Part 5(Structure & union & enum)

إجمالي النقاط 17/30

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* (Q29 ✓

Consider the following C declaration

```
struct {
    short s[5];
    union {
        float y;
        long z;
    }u;
} t;
```

Assume that objects of the type short, float and long occupy 2 bytes, 4 bytes and 8 bytes, respectively. The memory requirement for variable t, ignoring alignment considerations, is (GATE CS 2000)

- ○ 22
- ○ 14
- ◉ 18
- ○ 10

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* (Q15

Point out the error in the program in 16-bit platform?

```
#include<stdio.h>

int main()
{
    struct bits
    {
        int i:40;
    }bit;

    printf("%d\n", sizeof(bit));
    return 0;
}
```

- 4
- B. 2
- C. Error: Bit field too large
- D. Error: Invalid member access in structure

الإجابة الصحيحة

C. Error: Bit field too large

التعليقات

The width of int is 4 bytes (32 bits) or 2 bytes (16 bits) depending upon the machine, so the allocation for int is upto 32 bits. The declaration int i:40; exceeds the width of int so the .compiler generates the error:width of 'i' exceeds its type

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* (Q17

Point out the error in the program?

```
#include<stdio.h>

int main()
{
    struct emp
    {
        char name[25];
        int age;
        float bs;
    };
    struct emp e;
    e.name = "Suresh";
    e.age = 25;
    printf("%s %d\n", e.name, e.age);
    return 0;
}
```

- A. Error: Lvalue required/incompatible types in assignment
- B. Error: invalid constant expression
- C. Error: Rvalue required
- D. No error, Output: Suresh 25

الإجابة الصحيحة

A. Error: Lvalue required/incompatible types in assignment

التعليقات

We cannot assign a string to a struct variable like e.name = "Suresh"; in C.

*We have to use strcpy(char *dest, const char *source) function to assign a string.*

Ex: strcpy(e.name, "Suresh");

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* ? Q27)What will be the output of the program ✓

```
#include <stdio.h>
enum State {WORKING = 0, FAILED, FREEZED};
enum State currState = 2;

enum State FindState() {
    return currState;
}

int main() {
   (FindState() == WORKING)? printf("WORKING"): printf("NOT WORKING");
   return 0;
}
```

- ○ WORKING
- ◉ NOT WORKING
- ○ COMPILER ERROR
- ○ NONE OF ABOVE

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* (Q13

```c
#include<stdio.h>

int main()
{
    enum value{VAL1=0, VAL2, VAL3, VAL4, VAL5} var;
    printf("%d\n", sizeof(var));
    return 0;
}
```

- [A]. 1
- [B]. 2
- [C]. 4
- [D]. 10

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[B]. 2

التعليقات

enum always returns integer only so size is 2 bytes

0/1 * (Q18

Which of the following statements correct about the below program?

```
#include<stdio.h>

int main()
{
    union a
    {
        int i;
        char ch[2];
    };
    union a u1 = {512};
    union a u2 = {0, 2};
    return 0;
}
```

1: `u2` CANNOT be initialized as shown.
2: `u1` can be initialized as shown.
3: To initialize `char ch[] of u2 '.'` operator should be used.
4: The code causes an error 'Declaration syntax error'

- [ ] [A]. 1, 2
- [ ] [B]. 2, 3
- [ ] [C].1, 2, 3
- [x] [D]. 1, 3, 4

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- [x] [C].1, 2, 3

التعليقات

.u2 CANNOT be initialized as shown .1
,This line says that
;union a u2 = {0, 2}
This type of initialization cannot be done as we expected. Because, here the value 2, cannot be assigned to ch[] of u2 without '.' operator. It may cause syntax error in Turbo C .but no error GCC and as you said in Dev C

.u1 can be initialized as shown .2
,This line says that

;union a u1 = {512}
;This can be done. This will asign the value 512 to u1.i

.To initialize char ch[] of u2 '.' operator should be used .3
We have to use ('.' operator) to assing value for 'ch[]' of the union 'u2'. Example: u2.ch[0] = ;''x

.'The code causes an error 'Declaration syntax error .4
Since, we know that point-1 may cause error. But it was mentioned already. So, by fixing .this (if it causes any error), the rest part of the program will not cause any error

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* (Q6 ✓

What is the output of the program given below ?

```
#include<stdio.h>
int main()
{
    enum status { pass, fail, atkt};
    enum status stud1, stud2, stud3;
    stud1 = pass;
    stud2 = atkt;
    stud3 = fail;
    printf("%d, %d, %d\n", stud1, stud2, stud3)
    return 0;
}
```

A. 0, 1, 2 B. 1, 2, 3

C. 0, 2, 1 D. 1, 3, 2

- ○ A
- ○ B
- ◉ C
- ○ D

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* (Q7 ✓

```c
#include<stdio.h>

int main()
{
    enum days {MON=-1, TUE, WED=6, THU, FRI, SAT};
    printf("%d, %d, %d, %d, %d, %d\n", MON, TUE, WED, THU, FRI, SAT);
    return 0;
}
```

A. -1, 0, 1, 2, 3, 4

B. -1, 2, 6, 3, 4, 5

C. -1, 0, 6, 2, 3, 4

D. -1, 0, 6, 7, 8, 9

- ○ A
- ○ B
- ○ C
- ◉ D

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* (Q23

Which of the following statement is True?

[A]. User has to explicitly define the numeric value of enumerations

[B]. User has a control over the size of enumeration variables.

[C]. Enumeration can have an effect local to the block, if desired

[D]. Enumerations have a global effect throughout the file.

- (●) A
- ( ) B
- ( ) C
- ( ) D

الإجابة الصحيحة

C

التعليقات

:eg

```
void add()
}
enum a={mon,tue,wed};
..
..
{
```

here the enum variables are available only to the add function and not to any other function.

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* (Q14 ✓

```c
#include<stdio.h>

int main()
{
    struct a
    {
        float category:5;
        char scheme:4;
    };
    printf("size=%d", sizeof(struct a));
    return 0;
}
```

- A. Error: invalid structure member in printf
- B. Error in this float category:5; statement
- C. No error
- D. None of above

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* (Q8 ✓

```
#include<stdio.h>
int main()
{
    struct emp
    {
        char name[20];
        int age;
        float sal;
    };
    struct emp e = {"Tiger"};
    printf("%d, %f\n", e.age, e.sal);
    return 0;
}
```

A. 0, 0.000000

B. Garbage values

C. Error

D. None of above

- (●) A
- ( ) B
- ( ) C
- ( ) D

0/1 * (Q28

Assume that size of an integer is 32 bit. What is the output of following program?

```
#include<stdio.h>
struct st
{
    int x;
    static int y;
};

int main()
{
    printf("%d", sizeof(struct st));
    return 0;
}
```

- 4
- 8
- compiler error
- runtime error

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compiler error

التعليقات

In C, struct and union types cannot have static members. In C++, struct types are allowed to have static members, but union cannot have static members in C++ also.

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* Q21)Nested unions are allowed ✓

- (●) True
- ( ) False

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* (Q11

```c
#include<stdio.h>

int main()
{
    struct byte
    {
        int one:1;
    };
    struct byte var = {1};
    printf("%d\n", var.one);
    return 0;
}
```

- [A]. 1
- [B]. -1
- [C]. 0
- [D]. Error

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[B]. -1

التعليقات

If you store 1 in 1-bit field:

The left most bit is 1, so the system will treat the value as negative number.

The 2's complement method is used by the system to handle the negative values.

Therefore, the data stored is 1. The 2's complement of 1 is also 1 (negative).

Therefore -1 is printed.

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* Q2 ✓

What is the similarity between a structure, union and enumeration?

A. All of them let you define new values

B. All of them let you define new data types

C. All of them let you define new pointers

D. All of them let you define new structures

- ○ A
- ◉ B
- ○ C
- ○ D

0/1 * (Q25

What will be output of following c code?

```
void main()
{
    struct bitfield
    {
        signed int a:3;
        unsigned int b:13;
        unsigned int c:1;
    };
    struct bitfield bit1={2,14,1};
    clrscr();
    printf("%d",sizeof(bit1));
    getch();
}
```

- ○ 2
- ○ 4
- ◉ 8
- ○ 12

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◉ 4

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* (Q16 ✓

```c
#include<stdio.h>

int main()
{
    struct emp
    {
        char n[20];
        int age;
    };
    struct emp e1 = {"Dravid", 23};
    struct emp e2 = e1;
    if(e1 == e2)
        printf("The structure are equal");
    return 0;
}
```

- [ ] [A]. Prints: The structure are equal
- [x] [B]. Error: Structure cannot be compared using '=='
- [ ] [C]. No output
- [ ] [D]. None of above

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* (Q19 ✓

Which of the following statements correct about the below code?

```
maruti.engine.bolts=25;
```

A. Structure `bolts` is nested within structure `engine`.

B. Structure `engine` is nested within structure `maruti`.

C. Structure `maruti` is nested within structure `engine`.

D. Structure `maruti` is nested within structure `bolts`.

- ○ A
- ◉ B
- ○ C
- ○ D

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* (Q3 ✓

What will be the output of the program ?

```
#include<stdio.h>

int main()
{
    union a
    {
        int i;
        char ch[2];
    };
    union a u;
    u.ch[0]=3;
    u.ch[1]=2;
    printf("%d, %d, %d\n", u.ch[0], u.ch[1], u.i);
    return 0;
}
```

A. 3, 2, 515
B. 515, 2, 3
C. 3, 2, 5
D. 515, 515, 4

- (●) A
- ( ) B
- ( ) C
- ( ) D

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* ? Q10)What will be the output of the program ✓

```c
#include<stdio.h>

int main()
{
    struct value
    {
        int bit1:1;
        int bit3:4;
        int bit4:4;
    }bit={1, 2, 13};

    printf("%d, %d, %d\n", bit.bit1, bit.bit3, bit.bit4);
    return 0;
}
```

- ○ A. 1, 2, 13
- ○ B. 1, 4, 4
- ◉ C. -1, 2, -3
- ○ D. -1, -2, -13

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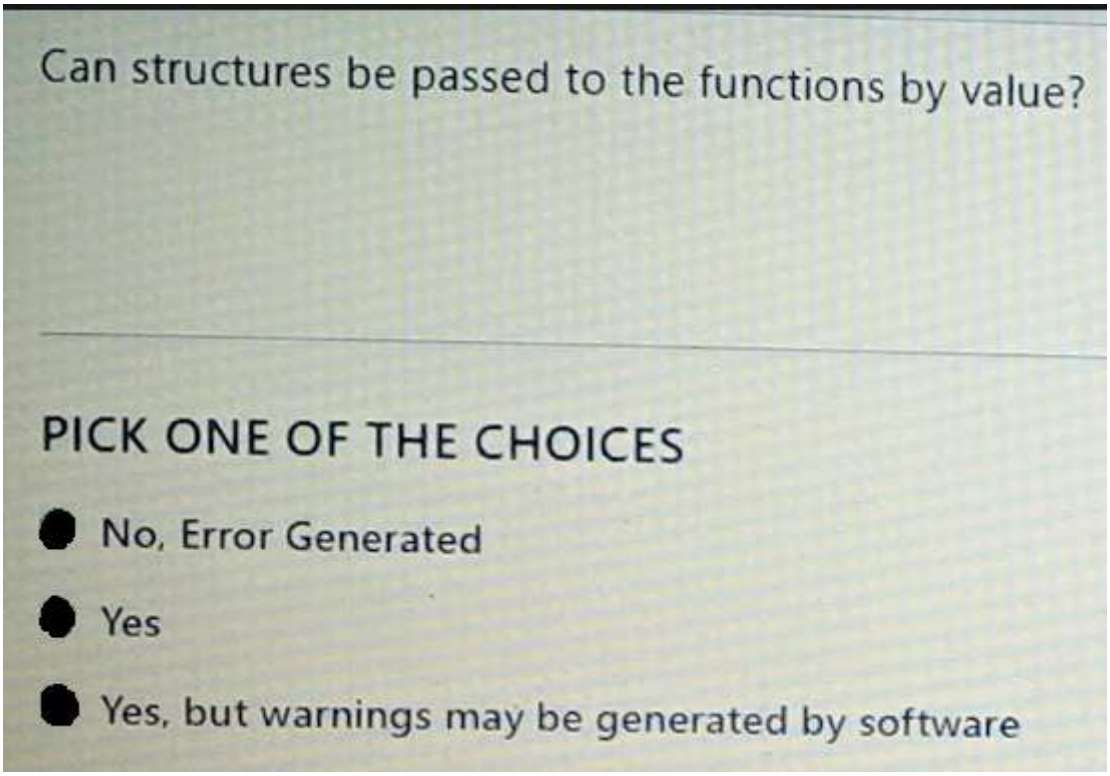
* (Q1 ✓


Can structures be passed to the functions by value?
PICK ONE OF THE CHOICES
No, Error Generated
Yes
Yes, but warnings may be generated by software

- ○ A
- ◉ B
- ○ C

0/1

* ?Q26) Is this code true ✗

```
enum state  {working, failed};
enum result {failed, passed};

int main()  { return 0; }
```

- ◉ true
- ○ false

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- ◉ false

التعليقات

'Compile Error: 'failed' has a previous declaration as 'state failed

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* (Q12 ✓

```
#include<stdio.h>

int main()
{
    enum days {MON=-1, TUE, WED=6, THU, FRI, SAT};
    printf("%d, %d, %d, %d, %d, %d\n", ++MON, TUE, WED, THU, FRI, SAT);
    return 0;
}
```

- ○ A. -1, 0, 1, 2, 3, 4
- ◉ B. Error
- ○ C. 0, 1, 6, 3, 4, 5
- ○ D. 0, 0, 6, 7, 8, 9

1/1

* (Q4 ✓

```c
#include<stdio.h>

int main()
{
    union var
    {
        int a, b;
    };
    union var v;
    v.a=10;
    v.b=20;
    printf("%d\n", v.a);
    return 0;
}
```

A. 10 B. 20

C. 30 D. 0

- ○ A
- ◉ B
- ○ C
- ○ D

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* (Q9

What is the Output

main.s main.c

```
1  //Prepared by Eng.Keroles
2  #include <stdio.h>
3  struct status_type {
4      unsigned char delta_cts:1;
5      unsigned char delta_dsr:1;
6      unsigned char tr_edge:1;
7      unsigned char delta_rec:1;
8      unsigned char cts:1;
9      unsigned char dsr:1;
10     unsigned char ring:1;
11     unsigned char rec_line:1;
12 } status;
13 int main(int argt ,char**argv) {
14     status.cts = 1 ;
15     printf ("sizeof structure = %d",sizeof(status));
16     return 0   ;
17 }
18
```

sizeof structure = 8

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sizeof structure = 1

1/1

* Q24)Union elements can be of different sizes

- (●) True
- ( ) False

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* .Q22)Bit fields CANNOT be used in union ✗

- ○ True
- ◉ False

ليس هناك أي إجابات صحيحة

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* Q20)A union cannot be nested in a structure ✓

- ○ True
- ◉ False

0/1

* (Q5

Point out the error in the program?

```
struct emp
{
    int ecode;
    struct emp e;
};
```

A. Error: in structure declaration

B. Linker Error

C. No Error

D. None of above

- ○ A
- ○ B
- ◉ C
- ○ D

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◉ A

التعليقات

The structure emp contains a member e of the same type (struct emp). At this stage compiler does not know the size of structure

0/1* Q30)Predict the output of above program. Assume that the size of an integer is 4 bytes and size of character is 1 byte. Also assume that there is no alignment needed.

```
union test
{
    int x;
    char arr[4];
    int y;
};

int main()
{
    union test t;
    t.x = 0;
    t.arr[1] = 'G';
    printf("%s", t.arr);
    return 0;
}
```

- A. Nothing is printed
- B. Garbage character followed by 'G'
- C. Garbage character followed by 'G', followed by more garbage characters
- D. Compiler Error
- E. G

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A. Nothing is printed

التعليقات

Since x and arr[4] share the same memory, when we set x = 0, all characters of arr are set as 0. O is ASCII value of '\0'. When we do "t.arr[1] = 'G'", arr[] becomes "\0G\0\0". When we print a string using "%s", the printf function starts from the first character and keeps printing till it finds a \0. Since the first character itself is \0, nothing is printed.