Answers and Solutions

Exam #4 ~ Multiple Choice

1. E	11. C	21. C	31. E
2. E	12. A	22. E	32. A
3. B	13. B	23. C	33. B
4. C	14. D	24. E	34. D
5. D	15. B	25. E	35. D
6. E	16. C	26. C	36. D
7. B	17. A	27. E	37. E
8. A	18. E	28. A	38. D
9. E	19. B	29. C	39. B
10. D	20. C	30. A	40. D

Notes:

1. `1 < x/y < 2` and `4 < x*y < 5`; truncated to integers gives 1 + 4 = 5.

2. Applying one of De Morgan's Laws, we can see that the expressions in Options I and II are equivalent. The expression in Option III is `true` when `x ≠ y`, the same as I and II.

3. Can't convert a `String` into an `Integer` this way — not allowed in Java.

4. `abc1` is first set to `"AAABBBCC"`, then to `"AABBBCC"`; it is a substring of `abc`, starting at index 1.

5. Use De Morgan's Laws: `!(x > y && x % y != 0)` is the same as `(x <= y || x % y == 0)`.

6. Inheritance hierarchies are at the heart of OOP for the reasons listed in the question.

7. `list.remove(i)` shifts to the left all the subsequent elements. Therefore, it is a mistake to increment `i` when an element is removed: the subsequent element won't be examined.

8. `arr[0]` is never changed, which leaves us with Choices A and B. On the last iteration, `arr[7]` is assigned the value of `arr[5]`, which is 6.

9. `smile(4)` prints `"smile!"` 4 times, then calls `smile(3)`, and so on. The total number of times `"smile!"` will be printed is 4 + 3 + 2 + 1 = 10.

10. `smile` is called in succession with parameters 4, 3, 2, 1, and 0.

11. The statements compile fine due to autoboxing: 2021 is converted into an `Integer` object. `compareTo` returns an `int`, not a `boolean`; in this case it returns a negative integer (actually -1), because 2020 is less than 2021.