BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2024)

CLASS: BTech **SEMESTER: VI/ADD**
BRANCH: CSE **SESSION : SP/2024**

SUBJECT: CS333/CS305 COMPILER DESIGN

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Distinguish between *compiler & assembler*.	[2]	1	1
Q.1(b)	What are the *phases* of a typical compiler?	[3]	2	1
Q.2(a)	Briefly explain the concept of *binary translation*.	[2]	2	1
Q.2(b)	Explain the concept of *bootstrapping* w.r.t. a compiler.	[3]	1	1
Q.3(a)	Distinguish between *lexemes, patterns, tokens*.	[2]	2	1
Q.3(b)	Draw the *NFA* to recognize the following *regular expression*: (*letter)(letter|digit)** where *letter & digit* are *regular definitions* given as: *letter=a|b|c|…….|z* (all the English alphabets in lower case) *digit= 0|1|2|3…..|9* (all the digits in the decimal number system)	[3]	2	2, 3
Q.4(a)	Consider a grammar *G= {T,N,P,S}*, where: *T*= set of *terminals= {s, ;}* *N*= set of *non-terminals= {stmt-seq, stmt}* *P*= set of *productions= {stmt-seq→stmt ; stmt-seq|stmt; stmt → s}* *S= start symbol= {stmt-seq}* What is *L(G)*- the *language* generated by *G*?	[2]	4	2, 3
Q.4(b)	Consider a grammar *G= {T,N,P,S}*, where: *T*= set of *terminals= {(,), num, +, -, *}* *N*= set of *non-terminals= {exp, op}* *P*= set of *productions= {exp→exp op exp|(exp)|num, op→+|-|*}* *S= start symbol= {exp}* Show that *G* is *ambiguous* with the *input string*: *num-num*num*	[3]	4	2, 3
Q.5(a)	Consider a grammar *G= {T,N,P,S}*, where: *T*= set of *terminals= {other, if , (,) ,0, 1, else}* *N*= set of *non-terminals= {stmt, if-stmt, exp, else-part}* *P*= set of *productions= {stmt→if-stmt|other; if-stmt→if(exp)stmt else-part, else-part→else stmt|ε, exp→0|1}* *S= start symbol= {stmt}* Find First set for all non-terminal of G?	[2]	4	2, 3
Q.5(b)	Consider an *augmented* grammar *G= {T,N,P,S}*, where: *T*= set of *terminals= {p, +}* *N*= set of *non-terminals= {A', A}* *P*= set of *productions= {A'→A, A→A+p|p* *S= start symbol= {A'}* What are the *LR(0) items*?	[3]	4	2, 3

::::::22/02/2024::::::M