Information Technology University, Lahore.

ENTRANCE SAMPLE TEST

Program: MSCS/MSDS/PhD-CS

Mark the correct choice in the provided answer sheet

1. How many relations are there on a set with n elements that are symmetric and a set with n elements that are reflexive and symmetric?
(A) 2n(n + 1)/2 and 2n.3n(n−1)/2
(B) 3n(n−1)/2 and 2n(n−1)
(C) 2n(n + 1)/2 and 3n(n−1)/2
(D) n^2

2. Which of the following is not a correct statement about a probability?
(A) It must have a value between 0 and 1
(B) It can be reported as a decimal or a fraction
(C) A value near 0 means that the event is not likely to occur/happens
(D) It is the collection of several experiments.

3. The recurrence T (n) = 2T (n/2) + n is equivalent to:
(A) O(n)
(B) O(n log n)
(C) O(n2)
(D) O(n!)

4. What will be output if you will execute the c code shown below?
(A) Equal
(B) NOT Equal
(C) Null
(D) Compilation error

```c
#include<stdio.h>
int main(){
    int a=0;
    #if (a==0)
        printf("Equal");
    #else if
        printf("Not equal");
    #endif
    return 0;
}
```

5. What is the maximum size of byte-addressable memory that could be accessed using a 32 bit address bus?
(A) 32 bytes
(B) 32 Kilobytes
(C) 4 Megabytes
(D) 4 Gigabytes

6. Let a deterministic TM M decides a language in f(n) steps. Then the maximum space M is:
(A) at most (f(n))2
(B) at least 2 ∗ f(n)
(C) at most 2f(n)
(D) at most f(n)

7. There are, as yet, no vegetation types or ecosystems whose study has been to the extent that they no longer _ _ _ _ ecologists.
(A) perfected ... hinder
(B) exhausted ... interest
(C) prolonged ... require
(D) prevented ... challenge

Directions: Each passage in this group is followed by questions based on its content. After reading a passage, choose the best answer to each question. Answer all questions following a passage on the basis of what is stated or implied in that passage.

(This passage is excerpted from an article that was published in 1982.)

Warm-blooded animals have elaborate physiological controls to maintain constant body temperature (in humans, 37∘ C). Why then during sickness should temperature rise, apparently increasing stress on the infected organism? It has long been known that the level of serum iron in animals falls during infection. Garibaldi first suggested a relationship between fever and iron. He found that microbial synthesis of siderophoressubstances that bind ironin bacteria of the genus Salmonella declined at environmental temperatures above 37∘ C and stopped at 40.3∘ C. Thus, fever would make it more difficult for an in- fecting bacterium to acquire iron and thus to multiply. Cold-blooded animals were used to test this hypothesis because their body temper- ature can be controlled in the laboratory. Kluger reported that of iguanas infected with the potentially lethal bacterium A. hydrophilia, more survived at temperatures of 42∘ C than at 37 ∘ C, even though healthy animals prefer the lower temperature. When animals at 42∘ C were injected with an iron solution, however, mortality rates increased significantly. Research to determine whether similar phenomena occur in warm-blooded animals is sorely needed.

8. The passage is primarily concerned with attempts to determine
(A) the role of siderophores in the synthesis of serum iron
(B) new treatments for infections that are caused by A. hydrophilia
(C) the function of fever in warm-blooded animals
(D) the mechanisms that ensure constant body temperature

In a game, exactly six inverted cups stand side by side in a straight line, and each has exactly one ball hidden under it. The cups are numbered consecutively 1 through 6. Each of the balls is painted a single solid color. The colors of the balls are green, magenta, orange, purple, red, and yellow. The balls have been hidden under the cups in a manner that conforms to the following conditions:

- The purple ball must be hidden under a lower-numbered cup than the orange ball.
- The red ball must be hidden under a cup immediately adjacent to the cup under which the magenta ball is hidden.
- The green ball must be hidden under cup 5.

9. Which of the following could be the colors of the balls under the cups, in order from 1 through 6?
(A) Green, yellow, magenta, red, purple, orange
(B) Magenta, green, purple, red, orange, yellow
(C) Magenta, red, purple, yellow, green, orange
(D) Orange, yellow, red, magenta, green, purple