

Bachelor Level / sixth-semester / Science Full marks: 60 **Computer Science and Information Technology(CSC365)** Pass marks: 24
(Compiler Design and Construction) Time: 3 hours Candidates are required to give their answers in their own words as far as practicable.
The figures in the margin indicate full marks.

Attempt all questions. (10x6=60)

1. Draw block diagram of compiler. Explain different steps in the synthesis phase.
2. What is the role of regular expression in lexical analysis? Also give an example.
3. What is shift reduce parsing technique? Show shift reduce parsing action for the string $a^*(a+a)$, given the grammar

$$E \rightarrow E+E \mid E * E \mid (E) \mid a$$

4. Find first and follow for the non-terminals in the following grammar.

$$S \rightarrow Aa \mid bAc \mid Bc \mid bBa$$

$$A \rightarrow d$$

$$B \rightarrow aA$$

5. What is semantic analysis? Why is it necessary to perform semantic analysis? Explain.
6. Write Syntax Directed Definition to carry out type checking for the following expression.

$$E \rightarrow id \mid E1 \text{ op } E2 \mid E1 \text{ relop } E2 \mid E1[E2] \mid E1 \uparrow$$

7. What is code optimization? What is its importance?
8. Explain different types of loop optimization techniques.
9. Define three address codes. Write three address code for
 $a = -b*(c+d)$
10. Discuss the importance of error handlers in the compiler. How is it manipulated in the different phases of compilation?