National University of Singapore

School of Computing

MID-SEMESTER TEST FOR Semester 2 AY2012/2013

CS1101E — Programming Methodology

9 March 2013 Time Allowed: 60 Minutes

INSTRUCTIONS TO CANDIDATES

1. This test paper contains TWENTY (20) questions and comprises 9 (nine) printed pages, including this page.

2. Each question is worth one mark. The maximum possible mark is 20.

3. Answer ALL questions by shading the letter corresponding to the most appropriate answer on the OCR form provided.

4. This is an OPEN BOOK test.

5. Do not look at the questions until you are told to do so.

6. There is no negative marking, so please attempt every question.

7. You may keep the question paper after the test is over.

For all the questions, assume that the relevant `#include` pre-processor statements have been included in the program where necessary.
Assume that all variables have been appropraitely declared beforehand.
Choose the most appropriate answer for each question.

1. What is printed out by the following C program fragment?

```
int a = 4, b = 2, c = 15, t = 0;
int x = ((t = (a < b) ? a : b) < c ) ? t : c;
printf("%d\n", x);
```

A. `0`

B. `2` ⟵

C. `4`

D. `15`

E. `None of the above.`

2. What is printed out by the following C program fragment?

```
#define mymacro(x, y) (x * y)
main() {
  a = 1; b = 2; c = 3;
  i = mymacro(a+b, c+c);
  j = mymacro(1+2, 3+3);
  k = mymacro(3, 6);
  printf("%d %d %d\n", i, j, k);
}
```

A. `10 10 10`

B. `10 10 18` ⟵

C. `10 18 18`

D. `18 18 18`

E. `None of the above.`

3. Which sequence of initial values of the three variables `a, b, c` which will cause *yes* to be printed?

```
d = 0;
if ((++a && ++b) || (++c && ++d)) ;
if (d) printf("yes\n");
```

A. `Any positive values for a, b and c.`

B. `Both a and b are positive, and c can be any integer.`

C. `-1, 0, -1`

D. `0, -1, 0` ⟵

E. `0, 0, -1`

4. Which sequence of initial values of the three variables `a, b, c` which will cause *yes* to be printed?

```
d = 0;
if ((++a || ++b) && (++c || ++d)) ;
if (d) printf("yes\n");
```

A. Any positive values for a, b and c.

B. One of a and b are positive, and c can be any integer.

C. -1, 0, 1

D. 0, -1, 0

E. 0, 0, -1 ⟵

5. What is printed out by the following C program fragment?

```
int x = 9, y = 12;
if (x < y)
    if (y > 5) y++;
    else x++;
    y++;
else
    y += 2;
x += 2;
printf("%d %d\n", x, y);
```

A. 6 18

B. 7 18

C. 7 16

D. A compilation error occurs. ⟵

E. None of the above.

6. What is the output of the following code segment?

```
int x = 5, y = 12;
if(x < y)
    if(y > 7) y++;
    else x++;
    y++;
    y += 2;
    x += 2;
    printf("%d %d\n", x, y);
```

A. 6 18

B. 7 18

C. 7 16 ⟵

D. A compilation error occurs.

E. None of the above.

7. What is printed out by the following C program fragment?

```
int i = 27, j = 13;
switch (i / 15) {
    case 0: j += 3;
    case 1: j /= 4;
    case 2: j *= 5;
    default: j -= 6;
}
printf("%i\n", j);
```

A. 8

B. 9 ⟵

C. 10

D. 11

E. None of the above

8. What is printed out by the following C program fragment?

```
int x = i = 0;
for(; i < 5; i *= 2)
x += ++i;
printf("%d\n", x);
```

A. 1

B. 2

C. 3

D. 4 ⟵

E. None of the above.

9. What is printed out by the following C program fragment?

```
int i = 5;
do {
    --i;
} while (i--);
printf("%i\n", i);
```

A. -2

B. -1 ⟵

C. 0

D. 1

E. None of the above

10. What is printed out by the following C program fragment?

```
int i = 6;
do {
    --i;
} while (i--);
printf("%i\n", i);
```

A. -2

B. -1

C. 0

D. 1

E. None of the above ⟵

11. What is the output of the following code segment?

```
int main() {
    int x = 0, count = 0;
    for(i = 0; i < 5; i++) {
        x += 2;
        for (j = 3; j < 5; j++) {
            if (x == 6) break;
            count++;
        }
    }
    printf("%d\n", count);
}
```

A. 6

B. 8 ⟵

C. 10

D. 12

E. None of the above

12. What is the output of the following code segment?

```
int main() {
    int x = 0, count = 0;
    for(i = 0; i < 5; i++) {
        x += 2;
        for (j = 3; j < 5; j++) {
            if (x == 6) continue;
            count++;
        }
    }
    printf("%d\n", count);
}
```

A. 6

B. 8 ⟵

C. 10

D. 12

E. None of the above

13. What is printed by the following C code fragment? Assume the user always enters five integers between -100 through 100, and at least one of these is a negative integer.

```
int i, n, x = -100;
for (i = 0; i < 5; i++) {
    printf("Enter an integer (-100 through +100): ");
    scanf("%d", &n);
    if (n < 0 && n > x)  x = n;
}
printf("%i\n", x);
```

A. The smallest negative number amongst the five numbers

B. The largest non-negative number amongst the five numbers

C. The largest negative number amongst the five numbers ⟵

D. The smallest non-negative number amongst the five numbers

E. None of the above.

14. What is the output of the following code segment?

```
int main() {
    int x = i = 1;
    for(; i < 8; i *= 3)
        x += i;
    printf("%d\n", x);
}
```

A. 3

B. 4

C. 5 ⟵

D. A compilation error occurs.

E. A run-time error occurs.

15. What is the output of the following code segment?

```
int main() {
    int x = i = 0;
    for(; i < 8; i *= 3)
        x += i;
    printf("%d\n", x);
}
```

A. 3

B. 4

C. 5

D. A compilation error occurs.

E. A run-time error occurs. ←

16. What is printed out by the following C program fragment?

```
int main() {
    int i = 0;
    myfunc(i);
    printf("%d", myfunc(i));
}

int myfunc(int i) {
    int j = 0;
    j += i + 2;
    i++;
    return j;
}
```

A. 0

B. 1

C. 2 ←

D. 3

E. None of the above.

17. What is printed out by the following C program fragment?

```
int j;

int main() {
    int i = 0;
    myfunc(i);
    printf("%d", myfunc(i));
}

int myfunc(int i) {
    j += i + 2;
    i++;
    return j;
}
```

A. 0

B. 1

C. 2

D. 4 ←

E. None of the above.

18. What is printed out by the following C program fragment?

```
int count = 0;
main() {
  zz1();
}
void zz1() {
  if (count > 1) return;
  printf("one ");
  zz2();
}
void zz2() {
  count++;
  printf("two ");
  zz1();
}
```

A. one two one two ⟵

B. one one two two

C. one one one one

D. two one two one

E. None of the above.

19. What is printed out by the following C program fragment?

```
int count = 0;
main() {
  zz1();
}
void zz1() {
  if (count > 1) return;
  printf("one ");
  zz2();
}
void zz2() {
  count++;
  zz1();
  printf("two ");
}
```

A. one two one two

B. one one two two ⟵

C. one one one one

D. two one two one

E. None of the above.

20. What is printed out by the following C program fragment?

```
int count = 0;
main() {
  zz1();
}
void zz1() {
  if (count > 1) return;
  printf("one ");
  zz2();
}
void zz2() {
  zz1();
  count++;
  printf("two ");
}
```

A. `one two one two`

B. `one one two two`

C. `one one one one`

D. `two one two one`

E. `None of the above.` ⟵

END of PAPER