Please read these instructions carefully!

- Answer the questions on the answer sheet.
- You may use the back of the test paper sheets for scratch work.
- Do not unstaple the test paper sheets!
- Instructions for answering:

	A	B	C	D	E
Select the answer (A):	●	○	○	○	○
Replace the answer (A) with answer (C):	✖	○	●	○	○
Cancel (C) and reactivate the answer (A):	⊗	○	✖	○	○
Do not answer (leave all circles unfilled):	○	○	○	○	○
Do not answer (two or more answers crossed):	✖	○	○	✖	○
NEVER leave a single answer crossed:	○	✖	○	○	○

- This test has 10 questions, each question is worth 2 points.
- **PENALTY POINTS** for incorrect answers:
  $1 = 0.133$ (6.67%) $2 = 0.267$ (13.33%) $3 = 0.4$ (20%) $4 = 0.534$ (26.67%)
  $\geq 5 = 0.667$ (33.33%)

NAME: _____   **Number:** _____

---

1. Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt?

   (A) Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.

   (B) Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

   (C) Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur.

   (D) Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

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2. Lorem ipsum dolor sit amet, consectetur adipisicing elit ($N \geq 3$)?
   (A) Smal.   (B) N (C) A very long choice.   (D) Quite exactly N.

---

3. Lorem ipsum dolor sit amet, consectetur adipisicing elit ($N \geq 3$)?

   (A) Smal.   (B) N (C) A very long choice.   (D) Quite exactly N.

---

4. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur?

   (A) `while`, `for`, and `repeat`.   (C) `continue`, `if-then-else`, and `for`.

   (B) `while`, `foreach`, and `repeat`.   (D) `stop`, `continue`, and `if-then-else`.

5. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum?

(A) 15   (B) 14   (C) 11   (D) 10

```
Counter counter = new Counter(1);
void primePrint() {
  long i = 0;
  long limit = 10;
  while (i < limit) {
    i = counter.getAndIncrement();
    print(i);
  }
}
```

6. Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat?

```
public interface Consensus<T> {
    T decide(T value);
}
```

(A) Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.

(B) Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

(C) Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur.

(D) Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

7. Lorem ipsum dolor sit r consectetur v_0. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat?

(A)
```
propose(value);
if (r.get() == v₀) {
  r.getAndSet(myId);
  decide(my value);
} else decide(other value);
```

(C)
```
propose(value);
old = r.getAndSet(myId);
if (old == v₀) decide(my value);
else decide(other value);
```

(B)
```
propose(value);
r.getAndSet(myId);
decide(my value);
```

(D)
```
propose(value);
while (r.get() != myId) {}
r.getAndSet(myId);
decide(my value);
```

8. Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat?

```
class Bakery implements Lock {
  private final boolean[] flag;
  private final int[] label;
  public Bakery(int n) {
    flag = new boolean[n];
    label = new int[n];
    for (int i = 0; i < n; i++) {
      flag[i] = false;
      label[i] = 0;
    }
  }
```

```
private int maxLabel() {
  int m = 0;
  for (int x : label) {
    if (x > m) m = x;
  }
  return m;
}
```

```
 public void lock() {                              public void unlock() {
   int i = ThreadID.get();                            int i = ThreadID.get();
   flag[i] = true;                                    flag[i] = false;
   label[i] = maxLabel() + 1;                        }
   for (int k = 0; k < label.length; k++)}
     if (k == i) continue;
     while (flag[k] && (label[k] < label[i]
         || (label[k] == label[i] && k < i))) {
       // wait
     }
   }
 }
```
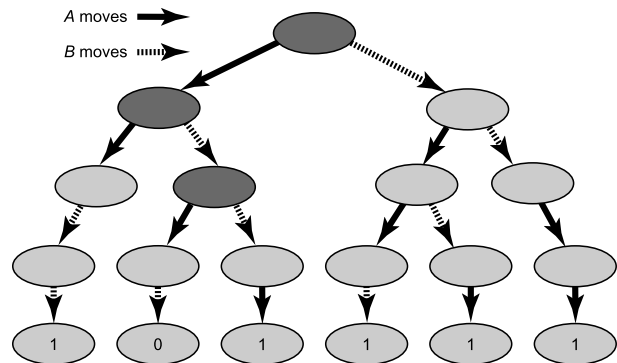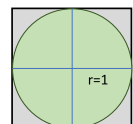
(A) Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.

(B) Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

(C) Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur.

(D) Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

9. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum?

(A) Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.

(B) Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

(C) Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur.

(D) Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

10. Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat $r = 1$ (see illustrative figure on the right)?

(A) $\rho = \pi^2$ (B) $\rho = \frac{\pi}{4}$ (C) $\rho = \frac{1}{\pi}$ (D) $\rho = \frac{4}{\pi}$