Name _____   E-mail _____

Instructions:

1. Fill in your name and e-mail above.

2. The test is worth a total of 50 points. The value for each question is given in brackets at the end of the question.

3. If you do not understand a question, raise your hand and I will come over for you to ask me about it. I may or may not answer your question but you should still ask.

4. If a question asks you to show every step, then you have to show all steps to get full points.

5. Try not to leave a question blank. At least write something you think is relevant with the question. You might know more than you think you do, and I can't give partial credit for a blank answer!

6. A late submission will incur a penalty of 5 points. Zero will be assigned if there is no submission after Oct 15, 2025, 11:59 PM CST.

7. Please do not use generative AI tools.

Question-1: Write True or False for the following statements **[20]**

1. A highly mature organization will have software quality assurance prized out from the software development process.
2. Compared to audits conducted by a federal agency, code inspection is an informal software quality assurance activity.
3. A generative AI application for identifying malware in 1 Python program needs 5 seconds for execution including running the test cases. The same generative AI application for identifying malware will need 250 seconds for 50 Python programs for execution including running the test cases.
4. For retrospective meetings conducted in scrum, the client can be involved sometimes.
5. It is necessary to have a daily standup meeting even if the team members think that these standup meetings are hurting productivity.
6. For configuration management, it is sufficient to take the baseline snapshot of the configurations for the software of interest.
7. Generative AI tools that use the encoder-decoder architecture could be a good fit for converting test cases written in Python to test cases written in Julia.
8. As part of the continuous integration process, it is sufficient to merge the code changes into a branch.
9. Code and design smells will always result in bugs after a certain amount of time.
10. One benefit of using abstract syntax trees for static program analysis is that it contains full details of the program needed for data tracking.

Question-2: List all expressions that are available after a statement is executed for the entire Python program shown below. How many definitions are used in line number 7 for the following Python program? List all the definitions. Is there an expression that is never used at all?
[10]

```
1   if __name__ == '__main__':
2       x = 500
3       y = 10
4       while (x > 1):
5           z = 10 - x
6           y = x * y
7           x = x - 1
```
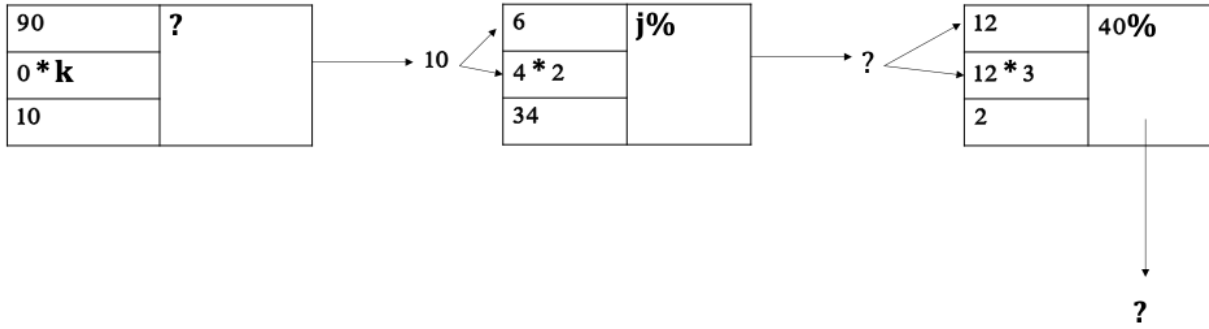
Answer:

Question-3: Use the following configurations to explain the state reconciliation approach used in infrastructure as code (IaC). **[10]**

Name: 'execute.sh', mode: 0700, directory: '/comp5710/execs/', content: '#!bin/bash \n echo "Hello World!"', owner: 'test', group: 'test'

Question-4: Report the values for 'k', 'j', and '?'. Use the knowledge of defect amplification model to answer this question. [10]

Answer:

90	?
0 * k	
10	

→ 10

6	j%
4 * 2	
34	

→ ?

12	40%
12 * 3	
2	

?