

## SOLUTION NOTES

*As submitted to the Examiners in January 2001.*

### Programming in Java 2001 Paper 1 Question 10 (ACN)

In each case there will be plenty of variations that can be used, but in all cases the students has an opportunity to show how well they can control Java syntax and style.

- (1) in some sense the iterative ML function encourages

```
while (n != 0) r *= n--;
```

```
... r ...
```

but a direct recursive function translation would be OK

- (2) abstract class Tree3;

```
class Leaf extends Tree3 { Object val; }
```

```
class Node extends Tree3 { Tree3 a, b, c; }
```

- (3) int [] v = new int [] {1,2,3,7};

```
int [] v2 = new int [3];
```

```
for (int i=0; i<4; i++) v2[i] = v[i]*v[i]; ?????
```

- (4) class Disaster extends Exception {

```
int val;
```

```
Disaster(int v) { val = v; }
```

```
}
```

```
... raise new Disaster(99);
```

- (5) Use methods for recursiveLength() in each sub-class of the list

datatype so that the pattern matching turns into class method dispatch.