

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:PUTTUR (AUTONOMOUS)

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OUESTION BANK (DESCRIPTIVE)

Subject with Code: AT&CD (20CS0903) Course & Branch: B.Tech – CSM,CIC,CAI

Year &Sem: III-B.Tech & I-Sem Regulation: R20

<u>UNIT –I</u> FINITE AUTOMATA AND REGULAR LANGUAGES

| 1 | a | Consider the below | finite autor | nata and chec | ck whether t | the strings are | [L1][CO1] | [8M] |
|---|---|----------------------|----------------|-------------------|--------------|-------------------|-----------|------|
| | | accepted or not | [21][001] | [01/1] | | | | |
| | | · | States | Input Al | phabtes |] | | |
| | | | (Q) | 0 | 1 | | | |
| | | | ->q0 | q1 | q3 | | | |
| | | | q1 | q0 | q2 | | | |
| | | | (q2) | q3 | q1 | | | |
| | | | q3 | q2 | q0 | | | |
| | | (i) 0001 (ii |) 1010 | (iii) 1001 | (iv)010 | 1 | | |
| | b | Define alphabets, st | rings, Lang | uages? | | | [L3][CO1] | [4M] |
| 2 | a | Compare DFA and | | | | | [L2][CO1] | [4M] |
| | b | Construct DFA for th | e given NFA | | | | [L6][CO2] | [8M] |
| | | 0 | Next state | | | | | |
| | | → q0 q0,q1 | q0 | | | | | |
| | | q1 q2 | q 1 | | | | | |
| | | q2 q3 | q3 | | | | | |
| | | (q3) | q2 | | | | | |
| 3 | a | Write the process of | | from NEA | with a mayo | os to DEA | [L4][CO3] | [4M] |
| | b | Convert the followi | | | | S to DIA. | [L4][CO3] | [8M] |
| | | | ng 14171 wh | a a | D171. | | [L0][C02] | |
| | | | \mathcal{L} | \wedge | | | | |
| | | \rightarrow | q0 € | →(q1)- | € (q2 | 2 | | |
| | | | | | a | | | |
| | | | | k |) | | | |
| 4 | a | Write the process of | f equivalenc | ce two FA's? | | | [L4][CO3] | [4M] |
| | | | | | | | | |
| | b | Compare the equiva | alence two I | FA's or not. | | | [L4][CO3] | [8M] |
| | | c | d | | d | _ | | |
| | | (q ₁) | q ₃ | (q ₄) | | (q ₇) | | |
| | | | 2 | | | \uparrow | | |
| | | d d | | d | d | С | | |
| | | q_2 | | (q _s) | | q _s | | |
| | | | | 45) | С | d | | |
| | | | | | | | | |

| 5 | a | Contrast Mealy machine and Moore machine. | | | | | | | [L4][CO1] | [6M] | |
|----|---|---|---------------|----------------|---------|-------|-----------|-----------|-----------|-----------|------|
| | b | Convert the following Mealy machine into its equivalent Moore | | | | | | [L3][CO2] | [6M] | | |
| | | machine. | | | | | | | | | |
| | | | | | | 1 | | | Ī | | |
| | | Present | | I/P=0 | | | | | | | |
| | | State | | Next State O/P | | | kt State | O/P | | | |
| | | \rightarrow A | | C 0 | | | В | 0 | | | |
| | | В | A | 1 | | | D | 0 | | | |
| | | С | В | 1 | | | A | 1 | | | |
| | | D | D | 1 | | | C | 0 | | | |
| 6 | a | Define Melay r | | | | | | | | [L3][CO1] | [6M] |
| | c | Construct Meal | y machine | correspon | ding to | Мо | ore mach | nine? | | [L3][CO2] | [6M] |
| | | | States | Next | States | | Output | | | | |
| | | | (Q) | I/P=0 | I/P= | 1 | Output | | | | |
| | | | → q1 | q1 | q2 | 2 | 0 | | | | |
| | | q2 q1 q3 0 | | | | | | | | | |
| | | | q3 | q1 | q3 | } | 1 | | | | |
| 7 | a | List out the ide | ntities of Re | egular exp | ression | 1. | | | | [L1][CO3] | [6M] |
| | b | From the identi | | | | | | | | [L3][CO3] | [6M] |
| | | i) 10+(1010)*[^+(1010)*]=10+(1010)* ii) (1+100*)+(1+100*)(0+10*)(0+10*)*-10*(0+10*)* | | | | | | | | | |
| | | ii) (1+100*)+(1+100*)(0+10*)(0+10*)*=10*(0+10*)* | | | | | | | | | |
| 8 | a | Prove R=Q+RF | | | | | TDI | | | [L3][CO3] | [4M] |
| | b | Construct RE | rom given | FA by us | ing Ar | aen's | i neorei | n. | | [L6][CO3] | [8M] |
| | | | | | Å. | | \bigcap | | | | |
| | | q_0 q_1 q_2 | | | | | | | | | |
| | | | | | | | | | | | |
| | | 1 0 | | | | | | | | | |
| | | d3) | | | | | | | | | |
| | | | | | | | | | | | |
| | | 0, 1 | | | | | | | | | |
| 9 | a | State Pumping lemma for regular languages. | | | | | [L1][CO3] | [4M] | | | |
| | b | Prove that $L = \{a^ib^i \mid i \ge 0\}$ is not regular | | | | | [L3][CO3] | [8M] | | | |
| 10 | a | Give the Closure properties of Regular Sets | | | | | [L1][CO2] | [6M] | | | |
| | b | What are the applications of Pumping Lemma? | | | | | | [L1][CO3] | [6M] | | |

<u>UNIT -II</u> <u>CONTEXT FREE GRAMMAR AND TURING MACHINE</u>

| b Define the following terms: Useless symbol | 1 | a | Analyze and explain with example of | [L4][CO1] | [6M] | | | | |
|--|----|---|--------------------------------------|--------------------------------|------------|---------------|--|--|--|
| Si Null production iii) Unit productions 2 a Describe what is meant by Simplifying the Grammar. [L2] CO4 [4M] b Evaluate simplification of the following context free grammar. [L5] CO4 [8M] B → a/bc C → a / c C → | | b | Define the following terms: | [L1][CO4] | [6M] | | | | |
| iii) Unit productions | | | | | | | | | |
| 2 a Describe what is meant by Simplifying the Grammar. [L2] CO4] [4M] b Evaluate simplification of the following context free grammar. [L5] CO4] [8M] B → a/bc C → a / € | | | | | | | | | |
| b Evaluate simplification of the following context free grammar. S → Aa /B B → a/bc C → a / ε Interpret simplification of the given grammar. Simplify the following CFG S → aSb S → A A→cAd A→cd 4 a Remove the unit production from the grammar S → AB A → E B → C C → D D → b E → a b Remove ε productons from the grammar S → ABaC A→BC B → b/ε C C→D/ε D → d 5 a Write the process adapted to convert the grammar into CNF? [L3][CO4] [6M] S → bA/aB A → bA/aS/a B → aBB/bS/a. 6 a State Pumping lemma for Context-free language b Show that L = {a^nb^nc^n}, where n>=1} is not context free. a State Turing machine. b Construct a TM for regular Expression 01(00+11)(0+1)*1. L6][CO6] [8M] b Explain the various types of Turing machine. b Find the PCP solution for the following sets. A B 10 100 0 100 100 0 100 100 0 | | | , 1 | FX 635 GO 43 | | | | | |
| S → Aa /B B → a/bc C → a / ε | 2 | | | | | | | | |
| B → a/bc C → a / ∈ | | b | * | ving context free grammar. | [L5][CO4] | [8M] | | | |
| C→ a / ε Interpret simplification of the given grammar. Simplify the following CFG S→ aSb S→A A→cAd A→cd | | | | | | | | | |
| Interpret simplification of the given grammar. Simplify the following CFG S → aSb S → A A → cAd A → cd A → cd A → cd A → cmove the unit production from the grammar S → AB A → E B → C C → D D → b E → a B → c C → D D → b E → a B → c C → D D D D D D D D D D D D D D D D D D | | | | | | | | | |
| CFG S → aSb S → A A → cAd A → cAd A → cAd A → cAd [L3][CO4] [6M] 4 a Remove the unit production from the grammar S → ABA A → cAd [L3][CO4] [6M] b Remove ε productons from the grammar into S → ABC B → b/ε C → D/ε D → d [L3][CO4] [6M] 5 a Write the process adapted to convert the grammar into CNF? [L2][CO4] [4M] b Convert the following grammar into CNF. [L3][CO4] [8M] S → bA/aB A → bAA/aS/a B → aBB/bS/a. [L1][CO4] [4M] 6 a State Pumping lemma for Context-free language [L1][CO4] [4M] b Show that L = {a^nb^nc^n , where n>=1} is not context free. [L3][CO4] [8M] 7 a State Turing machine. [L1][CO6] [4M] b Construct a TM for regular Expression 01(00+11)(0+1)*1. [L6][CO6] [8M] 8 Explain the various types of Turing machine. [L2][CO6] [12M] 9 a Differentiate PCP solution for the following sets. [L5][CO6] [8M] | 3 | | | | | | | | |
| S → aSb S → A A → cAd A → cd 4 a Remove the unit production from the grammar S → AB A → E B → C C → D D → b E → a b Remove ∈ productons from the grammar S → ABaC A → BC B → b ← C → D/€ D → d 5 a Write the process adapted to convert the grammar into CNF? [L2][CO4] [8M] b Convert the following grammar into CNF. [L3][CO4] [8M] S → bA/aB A → bA/aS/a B → aBB/bS/a. 6 a State Pumping lemma for Context-free language [L1][CO4] [8M] b Show that L = {a^nb^nc^n}, where n>=1} is not context free. [L3][CO4] [8M] 7 a State Turing machine. [L1][CO6] [4M] b Construct a TM for regular Expression 01(00+11)(0+1)*1. [L6][CO6] [8M] 8 Explain the various types of Turing machine. [L2][CO6] [12M] 9 a Differentiate PCP and MPCP. [L4][CO6] [4M] b Find the PCP solution for the following sets. [L5][CO6] [8M] 10 101 01 100 0 10 0 10 10 100 10 100 10 100 10 100 10 100 10 100 10 100 10 100 10 100 10 100 10 100 10 100 10 1 | | | | grammar. Simping the following | | [] | | | |
| 4 a Remove the unit production from the grammar S→AB A→E B→C C→D D→b E→a [L3][CO4] [6M] b Remove ε productons from the grammar S→ABaC A→BC B→b/ε C→D/ε D→d [L3][CO4] [6M] 5 a Write the process adapted to convert the grammar into CNF? [L2][CO4] [4M] b Convert the following grammar into CNF. [L3][CO4] [8M] S→bA/aB A→bAA/aS/a B→aBB/bS/a. [L3][CO4] [4M] 6 a State Pumping lemma for Context-free language b Show that L = {a^nb^nc^n, where n>=1} is not context free. [L3][CO4] [8M] 7 a State Turing machine. [L1][CO6] [4M] b Construct a TM for regular Expression 01(00+11)(0+1)*1. [L6][CO6] [8M] 8 Explain the various types of Turing machine. [L2][CO6] [12M] 9 a Differentiate PCP and MPCP. [L4][CO6] [4M] b Find the PCP solution for the following sets. [L5][CO6] [8M] A B 10 101 10 100 0 10 10 0 101 0 10 10 a State the formal of PDA. [L1][CO5] [4M] b Construct an equivalent PDA for the following CFG. [L6][CO5] [8M] | | | | > cd | | | | | |
| S→AB A→E B→C C→D D→b E→a | 1 | 9 | | | [I 3][CO4] | [6M] | | | |
| b Remove ε productons from the grammar S → ABaC A → BC B → b/ ε C → D/ε D → d 5 a Write the process adapted to convert the grammar into CNF? [L2][CO4] [4M] b Convert the following grammar into CNF. S → bA/AB A → bA/As/as/a B → aBB/bS/a. 6 a State Pumping lemma for Context-free language [L1][CO4] [4M] b Show that L = {a^nb^nc^n}, where n>=1} is not context free. [L3][CO4] [8M] 7 a State Turing machine. [L1][CO6] [4M] b Construct a TM for regular Expression 01(00+11)(0+1)*1. [L6][CO6] [8M] 8 Explain the various types of Turing machine. [L2][CO6] [12M] 9 a Differentiate PCP and MPCP. [L4][CO6] [4M] b Find the PCP solution for the following sets. A B 10 101 01 100 0 10 0 10 100 | - | a | - | _ | | [OIVI] | | | |
| S → ABaC A → BC B → b/ € C → D/€ D → d 5 a Write the process adapted to convert the grammar into CNF? [L2][CO4] [4M] b Convert the following grammar into CNF. [L3][CO4] [8M] S → bA/AB A → bAA/aS/a B → aBB/bS/a. [L1][CO4] [4M] 6 a State Pumping lemma for Context-free language [L1][CO4] [4M] b Show that L = {a^nb^nc^n}, where n>=1} is not context free. [L3][CO4] [8M] 7 a State Turing machine. [L1][CO6] [4M] b Construct a TM for regular Expression 01(00+11)(0+1)*1. [L6][CO6] [8M] 8 Explain the various types of Turing machine. [L2][CO6] [12M] 9 a Differentiate PCP and MPCP. [L4][CO6] [4M] b Find the PCP solution for the following sets. [L5][CO6] [8M] A B 10 100 100 100 100 100 100 100 100 100 100 100 100 <t< td=""><td></td><td>h</td><td></td><td></td><td>[I 2][CO4]</td><td>[6M]</td></t<> | | h | | | [I 2][CO4] | [6M] | | | |
| 5 a Write the process adapted to convert the grammar into CNF? [L2][CO4] [4M] b Convert the following grammar into CNF. [L3][CO4] [8M] S → bA/aB A → bAA/aS/a B → aBB/bS/a. [L1][CO4] [4M] 6 a State Pumping lemma for Context-free language [L1][CO4] [4M] b Show that L = {a^nb^nc^n}, where n>=1} is not context free. [L3][CO4] [8M] 7 a State Turing machine. [L1][CO6] [4M] b Construct a TM for regular Expression 01(00+11)(0+1)*1. [L6][CO6] [8M] 8 Explain the various types of Turing machine. [L2][CO6] [12M] 9 a Differentiate PCP and MPCP. [L4][CO6] [4M] b Find the PCP solution for the following sets. [L5][CO6] [8M] A B [L5][CO6] [8M] 10 100 0 0 1 0 1 010 100 0 1 10 a State the formal of PDA. [L1][CO5] [4M] b Construct an equivalent PDA for the following CFG. [L6 | | U | | | [L3][CO4] | [OIVI] | | | |
| b Convert the following grammar into CNF. S→ bA/aB A→bAA/aS/a B→aBB/bS/a. [L3][CO4] [8M] b State Pumping lemma for Context-free language [L1][CO4] [4M] b Show that L = {a^nb^nc^n , where n>=1} is not context free. [L3][CO4] [8M] 7 a State Turing machine. [L1][CO6] [4M] b Construct a TM for regular Expression 01(00+11)(0+1)*1. [L6][CO6] [8M] 8 Explain the various types of Turing machine. [L2][CO6] [12M] 9 a Differentiate PCP and MPCP. [L4][CO6] [4M] b Find the PCP solution for the following sets. [L5][CO6] [8M] | 5 | а | | | [I 2][CO4] | [4 M] | | | |
| S→ bA/aB A→bAA/aS/a B→aBB/bS/a. S→abB/bS/a. [L1][CO4] [4M] 6 a State Pumping lemma for Context-free language [L1][CO4] [8M] 7 a State Turing machine. [L3][CO4] [8M] 8 Explain the various types of Turing machine. [L1][CO6] [4M] 9 a Differentiate PCP and MPCP. [L4][CO6] [4M] b Find the PCP solution for the following sets. [L5][CO6] [8M] A B 10 101 0 10 100 [L5][CO6] [8M] 10 20 100 [L5][CO6] [4M] 10 3 State the formal of PDA. [L1][CO5] [4M] b Construct an equivalent PDA for the following CFG. [L6][CO5] [8M] | | | | | | | | | |
| A→bAA/aS/a B→aBB/bS/a. [L1][CO4] [4M] 6 a State Pumping lemma for Context-free language [L1][CO4] [4M] b Show that L = {a ⁿ b ⁿ c ⁿ , where n>=1} is not context free. [L3][CO4] [8M] 7 a State Turing machine. [L1][CO6] [4M] b Construct a TM for regular Expression 01(00+11)(0+1)*1. [L6][CO6] [8M] 8 Explain the various types of Turing machine. [L2][CO6] [12M] 9 a Differentiate PCP and MPCP. [L4][CO6] [4M] b Find the PCP solution for the following sets. [L5][CO6] [8M] A B 10 101 0 10 100 [8M] 10 a 100 0 10 10 a State the formal of PDA. [L1][CO5] [4M] b Construct an equivalent PDA for the following CFG. [L6][CO5] [8M] | | | 0.0 | , et a . | | [01/1] | | | |
| 6 a State Pumping lemma for Context-free language [L1][CO4] [4M] b Show that L = {a^nb^nc^n}, where n>=1} is not context free. [L3][CO4] [8M] 7 a State Turing machine. [L1][CO6] [4M] b Construct a TM for regular Expression 01(00+11)(0+1)*1. [L6][CO6] [8M] 8 Explain the various types of Turing machine. [L2][CO6] [12M] 9 a Differentiate PCP and MPCP. [L4][CO6] [4M] b Find the PCP solution for the following sets. [L5][CO6] [8M] A B [L5][CO6] [8M] 10 100 0 0 10 100 100 0 1 10 a State the formal of PDA. [L1][CO5] [4M] b Construct an equivalent PDA for the following CFG. S→aAB bBA A→bS a [L6][CO5] [8M] | | | | | | | | | |
| b Show that L = {a^nb^nc^n}, where n>=1} is not context free. [L3][CO4] [8M] 7 a State Turing machine. [L1][CO6] [4M] b Construct a TM for regular Expression 01(00+11)(0+1)*1. [L6][CO6] [8M] 8 Explain the various types of Turing machine. [L2][CO6] [12M] 9 a Differentiate PCP and MPCP. [L4][CO6] [4M] b Find the PCP solution for the following sets. [L5][CO6] [8M] A B 10 101 0 10 100 0 100 0 0 0 10 a State the formal of PDA. [L1][CO5] [4M] b Construct an equivalent PDA for the following CFG. [L6][CO5] [8M] S→aAB bBA [L6][CO5] [8M] | | | B→aBB/bS/a. | | | | | | |
| 7 a State Turing machine. [L1][C06] [4M] b Construct a TM for regular Expression 01(00+11)(0+1)*1. [L6][C06] [8M] 8 Explain the various types of Turing machine. [L2][C06] [12M] 9 a Differentiate PCP and MPCP. [L4][C06] [4M] b Find the PCP solution for the following sets. [L5][C06] [8M] A B 10 101 01 100 100 0 0 10 100 0 10 a State the formal of PDA. [L1][C05] [4M] b Construct an equivalent PDA for the following CFG. [L6][C05] [8M] S→aAB bBA A→bS a [L6][C05] [8M] | 6 | | | | | | | | |
| b Construct a TM for regular Expression 01(00+11)(0+1)*1. | | b | | } is not context free. | _ | | | | |
| 8 Explain the various types of Turing machine. [L2][CO6] [12M] 9 a Differentiate PCP and MPCP. [L4][CO6] [4M] b Find the PCP solution for the following sets. [L5][CO6] [8M] A B [L5][CO6] [8M] 0 101 100 0 100 0 0 0 10 100 0 0 10 2 2 3 10 3 4 4 4 10 4 4 4 4 4 4 10 5 6 7 6 6 7 6 7 6 7 7 7 7 | 7 | 1 | | | | | | | |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | b | | | | | | | |
| $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | | | machine. | | | | | |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | 9 | a | | | | | | | |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | b | Find the PCP solution for the follow | ving sets. | [L5][CO6] | [8M] | | | |
| $ \begin{array}{ c c c c c c }\hline 0 & 100 \\ \hline 0 & 10 \\ \hline 100 & 0 \\ \hline 1 & 010 \\ \hline \\\hline 10 & a & State the formal of PDA. \\ \hline b & Construct an equivalent PDA for the following CFG. \\ S \rightarrow aAB \mid bBA \\ A \rightarrow bS \mid a \\ \hline \end{array} \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | | A | В | | | | | |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | | 10 | 101 | | | | | |
| $ \begin{array}{ c c c c c c } \hline 100 & 0 \\ \hline 1 & 010 \\ \hline \hline 10 & a & State the formal of PDA. \\ \hline b & Construct an equivalent PDA for the following CFG. \\ S \rightarrow aAB \mid bBA \\ A \rightarrow bS \mid a \\ \hline \end{array} \begin{array}{ c c c c c } \hline 100 & 0 \\ \hline \hline 1 & 010 \\ \hline \hline \hline 10 & a & State the formal of PDA. \\ \hline \hline \hline [L1][CO5] & [4M] \\ \hline \hline [L6][CO5] & [8M] \\ \hline \hline \hline \hline \\ \hline \hline \\ \hline \end{array} $ | | | 01 | 100 | | | | | |
| 1 010 10 a State the formal of PDA. [L1][CO5] [4M] b Construct an equivalent PDA for the following CFG. S→aAB bBA A→bS a [L6][CO5] [8M] | | | 0 | 10 | | | | | |
| 10 a State the formal of PDA. [L1][CO5] [4M] b Construct an equivalent PDA for the following CFG. S→aAB bBA A→bS a [L6][CO5] [8M] | | | 100 | 0 | | | | | |
| b Construct an equivalent PDA for the following CFG. S→aAB bBA A→bS a [L6][CO5] [8M] | | | 1 | 010 | | | | | |
| b Construct an equivalent PDA for the following CFG. S→aAB bBA A→bS a [L6][CO5] [8M] | 10 | a | State the formal of PDA. | [L1][CO5] | [4M] | | | | |
| S→aAB bBA | | b | Construct an equivalent PDA for | | | | | | |
| A→bS a | | | | | | | | | |
| B→aS b. | | | | | | | | | |
| | | | • | | | | | | |



<u>UNIT -III</u> <u>LEXICAL ANALYSIS AND TOP DOWN PARSING</u>

| 1 | | Explain the phases of a compiler with neat diagram. | [L2][CO2] | [12M] |
|----|---|--|--------------|---------|
| 2 | a | Explain in detail about the role of lexical analyzer in Compiler Design. | [L2][CO1] | [6M] |
| | b | Write about input buffering? | [L3][CO1] | [6M] |
| 2 | | | [L2][CO3] | |
| 3 | a | Explain LEX Tool with the structure of Lex Program? | | [8M] |
| | b | Illustrate Application of compiler technology | | [4M] |
| 4 | a | The state of the s | | [4M] |
| | b | Construct Leftmost and Rightmost derivation and derivation tree for | [L6][CO4] | [8M] |
| | | the string 0100110 | | |
| | | S→0S/1AA | | |
| | | A→0/1A/0B | | |
| | | B→1/0BB | | |
| 5 | a | Describe the procedure of eliminating Left recursion. | [L1][CO1] | [6M] |
| | b | Eliminate left recursion for the following grammar | [L5][CO1] | [6M] |
| | | E→E+T/T | | |
| | | T→T*F/F | | |
| | | F→(E)/id | | |
| 6 | a | Explain Left recursion and Left factoring. | [L2][CO1] | [6M] |
| | b | Perform left factor for the grammar A→abB/aB/cdg/cdeB/cdfB | [L3][CO4] | [6M] |
| 7 | a | Describe the role of Compiler | [L1][CO1] | [4M] |
| | b | Design the recursive decent parser for the following grammar? | [L6][CO3] | [8M] |
| | | E→E+T/T | | |
| | | T→T*F/F | | |
| | | F→(E)/id | FF 211 CO 11 | F 43 47 |
| 8 | a | Illustrate the rules to be followed in finding the FIRST and FOLLOW. | [L3][CO1] | [4M] |
| | b | Find FIRST and FOLLOW for the following grammar? $E \rightarrow E+T/T$ $T \rightarrow T*F/F$ $F \rightarrow (E)/id$ | [L3][CO2] | [8M] |
| 9 | | Consider the grammar $E \rightarrow E + T/T$, $T \rightarrow T*F/F$, $F \rightarrow (E) id$ | [L6][CO3] | [12M] |
| | | Design predictive parsing table and check given grammar is LL(1) | | |
| | | Grammar or not? | | |
| 10 | | Consider the grammar $E \rightarrow TE^1$ | [L4][CO2] | [12M] |
| | | $E^{1} \rightarrow +TE^{1} -TE^{1} \varepsilon$ | | |
| | | $T \rightarrow FT^1$ | | |
| | | $T^1 \rightarrow *FT^1 / FT^1 \varepsilon$ | | |
| | | $F \rightarrow GG^1$ | | |
| | | $G^1 \rightarrow ^{\wedge} F / \varepsilon$ | | |
| | | G→(E)/id | | |
| | | Calculate FIRST and FOLLOW for the above grammar | | |
| | | | | |

<u>UNIT -IV</u> BOTTOM-UP PARSING AND SEMANTIC ANANLYSIS

| 1 | a | Explain about handle pruning | [L2][CO1] | [6M] |
|----|---|---|----------------|------------------|
| | b | Summarize about SLR parsing | [L2][CO1] | [6M] |
| 2 | a | Describe bottom up parsing | [L1][CO2] | [4M] |
| | b | Differences between SLR,CLR, LALR parsers | [L4][CO2] | [8M] |
| 3 | | Prepare Shift Reduce Parsing for the input string using the grammar | [L6][CO3] | [12M] |
| | | $S \rightarrow (L) a$ | | |
| | | L→L,S S | | |
| | | a)(a,(a,a)) | | |
| | | b)(a,a) | | |
| 4 | a | Define augmented grammar. | [L1][CO2] | [2M] |
| | b | Construct the LR(0) items for the following Grammar | [L6][CO3] | [10 M] |
| | | S→L=R | | |
| | | S→R | | |
| | | L→*R | | |
| | | L→id | | |
| 5 | | R→L Construct CLR Parsing table for the given grammar | [] (][(((()))] | [1 2] [1] |
| 3 | | S-CC | [L6][CO3] | [12 M] |
| | | C→aC/d | | |
| 6 | | Design the LALR parser for the following Grammar | [L6][CO3] | [12M] |
| | | $S \rightarrow AA$ | | |
| | | $A \rightarrow aA$ | | |
| | | A →b | | |
| 7 | a | Define YACC parser in Syntax Analysis. | [L1][CO3] | [2M] |
| | b | Explain in detail about YACC Parser generator tool. | [L2][CO3] | [10 M] |
| 8 | a | Explain syntax directed definition with simple examples | [L2][CO2] | [6M] |
| | b | Describe in detail the Translation scheme of SDD. | [L2][CO2] | [6M] |
| 9 | a | Define a syntax-directed translation and explain with example. | [L2][CO2] | [6M] |
| | b | Give the evaluation order of SDT with an example. | [L5][CO2] | [6M] |
| 10 | | Discuss Type Checking with suitable examples. | [L2][CO4] | [12M] |



<u>UNIT -V</u> CODE OPTIMIZATION AND CODE GENERATION

| 1 | | Analyse different types of Intermediate Code with an example. | [L4][CO5] | [12M] |
|----|---|---|-----------|--------|
| 2 | | Explain Representation of Three Address Codes with suitable Examples | [L2][CO5] | [12M] |
| 3 | | Produce quadruple, triples and indirect triples for following expression: $(x + y) * (y + z) + (x + y + z)$ | [L6][CO5] | [12M] |
| 4 | a | Discuss function preserving transformations. | | [6M] |
| | b | Describe about loop optimization technique . | [L2][CO5] | [6M] |
| 5 | | Explain the peephole optimization Technique with examples. | [L2][CO5] | [12M] |
| 6 | a | Define and Show Dead-code elimination with example. | [L1][CO4] | [6M] |
| | b | List and explain the Issues in the design of a code generator | [L2][CO6] | [6M] |
| 7 | a | Analyse the different forms in target program. | [L4][CO6] | [6M] |
| | b | Explain the target machine in code generator. | [L2][CO6] | [6M] |
| 8 | a | Define flow Graph | [L1][CO4] | [2M] |
| | b | Interpret optimization techniques on Basic Blocks with simple examples? | [L3][CO5] | [10M] |
| 9 | a | Analyze Simple code generator | [L4][CO6] | [6M] |
| | b | Evaluate Register allocation and register assignment techniques. | [L5][CO6] | [6M] |
| 10 | a | Create the DAG for following statement. a+b*c+d+b*c | [L6][CO6] | [4M] |
| | | | | |
| | b | Construct the DAG for the following basic blocks | [L6][CO6] | [8M] |
| | | 1. t1:=4*i | [Lo][Coo] | [OIVI] |
| | | 2. t2:=a[t1] | | |
| | | 3. t3:=4*i | | |
| | | 4. t4:=b[t3] | | |
| | | 5. t5:=t2*t4 | | |
| | | 6. t6:=prod+t5 | | |
| | | 7. prod:=t6 | | |
| | | 8. t7:=i+1 | | |
| | | 9. i:=t7 | | |
| | | if $i <= 20$ goto 1 | | |

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