CSE 309 Class Test 4

* Required

1. Email *

2. Name (maximum 50 characters) *

3. Write your 7-digit student number below, e.g., 1705001. *

4. Mobile No. (11-digit) *

Instructions and Pledge

5. I hereby declare that, I shall not misuse, in any form or method, the course materials including but not limited to, Lecture Notes, Reading Materials, Audio and Video of Lectures of this course, Codes and Editors. I shall not adopt any unfair means during the exam and shall not receive any help or offer/provide help to anyone in any manner whatsoever. I will not expose the hard copy and soft copies of the questions and answers to any person/party/media. I agree to accept any punitive measure taken by the BUET Authority, if at any time during or after completion of the course if it is revealed/violated otherwise. *

Check all that apply.

- [ ] I agree

6. Read the below instructions carefully. *

Instructions

1. Total marks is 20. All questions are *not* of equal marks. Please find the marks allotted for each question to its right.
2. **There will be negative marking. 25% marks of a question will be deducted for an incorrect answer.**
3. Total time is 20 minutes. No submission will be accepted after the time is over.
4. Close all resources such as books, slides, codes, other tabs in your browser etc.
5. Shut down all other communication media that are not being used for taking the class test.
6. Periodically save your answers by pressing the Submit button. You can edit your responses as many times you want within the exam duration.
7. Keep your camera TURNED ON all the time.

Check all that apply.

- [ ] I have read all the instructions.

Password

Password Will be provided by the instructors.

7. Password *

Questions

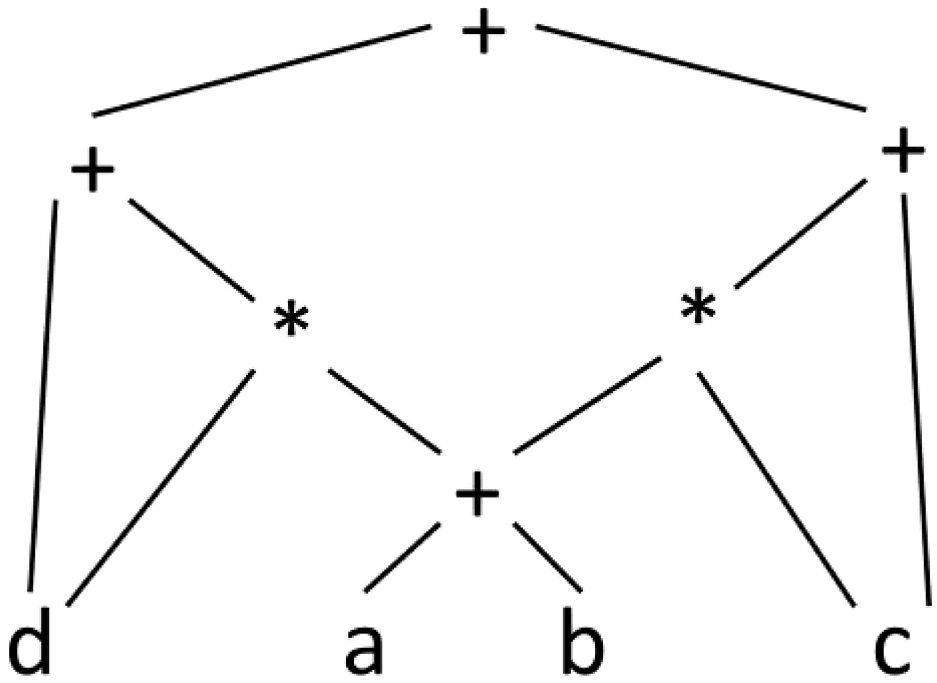
25% marks of a question will be deducted for an incorrect answer.

8. Which of the following is not an intermediate representation? 1 point

Mark only one oval.

- ◯ Syntax tree
- ◯ DAG
- ◯ Three address code
- ◯ Parse tree
- ◯ None of the given answers

9. Which expression does the following DAG correspond to? 2 points



Mark only one oval.

- d+d*(a+b)+(a+b)*c+c
- d+(d*(a+b)+(a+b)*c)+c
- d+d*(a+b)+((a+b)*c+c)
- None of the given answers

10. Which of the three address codes the given quadruples representation correspond to? 1 point

	op	arg1	arg2	result
1	*	b	c	t1
2	minus	t1		t2
3	+	a	t2	t3
4	+	t2	t3	t4
5	=	t4		d

A.
t1 = b*c
t2 = minus t1
t2 = a + t3
t4 = t2 + t3
d = t4

B.
b= c*t1
t1 = minus t2
t3 = a + t2
t4 = t2 + t3
d = t4

C.
t1 = b*c
t2 = minus t1
t3 = t2 + t4
t4 = t2 + t3
t4 = d

D. None of the given answers

Mark only one oval.

- A
- B
- C
- D

11. To which expression the below triples representation corresponds to? 1 point

	op	arg1	arg2
1	*	b	c
2	+	a	(1)
3	-	d	(2)
4	*	(2)	(3)
5	=	e	(4)

Mark only one oval.

- [ ] e=(a+b*c)*(d-(a+b*c))
- [ ] e=d-(a+b*c)
- [ ] e=(a+b*c)*d-(a+b*c)
- [ ] None of the given answers

12. Which of the following representations of three address codes is suitable for an optimizing compiler that moves instructions as a part of optimization? 1 point

Mark only one oval.

- [ ] Indirect quadruples
- [ ] Triples
- [ ] Indirect triples
- [ ] DAG

13. Which of the following is a valid SSA form for the given three address code? 2 points

```
w = a + b
x = w – c
w = x + y
w = d – w
x = w + x
```

A.
```
w1 = a + b
x1 = w1 – c
w2 = x1 + y
w3 = d – w2
x2 = w2 + x1
```

B.
```
w1 = a + b
x1 = w1 – c
w2 = x1 + y
w3 = d – w2
x2 = w3 + x1
```

C.
```
w1 = a + b
x1 = w1 – c
w2 = x1 + y
w3 = d – w3
x2 = w3 + x2
```

D. None of the given answers

Mark only one oval.

- A
- B
- C
- D

14. What is the type expression for int[5][6][7] 1 point

Mark only one oval.

- array(5,array(6,array(7,integer)))
- array(7,array(6,array(5,integer)))
- array(5,6,7,integer)
- None of the given answers

15. The following SDT computes the types and widths for basic and array types involving integers only. While implementing the SDT, a student erroneously wrote the last production as C -> C1 [num] instead of C -> [num] C1. He wrote all other parts correctly. Now, according to his (incorrect) implementation, what would be the calculated type for the input int[2][3][4]? 2 points

$T \rightarrow B$	$\{ t = B.type; w=B.width; \}$
C	$\{ T.type = C.type; T.width=C.width; \}$
$B \rightarrow \mathbf{int}$	$\{ B.type = integer; B.width=4; \}$
$C \rightarrow \epsilon$	$\{ C.type = t; C.width=w; \}$
$C \rightarrow [\mathbf{num}]\ C1$	$\{ C.type = array(\mathbf{num}.value, C1.type);$ $C.width = \mathbf{num}.value\ X\ C1.width \}$

Mark only one oval.

- array(2, array(3,array(4, integer)))
- array(4, array(3,array(2, integer)))
- array(96, integer)
- None of the given answers

16. Which of the following represents the correct semantic rules for the production: S -> Do S1 while (B)? 3 points

A. S1.next = newlabel()
B.true = newlabel()
B.false = S.next

S.code = label(B.true) || S1.code || label(S1.next) || B.code

B. S1.next = S.next
B.true = S.next
B.false = newlabel()

S.code = S1.code || label(B.false) || B.code

C. S1.next = S.next
B.true = newlabel()
B.false = newlabel()

S.code = label(B.true) || S1.code || B.code || label(B.false)

D. None of the above

Mark only one oval.

- [x] A
- [ ] B
- [ ] C
- [ ] D

17. Identify the true and false labels of B1 and B2 in the semantic rules for generating three address codes for the production B -> B1 II B2. (Though has it 4 points, the marks allocated will be 2). 4 points

Mark only one oval per row.

	B.true	B.false	newlabel()
B1.true	◯	◯	◯
B2.true	◯	◯	◯
B1.false	◯	◯	◯
B2.false	◯	◯	◯

18. Which of the following is a valid short -circuit code for the expression: if ((x<100 || x>200) && x!=y) x=0. 2 points

A.
```
if x < 100 goto L2
ifFalse x>200 goto L1
ifFalse x!=y goto L1
L1: x=0
L2:
```

B.
```
if x < 100 goto L1
ifFalse x>200 goto L2
ifFalse x!=y goto L1
L1: x=0
L2:
```

C.
```
if x < 100 goto L2
if x>200 goto L2
if x!=y goto L2
L1: x=0
L2:
```

D. None of the above

Mark only one oval.

- ( ) A
- ( ) B
- ( ) C
- ( ) D

19. Given below the partial semantic rules (showing only the label assignments) for generating three address codes for the production for 'for loop', S -> for (S1; B; S2) S3. What will be the rule for S.code? 2 points

S1.next = newlabel()
B.true = newlabel()
B.false = S.next
S2.next = S1.next
S3.next = newlabel()
S.code = _____

A. S.code = S1.code || B.code || label(B.true) || S3.code || label(S3.next) || S2.code || gen('goto', S1.next)

B. S.code = S1.code || label(S1.next) || B.code || label(B.true) || S3.code || label(S3.next) || S2.code

C. S.code = S1.code || label(S1.next) || B.code || label(B.true) || S3.code || label(S3.next) || S2.code || gen('goto', S1.next)

D. None of the above

Mark only one oval.

- [ ] A
- [ ] B
- [x] C
- [ ] D