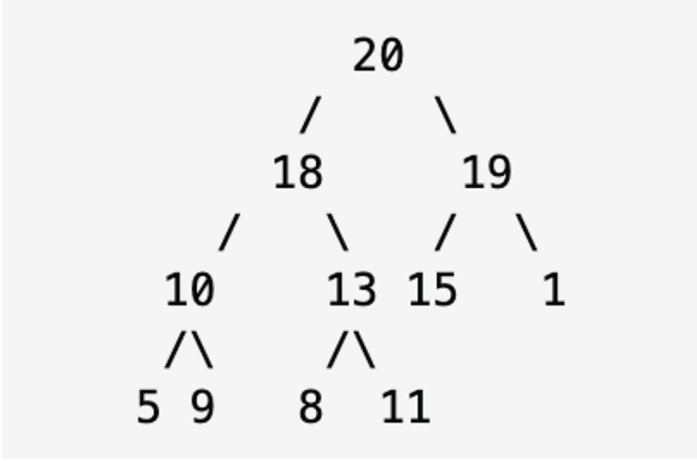
Consider a directed graph G with a source vertex s, a destination t, and nonnegative edge lengths. Under what conditions is the shortest $s - t$ path guaranteed to be unique?

A. When all edge lengths are distinct positive integers.
B. When all edges lengths are distinct positive integers and the graph G contains no directed cycles.
C. When all edge lengths are distinct powers of 2.
D. None of the other options are correct.

Your Answer: | Correct Answer: C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #42 | Multiple Select Type | Award: 2 | Penalty: 0 | DS

Consider the following binary heap –



Suppose the last operation you performed in the binary heap above was inserting the key x.

What are the possible values of x?

A. 20

B. 8
C. 13
D. 11

Your Answer: | Correct Answer: C;D | Not Attempted | Time taken: 00min 00sec | Discuss

Q #43 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | DS

Consider the linked list initially having values $1, 2, 2, 8, 6, 2, 2$, and let the head be the pointer to the first node of the linked list.
Which of the following options correctly represents the final linked list after the function call mystery(head, 2)?

```
    typedef struct node {
        int value;
        struct node *next;
    } Node;
5.  Node* mystery(Node* head, int x) {
        if (head == NULL)
            return NULL;

        if (head → value == x) {
10.         Node* tmp = head → next;
            free(head);
            return tmp;
        } else {
            head → next = mystery(head → next, x);
15.         return head;
        }
    }
```

A. Final LinkedList will be $1, 2, 8, 6, 2, 2$
B. Final LinkedList will be $1, 8, 6$
C. Final LinkedList will be $1, 8, 6, 2, 2$
D. None of the above

Your Answer: | Correct Answer: A | Not Attempted | Time taken: 00min 00sec | Discuss

Q #44 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Compiler Design

Consider the following grammar given below.

$$A \to B + A$$
$$A \to B$$
$$B \to CB$$
$$B \to C$$
$$C \to D^*$$
$$C \to D$$
$$D \to (A)$$
$$D \to a \mid b$$

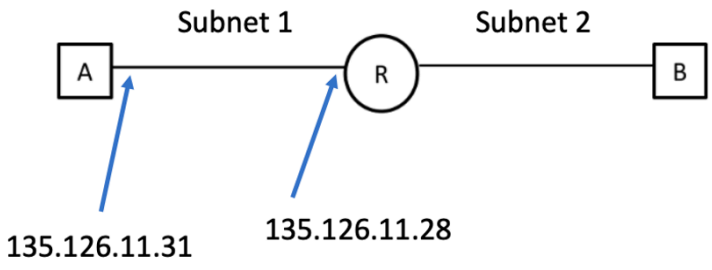
What will be the content of the stack of SLR parser immediately after shifting the last character of the string: $a^*b($

A. $\mathrm{CC}($
B. $\mathrm{BC}($
C. CB
D. BB

Your Answer: | Correct Answer: A | Not Attempted | Time taken: 00min 00sec | Discuss

Q #45 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Computer Networks

Consider two hosts A and B, connected to router R, creating two subnets: Subnet 1 and Subnet 2, as shown in the figure. The interface IPs of Subnet 1 are also depicted in the given diagram.



Assume that, for every subnet, the all-zeros address is reserved for the network name, and the all-ones address is reserved for broadcast. The network administrator wants to establish a subnet mask for Subnet 1 so that the network prefix has maximal length.

What should be the maximal length subnet mask for Subnet 1?

A. $125.126.11.0/26$
B. $125.126.11.16/27$
C. $125.126.11.16/28$
D. $125.126.11.28/30$

Your Answer: | Correct Answer: A | Not Attempted | Time taken: 00min 00sec | Discuss

Q #46 | Numerical Type | Award: 2 | Penalty: 0 | Computer Networks

Host A has to 'inject' 30 Mbits of data into a network via a token bucket regulator. The token bucket has a capacity of 15 Mbits and is filled with tokens at the rate of 5 Mbps. Data is buffered if it arrives at the regulator when there are no tokens in the bucket. How long does it take (in seconds), in total, for the 30 Mbits of data to enter the network, assuming that the host sends at a peak rate of 20 Mbps and the token bucket is initially full?

Your Answer: | Correct Answer: 3 | Not Attempted | Time taken: 00min 00sec | Discuss

Q #47 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Databases

You are given a table named Alums that contains the names and personal information of all graduates of the college that you work for. It includes name and age attributes, and a state attribute specifying the state in which a person resides.

Consider the following SQL queries:

Query I

```
SELECT name, MIN(age)
FROM Alums
WHERE state = “CA”;
```

Query II

```
    SELECT name, age
    FROM Alums
    WHERE state = “CA”
            AND age <= ALL (SELECT age FROM Alums
5.                          WHERE state = “CA”);
```

Query III

```
    SELECT name, age
    FROM Alums
    WHERE state = “CA”
            AND age = (SELECT  MIN(age) FROM Alums);
```

Which of these queries would successfully find the name and age of the youngest graduate living in California (CA)?

A. only II
B. only III
C. only I and II
D. only II and III

Your Answer: | Correct Answer: A | Not Attempted | Time taken: 00min 00sec | Discuss

Q #48 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Databases

Consider the following notation for operations of transactions:

$$\begin{array}{ll} w_1(A) & \text{transaction 1 wrote item } A \\ r_1(A) & \text{transaction 1 read item } A \\ c_1 & \text{transaction 1 commits} \end{array}$$

Consider the following schedules:

$$S_1 = r_1(C), w_1(C), r_1(A), w_1(A), r_2(B), r_2(A), w_2(B), c_2, w_1(C), c_1$$
$$S_2 = w_1(A), r_1(B), r_3(B), w_2(A), r_2(B), w_1(C), c_1, w_3(B), c_2, c_3$$
$$S_3 = r_1(A), w_1(A), r_2(A), w_2(A), r_3(A), w_3(A), r_2(B), w_2(B), c_2, r_1(B), w_1(B), c_1, c_3$$

Which of the above schedules is/are recoverable?

A. Only S_2
B. Only S_3
C. Only $\mathrm{S}_1, \mathrm{S}_3$
D. None

Your Answer: | Correct Answer: A | Not Attempted | Time taken: 00min 00sec | Discuss

Q #49 | Multiple Select Type | Award: 2 | Penalty: 0 | Databases

Which of the following statements is/are false?

A. In a cascade-less schedule if a transaction T_j read a data item written by transaction T_i then the commit of T_i has to be before this read operation of T_j
B. A recoverable schedule is also cascade-less
C. Not all conflict-serializable schedules are also 2PL
D. A schedule that is $2\mathrm{PL}$ (could have been produced using the $2\mathrm{PL}$ locking protocol) is conflict-serializable.

Your Answer: | Correct Answer: B | Not Attempted | Time taken: 00min 00sec | Discuss

Q #50 | Multiple Select Type | Award: 2 | Penalty: 0 | Databases

In a relational database relation, we say a non-empty set of attributes X is closed (with respect to a given set of functional dependencies FD) if $X^{+}=X$ (where $X^{+}$is the closure of X). Consider a relation with schema $\mathrm{R}\{\mathrm{A}, \mathrm{B}, \mathrm{C}, \mathrm{D})$ and an unknown set of FD's.

If we are told which sets of attributes are closed, we can discover the FD's.

Assume that the only closed sets are $\{\mathrm{A}, \mathrm{B}\}, \{\mathrm{A}, \mathrm{B}, \mathrm{C}, \mathrm{D}\}$.

Which of the following is/are true for R?

A. The number of candidate keys is 2.
B. The number of non-prime attributes is 2.
C. R is in $2NF$.
D. R is in $3NF$.

Your Answer: | Correct Answer: A;B;C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #51 | Multiple Select Type | Award: 2 | Penalty: 0 | Theory of Computation

Which of the following is/are undecidable?

A. $L=\{\langle M\rangle \mid M$ is a TM, $\mathrm{L}(M) \neq \emptyset$, and $\mathrm{L}(M) \neq \Sigma^{*}\}$.
B. $\{\langle M\rangle \mid M$ is a TM and $\mathrm{L}(M)=\varnothing\}$
C. $\mathrm{L}=\{\langle \mathrm{M}>|\mathrm{M}$ is a TM and $\mathrm{L}(\mathrm{M})$ is uncountable $\}$
D. $L=\{\langle M\rangle \mid M$ is a DFA and $L(M)$ is uncountable $\}$

Your Answer: | Correct Answer: A;B | Not Attempted | Time taken: 00min 00sec | Discuss

Q #52 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Theory of Computation

Below you see the transition table of a finite state automaton. The initial state is 0; the final state is 4. $\emptyset$ denotes the fail state, where no successful transition is possible for the given symbol. Note that when encountering a b in state 2, two transitions are possible: we can either stay in state 2 or move on to state 3.

	Input		
State	a	b	c
0	1	$\emptyset$	$\emptyset$
1	$\emptyset$	2	$\emptyset$
2	$\emptyset$	2, 3	$\emptyset$
3	$\emptyset$	$\emptyset$	4
4:	$\emptyset$	$\emptyset$	3

Which of the following regular expressions matches the FSA? (The regular expression has to match exactly the same set of strings that is accepted by the FSA: not more, not less.)

A. $\mathrm{abb}^{+}\mathrm{c}(\mathrm{cc})^{*}$
B. $\mathrm{abbb}^{*}\mathrm{c}^{+}$
C. $\mathrm{abbb}^{+}\mathrm{c}^{+}\mathrm{c}$
D. $ab^{*}bb(cc)^{+}$

Your Answer: | Correct Answer: A | Not Attempted | Time taken: 00min 00sec | Discuss

Q #53 Multiple Choice Type | Award: 2 | Penalty: 0.67 | Theory of Computation

This question concerns two languages over the alphabet $\Sigma = \{1, -1\}$ (note that this is an alphabet with just two symbols: 1 and -1). The two symbols are interpreted, in the natural way, as the numbers 1 and -1, in order to define the languages, which are:

- $L_1 = \{x \in \Sigma^* \mid$ the sum of the numbers in x is divisible by $3\}$
- $L_2 = \{x \in \Sigma^* \mid$ the sum of the numbers in x is $0\}$.

Thus, for example, the first two words below are in both L_1 and L_2, whereas the third and fourth are in L_1 but not in L_2.

$$\epsilon \qquad 1\ 1\ -1\ 1\ -1\ -1 \qquad 1\ 1\ -1\ 1\ 1\ -1\ 1 \qquad -1\ -1\ -1\ -1\ 1\ 1$$

Which of the above languages is/are regular?

A. Only L_1
B. Only L_2
C. Both
D. None

Your Answer: | Correct Answer: A | Not Attempted | Time taken: 00min 00sec | Discuss

Q #54 Multiple Select Type | Award: 2 | Penalty: 0 | Theory of Computation

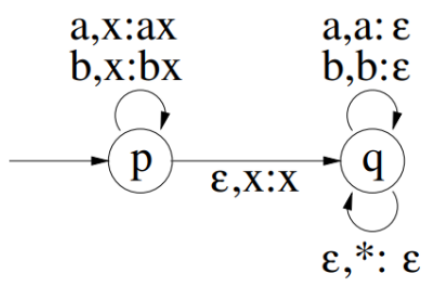
Which of the following statements about Turing machines is false?

A. For every context-sensitive language L, there is a Turing machine that accepts precisely the strings of L.
B. For any grammar G with set of terminals Σ, there is a Turing machine that accepts precisely the strings in Σ^* that cannot be derived from G.
C. There is a Turing machine which, given encodings of two DFAs over the same alphabet Σ, can tell whether or not they define the same language.
D. There is a Turing machine A which can simulate the behaviour of any given Turing machine B on any given finite input.

Your Answer: | Correct Answer: B | Not Attempted | Time taken: 00min 00sec | Discuss

Q #55 Numerical Type | Award: 2 | Penalty: 0 | Theory of Computation

Consider the following non-deterministic pushdown automaton. The input alphabet is $\{a, b\}$, the stack alphabet is $\{*, a, b\}$, and the initial stack symbol is $*$. Acceptance is by empty stack. We use x as a variable that ranges over the stack alphabet, so that for instance $a, x : ax$ actually stands for the three transitions $a, * : a*$ and $a, a : aa$ and $a, b : ab$.



How many strings of length 12 are accepted by this NPDA?

Your Answer: **Correct Answer: 64** Not Attempted Time taken: 00min 00sec Discuss