UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, April/May 2018

Course: CSEG326 **Semester: VI**
Program: Int B.Tech CSE+CyberLaw
Time: 03 hrs. **Max. Marks: 100**

Instructions: Answer all questions. There's no choice in this question paper.

SECTION A

S. No.		**Marks**	**CO**
Q 1	What are the various 'cousins of compilers'? What is their role in program execution? Explain.	**4**	**CO1**
Q2	What are the basic blocks of a LEX and YACC Programs? How are they used to write an efficient parser?	**4**	**CO2**
Q3	a) What are grammars for a language? What are the advantages of having a grammar for a language?	**4**	**CO2**
Q4	Show using appropriate examples the use of syntax directed translations while semantic analysis.	**4**	**CO3, CO5**
Q5	How is the dependency graphs formed? Explain with example.	**4**	**CO4**
	SECTION B		
Q6	Write a LEX and YAAC programs to check whether the parentheses are balanced. Example ()()() ok ()()) not ok	**8**	**CO2**
Q7	Using the notational conventions of grammars, specify which symbols are terminals and which non terminals in the following grammar rule. S→**if**(***expr***)**then**{***stmt***} Show how the above statement will be processed in varous phases of a compiler.	**8**	**CO2,CO3**
Q8	Why do we need intermediate representation while compilation? Explain the Directed Acyclic Graphs and their role in Semantic Analysis.	**8**	**CO3, CO4**

Q9

For the following grammar rules. Find the first and follow sets.

$$\begin{aligned} \textit{stmt} &\rightarrow \textbf{declare id } \textit{option\_list} \\ \textit{option\_list} &\rightarrow \textit{option\_list option} \mid \epsilon \\ \textit{option} &\rightarrow \textit{mode} \mid \textit{scale} \mid \textit{precision} \mid \textit{base} \\ \textit{mode} &\rightarrow \textbf{real} \mid \textbf{complex} \\ \textit{scale} &\rightarrow \textbf{fixed} \mid \textbf{floating} \\ \textit{precision} &\rightarrow \textbf{single} \mid \textbf{double} \\ \textit{base} &\rightarrow \textbf{binary} \mid \textbf{decimal} \end{aligned}$$

8

CO2

Q10

a) Eliminate left recursion. State the steps/rules also.

$$\begin{aligned} S &\rightarrow (L) \mid a \\ L &\rightarrow L , S \mid S \end{aligned}$$

b) Eliminate left factoring. State the steps

$$\begin{aligned} S &\rightarrow iEtS \mid iEtSeS \mid a \\ E &\rightarrow b \end{aligned}$$

4+4=8

CO2

SECTION-C

Q11

Explain the LR model. Stating the rules of LR machine, Parse the string **Id*(id)+(id)** using the table and grammar rules given. Build the parse tree also.

(1) $E \rightarrow E + T$

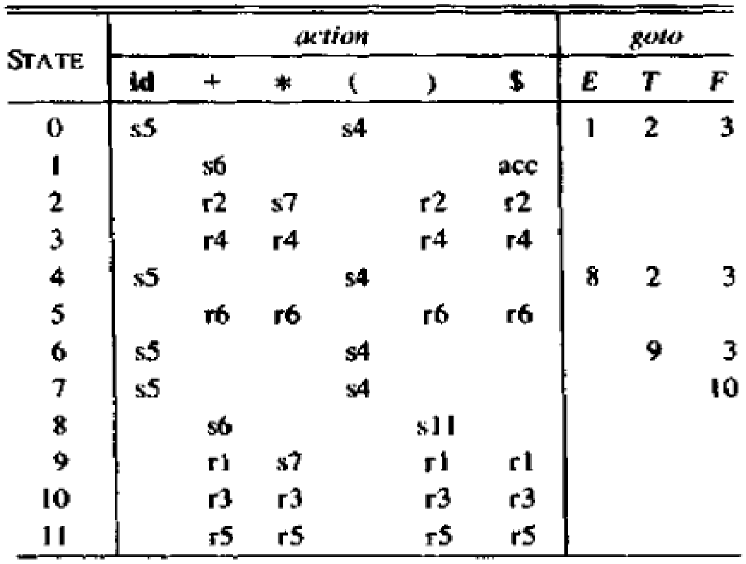
(2) $E \rightarrow T$

(3) $T \rightarrow T * F$

(4) $T \rightarrow F$

(5) $F \rightarrow (E)$

(6) $F \rightarrow \textbf{id}$



STATE	*action*						*goto*		
	id	+	*	(	)	$	*E*	*T*	*F*
0	s5			s4			1	2	3
1		s6				acc			
2		r2	s7		r2	r2			
3		r4	r4		r4	r4			
4	s5			s4			8	2	3
5		r6	r6		r6	r6			
6	s5			s4				9	3
7	s5			s4					10
8		s6			s11				
9		r1	s7		r1	r1			
10		r3	r3		r3	r3			
11		r5	r5		r5	r5			

20

CO2

Q12

Describe with proper examples various ways and places of code optimization. What is the role of intermediate codes in code optimization?

20

CO5

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