PAPER ID-310531

Subject Code: KCS502

Roll No: | | | | | | | | | | | | | |

# B TECH
## (SEM-V) THEORY EXAMINATION 2020-21
## COMPILER DESIGN

***Time: 3 Hours*** ***Total Marks: 100***

**Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.

## SECTION A

**1. Attempt *all* questions in brief. 2 x 10 = 20**

| Qno. | Question | Marks | CO |
|---|---|---|---|
| a. | What is YACC? Discuss about it. | 2 | CO 1 |
| b. | Design a DFA for the following regular expression: $(x+y)^*xyy$ | 2 | CO 1 |
| c. | Consider the following grammar:<br>S→B\|SabS, B→bB\| ε<br>Compute FOLLOW(B) | 2 | CO 2 |
| d. | Discuss about shift-reduce parsing. | 2 | CO 2 |
| e. | Find the postfix notation for the following expression:<br>(a+b+c)*(c+q) | 2 | CO 3 |
| f. | Discuss about non-linear type intermediate code. | 2 | CO 3 |
| g. | Write short note on "Activation Record" | 2 | CO 4 |
| h. | Discuss about hash table. | 2 | CO 4 |
| i. | Discus about constant folding. | 2 | CO 5 |
| j. | Discuss about designing issues of code generator. | 2 | CO 5 |

## SECTION B

**2. Attempt any *three* of the following: 3 x 10 = 30**

| Qno. | Question | Marks | CO |
|---|---|---|---|
| a. | Explain in detail the process of compilation for the statement a=b+c*70. | 10 | CO 1 |
| b. | Construct the CLR(1) parsing table for the following grammar:<br>S→AA, A→aA\|b | 10 | CO 2 |
| c. | Consider the following grammar and give the syntax directed definition to construct parse tree for the input expression 4*7+3*9. Also construct an annotated parse tree according to your syntax directed definition.<br>E→E+T\|T, T→T*F\|F, F→num. | 10 | CO 3 |
| d. | Explain lexical, syntax, semantic phase errors in detail. | 10 | CO 4 |
| e. | Explain in detail about loop optimization. | 10 | CO 5 |

## SECTION C

**3. Attempt any *one* part of the following:**

| Qno. | Question | Marks | CO |
|---|---|---|---|
| a. | (i). Write a regular expression to represent a language consisting of strings made up of odd number of a & odd number of b.<br>(ii). Write a CFG to represent the language $L=\{a^{n+m}b^n \mid m,n\geq 1\}$. | 10 | CO 1 |
| b. | (i). Check whether given grammar is ambiguous or not. If ambiguous then convert it into unambiguous grammar:<br>E→E+E\|E*E\|id<br>(ii). Discuss about cross compiler. | 10 | CO 1 |

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**4. Attempt any *one* part of the following:**

| Qno. | Question | Marks | CO |
|---|---|---|---|
| a. | Check whether the given grammar is LR(0) or not:<br>S→PQy, P→Sy\|x, Q→yS | 10 | CO 2 |
| b. | Find the precedence and function table of the following grammar by using operator precedence technique.<br>P→SR\|S, R→bSR\|bS, S→WbS\|W, W→L*W\|L, L→id | 10 | CO 2 |

**5. Attempt any *one* part of the following:**

| Qno. | Question | Marks | CO |
|---|---|---|---|
| a. | Translate the following arithmetic expression into quadruples and triples:<br>(i). x=y*z+y*-z<br>(ii). a=-b*(c+d)+b | 10 | CO 3 |
| b. | Generate three address code for the following code:<br>Switch p+q<br>{<br>case 1: x=x+1<br>case 2: y=y+2<br>case 3: z=z+3<br>default: c=c-1<br>} | 10 | CO 3 |

**6. Attempt any *one* part of the following:**

| Qno. | Question | Marks | CO |
|---|---|---|---|
| a. | What is symbol table? Explain various data structures used for symbol table. | 10 | CO 4 |
| b. | (i). Explain the function of error handling phase of a compiler.<br>(ii). Write short note on scoping. | 10 | CO 4 |

**7. Attempt any *one* part of the following:**

| Qno. | Question | Marks | CO |
|---|---|---|---|
| a. | Construct the flow graph for the following code segment:<br>fact(n)<br>{<br>int f=1;<br>for(i=2; i≤n; i++)<br>f=f*i;<br>return f;<br>} | 10 | CO 5 |
| b. | Define a DAG. Construct a DAG for the expression:<br>p+p*(q-r)+(q-r)*s | 10 | CO 5 |