



**Department of Computing and Software**  
**COMPCS 2S03 (Principles of Programming)**  
**MIDTERM TEST 3**

**Student Number:** \_\_\_\_\_  
**Name:** \_\_\_\_\_ (*first-name last-name*)

**Instructor: Dr. Afraz Syed**  
**Duration: 50 minutes**

**November 20, 2018**  
**Total marks: 30**

**Instructions:** This is a closed book exam. No reference material, calculators or other electronic devices are permitted. Answer all questions on the Answer Sheet. Number of pages = 6.

**Section 1 (Marks 15)**

**Q1:** Write C programming statements for each of the following descriptions: **(Marks 10)**

- |   |
|---|
| 1. Print 1234 right justified in a 10-digit field.  |
| 2. Print 123.456789 in exponential notation with a sign (+ or -) and 3 digits of precision. |
| 3. Read a double value into variable number.  |
| 4. Print 100 in octal form preceded by 0.   |
| 5. Define UINT64 as an alias for unsigned long long integer.                                |

6. Write a statement to call `malloc()` function to allocate memory for x number of float point variables.

7. Define an unsigned integer *displayMask* and left shift 31 bits.

8. Define a union *number* with members int x and double y

9. Define a structure *bitCard* with three unsigned integers face, suite and color as members. Set the bit fields as 4, 2 and 1 respectively.

10. Define a singly linked list node as a structure "node" with char as data member.

**Q2:** Write the exact output of the following programs:

**(Marks 5)**

<pre>#include &lt;stdio.h&gt; struct card {     char *face;     char *suit; };  int main(void) {     struct card aCard;      aCard.face = "Ace";     aCard.suit = "Spades";      struct card *cardPtr = &amp;aCard;      printf("%s%s%s\n%s%s%s\n%s%s%s\n", aCard.face, " of ", aCard.suit, cardPtr-&gt;face, " of ", cardPtr-&gt;suit,     (*cardPtr).face, " of ", (*cardPtr).suit); }</pre>	
<pre>#include &lt;stdio.h&gt;  enum months {     JAN = 1, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP,     OCT, NOV, DEC };  int main(void) {  const char *monthName[] = { "", "January", "February", "March",     "April", "May", "June", "July", "August", "September", "October", "November", "December" };  for (enum months month = JAN; month &lt;= DEC; ++month)     {         printf("%2d%11s\n", month, monthName[month]);     } }</pre>	

## Section 2 (Marks 15)

**Q1:** Write a **function** using following prototype. The function inserts a node in a stack if space is available. It takes two parameters a pointer to the top of the stack and an integer value.

```
void push(StackNodePtr *topPtr, int infor)
```

**(Marks 5)**

[illegible]

**Q2:** Write a **program** to create and write on a sequential file “clients.txt”. If the file cannot be created, display a message “File could not be opened.”

Else the program prompts from user for inputting three fields; account, name and balance and keep on entering until EOF and then closes the file. A possible output is given below.

Use appropriate file handling functions and pointers as much as required and avoid using other alternatives. Failure in using any required function even not explicitly asked in the question will result in marks deduction. **(10 marks)**

```
Enter the account, name, and balance.  
Enter EOF to end input.  
? 100 Jones 24.98  
? 200 Doe 345.67  
? 300 White 0.00  
? 400 Stone -42.16  
? 500 Rich 224.62  
? ^Z
```

[illegible]

