



北京邮电大学

For examiners' use only

BBU4161 A

Joint Programme Examinations 2022/23

BBU4161 Programming Fundamentals

Paper A

Time allowed 2 hours

Answer ALL questions

1	
2	
3	
4	
5	
6	
7	
8	
Total	

Complete the information below about yourself very carefully.

QM student number

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BUPT student number

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Class number

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NOT allowed: electronic calculators and electronic dictionaries.

INSTRUCTIONS

1. You must **NOT** take answer books, used or unused, from the examination room.
2. Write only with a black or blue pen **and in English**.
3. Do all rough work in the answer book – **do not tear out any pages**.
4. If you use Supplementary Answer Books, tie them to the end of this book.
5. Write clearly and legibly.
6. **Read the instructions on the inside cover.**

Examiners

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Instructions

Before the start of the examination

- 1) Place your BUPT and QM student cards on the corner of your desk so that your picture is visible.
- 2) Put all bags, coats and other belongings at the back/front of the room. All small items in your pockets, including wallets, mobile phones and other electronic devices must be **placed in your bag in advance. Possession of mobile phones, electronic devices and unauthorised materials is an offence.**
- 3) Please ensure your mobile phone is switched off and that no alarm will sound during the exam. **A mobile phone causing a disruption is also an assessment offence.**
- 4) Do not turn over your question paper or begin writing until told to do.

During the examination

- 1) You must not communicate with or copy from another student.
- 2) If you require any assistance or wish to leave the examination room for any reason, please raise your hand to attract the attention of the invigilator.
- 3) If you finish the examination early you may leave, but not in the first 30 minutes or the last 10 minutes.
- 4) For 2 hour examinations you may **not** leave temporarily.
- 5) For examinations longer than 2 hours you **may** leave temporarily but not in the first 2 hours or the last 30 minutes.

At the end of the examination

- 1) You must stop writing immediately – **if you continue writing after being told to stop, that is an assessment offence.**
- 2) Remain in your seat until you are told you may leave.

Question 1

a) Choose the correct answer of each question:

[24 marks]

i) The starting element of the int array A[10] is ____ .

- A. A[10]
- B. A[0]
- C. A[1]
- D. A[9]

(1 marks)

ii) int a=1; float b; b is **NOT** 0.25 after executing _____ statement.

- A. b=a/4.0; B. b=(a*1.0)/4; C. b=(float)(a/4); D. (float)a/4;

(1 marks)

iii) Which is **NOT** a reserved word for C language:

- A. auto
- B. integer
- C. typedef
- D. while

(1 marks)

iv) Which of the following identifier is **illegal**?

- A. _identifier
- B. 1identifier
- C. Identifier1
- D. Identifier_1

(1 marks)

v) Given the code below, what will be the value of **i** after the loop?

for(i = 0; i < 5; ++i) ;

- A. 4 B. 5 C. 6 D. 7

(2 marks)

vi) A data type that reserves the same area in memory for two or more variables, but only one at a time, can actually be assigned to the _____ variable.

- A. structure B. point C. union D. char

(2 marks)

vii) What is the output of the following code?_____.

```
int a=3,b=5,i=5
while(--i)
a+=3; b+=2; printf("%d",a-b);
```

- A. 8
- B. 2
- C. -2
- D. 6

(2 marks)

viii) What is the output of the following code?_____

```
#include<stdio.h>
void swapAdd(int a,int *b);
int main()
{
    int a = 1,b = 2;
    swapAdd(a,&b);
    printf("%d,%d",a,b);
    return 0;
}
void swapAdd(int a,int *b){
    int temp = a+2;
    a = (*b)+1;
    (*b) = temp;
}
```

- A. 3,3
- B. 1,3
- C. 3,1
- D. 1,2

(3 marks)

ix) What is the output of the following code?_____

```
#include<stdio.h>
int main()
{
    int a[3][4] = {0};
    int i,j,k;
    for(i=k=0;i<3;i++){
        for(j=0;j<4;j++){
            a[i][j] = i+j+k;
            k++;
        }
    }
    printf("%d",*(*a+2));
    return 0;
}
```

- A. 4
- B. 10
- C. 2
- D. 6

x) What is the **output on the SCREEN** of the following code? _____

```
#include<stdio.h>
#include<string.h>
int main()
{
    char s[] = "abcdefgh";
    s[4] -= s[4];
    printf("%s,%s,%s",s,s+2,s+6);
    return 0;
}
```

- | |
|--|
| A. abcdefg,c,g
B. abcd,cd,gh
C. abc\0efg,c\0egh,egh
D. abcd0fg,cd0gh,gh |
|--|

(2 marks)

xi) What is the output of the following code? _____

```
#include<stdio.h>
void add(int *ar);
int main()
{
    int a[4] = {4,3,2,1};
    add(a);
    printf("%d,%d,%d,%d",a[0],a[1],a[2],a[3]);
    return 0;
}
void add(int *ar){
    *(ar+2) = *ar + 2;
}
```

- | |
|--|
| A. 4,3,2,1
B. 4,3,6,1
C. 4,6,2,1
D. 6,3,4,1 |
|--|

(3 marks)

xii) What is the output of the following code? _____

```
#include<stdio.h>
int main()
{
    int a[] = {1,3,5,7,9};
    int *p1 = a;
    int *p2 = p1;
    *++p1 = *p2++;
    *++p2 = *p1++;
    printf("%d,%d,%d,%d,%d",a[0],a[1],a[2],a[3],a[4]);
}
```

- | |
|--|
| A. 1,3,1,7,1
B. 1,1,1,7,9
C. 1,5,7,7,9
D. 3,5,7,9,9 |
|--|

(3 marks)

```
return 0;
```

```
}
```

	Do not write in this column
	24 marks

Question marking: $\frac{\quad}{24}$

Question 2

a) Answer the following questions:

[26 marks]

i) The function fscanf() returns _____ when encounter end of file.

(1 marks)

ii) Result of the expression “false || true && false == false && true || false ” (‘true’ represents 1 and ‘false’ represents 0) is _____.

(2 marks)

iii) A string is ended with ____ .

(1 marks)

iv) The output of the following code is _____ .

```
#define NUMROWS 3
#define NUMCOLS 4
#include <stdio.h>

int main(){
    int val[NUMROWS][NUMCOLS] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12};
    int i = 0, j = 0;
    int ans = 0;
    for(i = 0; i < NUMROWS; ++i){
        int sum = 0;
        for(j = 0; j < NUMCOLS; ++j){
            sum += val[i][j];
        }
        if(sum > ans){
            ans = sum;
        }
    }
    printf("%d", ans);
}
```

(2 marks)

v) What is the output of the following code? _____

```
#include<stdio.h>

void add(int b);

int a = 1;

int main(){
    add(a);
    add(a);
    add(a);
    printf("%d",a);
    return 0;
}

void add(int b){
    a += b;
}
```

(3 marks)

vi) What is the output of the following code? _____

```
#include<stdio.h>
#include<string.h>

int main()
{
```

```
char s[] = "abcdefgh";  
printf("%s",s+3);  
return 0;  
}
```

(2 marks)

vii) What is the output of the following code? _____

```
#include<stdio.h>  
void add(int b);  
int a = 0;  
int main()  
{  
    add(a);  
    add(a);  
    printf("%d",a);  
    return 0;  
}  
void add(int b){  
    b = b+1;  
}
```

(3 marks)

viii) The output of the following code is ____ .

```
#include<stdio.h>  
int sum(int n){  
    if(n <= 1){  
        return 1;  
    }  
    return n + sum(n - 1);  
}  
  
int main(){  
    printf("%d", sum(5));  
    return 0;  
}
```

(3 marks)

ix) What is the output of the following code? _____

```
#include<stdio.h>  
void add(int *b);  
int main()  
{
```



```

int a = 1;
add(&a);
add(&a);
printf("%d",a);
return 0;
}
void add(int *b){
    static int num = 1;
    (*b) += (num*(*b));
    num++;
}

```

(3 marks)

x) Which of the following statements are TRUE?

1. A function can receive many arguments but only one value can be returned directly.
2. A function's return type is the data type of the value returned by the function.
3. Static variables are initialized at run-time.
4. In C, the starting index value for all arrays is 1 .
5. A structure can be a return value of a function.
6. A structure can be a member of itself.

(6 marks)

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		26 marks

Question marking: $\frac{\quad}{26}$

Question 3**[15 marks]**

- a) Please write the following expression in 'C' language (All variables in the expression are float type, and the header file "math.h" is included):

$$\frac{-a + \sqrt[3]{b^{15} - 5ab - 6\cos(a-b)}}{2\sin(a + b)}$$

[3 marks]

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		3 marks

- b) Analyse the 'C' program below:

```

int F(int n)
{
    if (n==1||n==2)
    {
        return 1;
    }
    else if(n>=3)
    {
        return f(n-1)+f(n-2);
    }
    return F(-n);
}

```

[12 marks]

- i) What are the results of F(5.5) and F(-4) ?

(4 marks)

- ii) What will happen if we want to calculate F(0)?

(4 marks)

- iii) If we replace "return F(-n)" by "**return F(_____n_____)**" (please write an simple expression with 'n', numbers and symbol '+' and '-'), then the phenomenon in above question will be avoided, and at the same time the results of F(0) and F(-1) are 3 and 5 .

(4 marks)

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Question marking: $\frac{1}{3} + \frac{1}{12} = \frac{1}{15}$

Given a sequence of positive integers, a de-duplication operation is required to be performed on this sequence. By de-duplication, we mean that for each recurring number in this sequence, only the first occurrence of the number is retained and the remaining positions are deleted. Input data is end of -1. Please output the numbers in the sequence in order from smallest to largest. (Each number is ≤ 2000).

[15 marks]

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[illegible]

Question marking: $\frac{\text{—}}{15}$

Question 5

The "stu1.txt" file stores the ID, name, language score, math score, and English score of five students. However, due to carelessness, the language score and English score are reversed. Please use structure to read the data and store the correct information in the "stu2.txt" file.

For example, the input is 2022110000 ZhangSan 95 96 93(ID, name, language grades, math grades, English grades), the file content will be 2022110000 ZhangSan 93 96 95. Explanation : we exchange the language grades and English grades, and store it in stu2.txt file.

[20 marks]

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[illegible]

Question marking: $\frac{\quad}{20}$

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