



**INSTITUTE OF SOFTWARE ENGINEERING**

**GRADUATE DIPLOMA IN SOFTWARE ENGINEERING**

**ASSIGNMENT NAME**

Programming fundamentals

**ASSIGNMENT NO**

03

NUMBER OF QUESTIONS: 32

NUMBER OF COMPLETED QUESTIONS: 32

NUMBER OF REMAINING QUESTIONS: 00

STUDENT NAME: M.G. ISURU PRABHATH

NIC: 200123601322

BATCH NO: 61

1.

Type	Size (in bits)	Range
byte	8	-128 to 127
short	16	-32,768 to 32,767
int	32	$-2^{31}$ to $2^{31}-1$
long	64	$-2^{63}$ to $2^{63}-1$
float	32	1.4e-045 to 3.4e+038
double	64	4.9e-324 to 1.8e+308
char	16	0 to 65,535
boolean	1	true or false

2.

- A. Legal (data range -128 to 127)
- C. Legal (data range -128 to 127)
- D. Legal (data range -128 to 127)
- E. Legal (data range -32 768 to 32 767)
- G. Legal (data range -32 768 to 32 767)
- H. Legal (data range -32 768 to 32 767)

3.

- A. Legal (char variable can added one letter)
- B. Legal (char variable can added one number)
- D. Legal (Boolean variable can added true)
- F. Legal (Boolean variable can added false)

4.

No	Decimal	Binary	Octal	Hexadecimal
A.	10	1010	12	A
B.	16	10000	20	10
C.	128	10000000	200	80
D.	255	11111111	377	FF
E.	32767	11111111111111	77777	7FFF
F.	1	1	1	1
G.	0	0	0	0
H.	26	11010	32	1A
I .	31	11111	37	1F

5.

- A. 11110110
- B. 10011100
- C. 11000000
- D. 11111111
- E. 11111101
- F. 10000000
- G. 00000000
- H. 10000000
- I . 11100000

6. A. Casting: Data type is converted into another data type by a programmer using casting operator.

```
import java.util.*;
class Example{
    public static void main(String args[]){
        short s=10;
        byte b;
        //b=s; //Illegal, incompatible types
        b=(byte)s; //casting, assign last 8bite to b
        System.out.println(b+" "+s); //10 10
    }
}
```

Conversion: A data type is converted into another data type by a compiler

```
import java.util.*;
class Example{
    public static void main(String args[]){
        byte b=10;
        short s;
        s=b; //Legal, Conversion
        System.out.println(b+" "+s); //10 10
    }
}
```

- B. Narrow Conversion: long range data type converted into short range data type by a compiler.

```
class Example{
    public static void main(String[] args){
        int age=20;
        long a=10;
        age+=a; //Narrow conversion
        System.out.println(age);
    }
}
```

Narrow Casting: Long range data type converted into short range data type by a programmer using casting operator

```
class Example{
    public static void main(String[] args){
        short s=100;
        byte b;
        b=(byte)s; //narrow casting
        System.out.println(b+" "+s);
    }
}
```

C. Wider Conversion: Short range data type converted into long range data type by a compiler.

```
class Example{
    public static void main(String[] args){
        byte b=100;
        short s;
        s=b; //wider conversion
        System.out.println(s+" "+b);
    }
}
```

Wider Casting: Short range data type converted into long range data type by a programmer using casting operator

```
class Example{
    public static void main(String[] args){
        char ch='A';
        System.out.println(ch); //prints A
        System.out.println((int)ch); //prints 65-->wider casting
    }
}
```

7. A  
E

8.

```
class Example{
    public static void main(String args[]){
        byte b1=10,b2=20,b3;
        b3=b1+b2; //Line 1
        b3=b1+1; //Line 2
        b3=b1*2; //Line 3
        short s1=10,s2=20,s3;
        s3=s1+s2; //Line 4
        s3=s1+1; //Line 5
        s3=s*1; //Line 6
        int x1=10,x2=20,x3;
        x3=x1+x2; //Line 7
        x3=b1+b2; //Line 8
        x3=b1+1; //Line 9
        x3=b1*2; //Line 10
        x3=s1+s2; //Line 11
        x3=s1+1; //Line 12
        x3=s1*1; //Line 13
    }
}
```

Adding two-byte variables or two short variables can be assigning an int variable only.

**9.** A C and E

**10.** A and B

**11.** B

**12.** A B and D

**13.** A B C D

**14.** 0 to 65535

**15.** A C and G

**16.** A. 3

B. -3

C. 3

D. -3

E. 3

F. -3

G. 3

**17.** Line 1

Line 2

Line 4

**18.** A D and E

**19.** A B C and D

**20.** A. 17

B. -10

C. -17

D. -3

E. 7

F. -3

**21.**

-100  
100  
-100  
-200  
400  
0

22.

```
100101
104
104
```

23.

```
101 100
102 101
103 102
```

24.

```
101 101
102 102
103 103
```

25.

```
100
100
100
101
102
103
```

26. A. 3

B. 0

C. 10

D. 0.0

E. 1.0999999999999996

27. A. 30

B. -10

C. 31

D. 31

E. 33

F. 34

G. 38

H. 39

28.  $X = 12 - 4 * 2$

$X = 12 - 8$

$X = 4$

$X = (12 - 4) * 2$

$X = 8 * 2$

$X = 16$

$$X = 12 - (4 \cdot 2)$$

$$X = 12 - 8$$

$$X = 4$$

**29.** A.  $X = 7\%10/2 \cdot 2$

$$= 7/2 \cdot 2$$

$$= 3 \cdot 2$$

$$= 6$$

B.  $X = 7\%(10/2) \cdot 2$

$$= 7\%5 \cdot 2$$

$$= 2 \cdot 2$$

$$= 4$$

C.  $X = 7\%10/(2 \cdot 2)$

$$= 7\%10/4$$

$$= 7/4$$

$$= 1$$

D.  $X = 7\%(10/(2 \cdot 2))$

$$X = 7\%(10/4)$$

$$X = 7\%2$$

$$X = 1$$

E.  $X = 7\%((10/2) \cdot 2)$

$$X = 7\%(5 \cdot 2)$$

$$X = 7\%10$$

$$X = 7$$

**30.** A.  $a = a + (a = 6)$

$$= 100 + (a = 6)$$

$$= 6$$

B.  $a = (a = 6) + a$

$$= 6 + 6$$

$$= 12$$

C.  $a = (a = 6) + (a = 5)$

$$= 6 + 5$$

$$= 11$$

D.  $a = a \cdot 3 + a$

$$= 11 \cdot 3 + 11$$

$$= 44$$

**31.** A.  $x = a++ + a$

$= 10 + 11$

$= 21$

B.  $x = a + a++$

$= 11 + 11$

$= 22$

C.  $x = ++a + a$

$= 13 + 13$

$= 26$

D.  $x = a + ++a$

$= 13 + 14$

$= 27$

E.  $x = ++a + ++a$

$= 15 + 16$

$= 31$

F.  $x = a++ + a++$

$= 16 + 17$

$= 33$

G.  $x = ++a + a++$

$= 19 + 19$

$= 38$

H.  $x = a++ + ++a$

$= 20 + 22$

$= 42$

**32.**

```
303
306
404 102
```