Lab 1 – Basic C Programming and Control Flow – Suggested Answers

Q1: Suggested Answer

```c
#include <stdio.h>
int main()
{
  int studentNumber = 0, mark;

  printf("Enter Student ID: \n");
  scanf("%d", &studentNumber);
  while (studentNumber != -1)
  {
    printf("Enter Mark: \n");
    scanf("%d", &mark);
    switch ((mark+5) / 10) {
      case 10:
      case  9:
      case  8: printf("Grade = %c\n", 'A');
        break;
      case  7: printf("Grade = %c\n", 'B');
        break;
      case  6: printf("Grade = %c\n", 'C');
        break;
      case  5: printf("Grade = %c\n", 'D');
        break;
      default: printf("Grade = %c\n", 'F');
    }
    printf("Enter Student ID: \n");
    scanf("%d", &studentNumber);
  }
  return 0;
}
```

Q2: Suggested Answer

```c
#include <stdio.h>
int main()
{
  int total, count, lines, input;
  double average;
  int i;

  printf("Enter number of lines: \n");
  scanf("%d", &lines);
  for (i = 0; i < lines; i++) {
    total=0; count=0;
    printf("Enter line %d (end with -1): \n", i+1);
    scanf("%d", &input);
    while (input != -1)
    {
```

```c
        total += input;
        count++;
        scanf("%d", &input);
      }
      average = (double)total/(double)count;
      printf("Average = %.2f\n", average);
    }
  return 0;
}
```

Q3: Suggested Answer

```c
#include <stdio.h>
int main()
{
  int row, col, height;
  int num = 0;

  printf("Enter the height: \n");
  scanf("%d", &height);
  printf("Pattern: \n");
  for (row = 0; row < height; row++)
  {
    for (col = 0; col < row+1; col++)     // print numbers
      printf("%d",num+1);
    num = (num + 1) % 3;          // print up to number 3
    printf("\n");
  }
  return 0;
}
```

Q4: Suggested Answer

```c
#include <stdio.h>
int main()
{
  int n, denominator = 1;
  float x, result = 1.0, numerator = 1.0;

  printf("Enter x: \n");
  scanf("%f", &x);
  for (n = 1; n <= 10; n++)
  {
    denominator *= n;
    numerator *= x;
    result += numerator/denominator;
  }
  printf("Result = %.2f\n",  result);
  return 0;
}
```