

Programming Methodology (I.M.Tech.) - Assignment

1. Search the Internet and find out the difference between the following two declarations, understand and write in your own words.

```
char *strstr(const char *s1, const char *s2);  
int f1(char* const s);
```

2. What is the meaning and use of a *register* variable?
3. Using *typedef* create a new data type called `uint1024_t` where the new type has a 1024 bit unsigned integer value. Such values are typically used in cryptography to store 1024-bit keys.
4. Go through this URL: <http://c-faq.com/stdio/scanfprobs.html>, run the programs given there and understand the problems with `scanf`. Write a summary of what you have learnt.
5. What will happen when the following code fragment is executed, assuming that the file is successfully opened? Run this in a simple program and explain your observation clearly.

```
#define MAXLEN 256  
char *line;  
FILE *fp;  
  
fp = fopen("test.txt", "r");  
while (fgets(line, MAXLEN, fp) != NULL) {  
    printf("Line: %s\n", line);  
}
```

6. Which of the statements below is valid? Explain your answer. Correct the statements as necessary. What is the difference between "A" and 'A'?

```
char *B = A;  
char *B = "A";  
char *B = 'A';
```

7. What is the initial value of a global variable? What about local variables?
8. Is the following statement an infinite loop? Why?

```
while (x = 10)  
    printf("In while loop\n");
```

9. Given the following program, run this program, observe the output and explain the reason for the output you are seeing.

```
#define MAX 32

void printString(char *str)
{
    int i;

    for (i = 0; *str != '\0'; i++) {
        printf("%c", *str++);
        printf("%c", str[i]);
    }

    return;
}

int main(void)
{
    char str[MAX]="Hello World";

    printString(str);
    exit(0);
}
```

10. Given the following expression, parenthesize it fully to show the order of evaluation, given that p is a pointer to an integer, s is a pointer to a structure and num is an integer field within the structure.

```
val = *++p || *s && *s->num;
```

11. The function process has the prototype below. Does passing an array of a million elements to the process function take longer time than passing an array of two elements? Briefly explain. Answers without explanation receive no marks.

```
int process(int data[], int size);
```

12. Explain the purpose of the first statement and then the prototype of the function given below: what do the parameters of the function and return value represent and whether you can state if something is an input, output or I/O parameter based purely on the prototype.

```
typedef void (*sighandler_t)(int);
sighandler_t signal(int signum, sighandler_t handler);
```