|       | L.                           |                                    |
|-------|------------------------------|------------------------------------|
| 81    | consider the following man   | max S→as ashs E Show               |
|       | that derivation for string a | ah is ambiguous                    |
| Ony 1 | By Leftmost derivation:      |                                    |
|       | 1) s = asbs (s-asbs)         | 2) S - a S - ( S - a S)            |
| -0    | → nasbs (s-as)               | ⇒ aasbs (s-asbs)                   |
|       | => aansl(s+e) ?              | MCLAGOS (STE)                      |
|       | => aab (s→E)                 | (S→E) =) aab (S→E)                 |
|       |                              | g "aab in more than one way,       |
|       | . The given grammer is ar    | abiguous.                          |
|       | 0 0                          |                                    |
| Q2    | simplify the given gramma    | : 5-) a A a   b B b   BB , A -> C, |
|       | • 5                          | BA A SE C - SE                     |
| an 2" | Step 1: Elimination of Mull  | Production                         |
|       | Productions (P)              | New Production (NP)                |
|       | S-) QAQ                      | Sinaa                              |
|       | S→ bBb                       | S766                               |
|       | S → BB                       | S+B, S+E                           |
|       | A → C                        | 3 ← A                              |
|       | BTA                          | 8→8                                |
|       | B-1S                         | BYE                                |
|       | C→S                          | C + E                              |
|       | C-18                         |                                    |
|       |                              |                                    |
|       | P+NP: S-aAalaa BBI           | 0Bb   bb   B   E                   |
|       | ATCLE                        |                                    |
|       | B-AIEIS                      |                                    |
|       | C-) SIE                      |                                    |
|       | Delete all ruel production   | ons, we get                        |
|       | I.                           | V                                  |

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|-----------|---------------------------------|-------------------------------|-----|
|           | S - a Aa   aa   bBb   bb   BB   | В                             |     |
|           | A -> C                          |                               |     |
|           | BALS                            |                               | -   |
|           | C→S                             |                               |     |
|           |                                 |                               |     |
|           | Step 2: Elimination of unit &   | roductions                    |     |
|           | Production (P)                  | New Production (NP)           |     |
|           | Stata                           |                               |     |
| 6         | S+bBb                           | 1                             |     |
|           | S-aa                            | 7                             |     |
|           | S - bb                          |                               | _\$ |
|           | 3 + BB                          |                               |     |
|           | S -> B                          |                               |     |
|           | A→ C                            | A-) aAa aa bb PbBb            |     |
|           | B → A                           | B→aAalbblaalbBb BB B          |     |
|           | BAS                             | B-a AalbblaalbBb   BB   B     |     |
|           | C→S                             | C JaAa aa bBb bb BBB          |     |
| 11        |                                 |                               |     |
|           | PHNP: ST analaa 188   bBb       |                               |     |
|           | A- analaalbablbb                |                               |     |
|           | B+ analaalbbblbb!               |                               |     |
| - Annuare | C→ aAalaalbBb  tabb             |                               | 1)  |
|           | Delete all unit productions     |                               |     |
|           | S + a Aa  aa   BB   bB b   1    |                               |     |
| 11-       | A - a Aa laal b B b l b b l B s |                               |     |
| 131-      | B 7 aAa   aa   bbb   bb   E     |                               |     |
|           | C - aAalaa   bBb   bb   B       | B                             |     |
|           | 212-0-50                        | . 0.                          |     |
|           | Step 3: Elimination of useless  | productions.                  |     |
|           | since variable C is not read    | hable from state 5, hence it. | W   |
|           | a useless production            |                               |     |
|           | : Simplified Grammas:           | S-aAa aa lbBb bb BB           |     |
|           |                                 | A - aAa aa bBb bb BB          |     |
|           |                                 | B-) aAa   aa   bBb   bb   BB  |     |
|           |                                 |                               |     |

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| .00   | Date:  |  |
|-------|--|--|
| 40    | Generate and reduce the grammar for the following to CNF:  L={a^b}^c   n>=1, m>=1 } over == {a,b,c}.   |  |
| Jan 2 | L= [anbmcn   n>=1, m>=1 y over == [a,b,c]  |  |
| ZMM S | Here, the logic is equal no of a's followed by no of b's dependent on m and equal no of c's. Therefore, the grammar is:    S - aSc   axc   : G = (V, T, P, S)     X -> b xb   : G = (\xi S, x\cdot Y, \xi a, b, c\cdot Y, \xi S - asc   axc,   |  |
|       | on m and equal no of c's. Therefore the grammas is:  |  |
|       | $S \rightarrow aSc   axc   G = (V, T, P, S)$   |  |
|       | -X -> b xb : G = (85, x y, 8a, b, c y, 85 -> asc axc,  |  |
|       | X / D XID 11   |  |
|       | Convert to CNF:  |  |
|       | Step 1: Simplification of grammar  |  |
|       | Mull productions as there are no new productions, the grown mor  |  |
|       | stays as it is after removal of nucl productions, ie   |  |
|       | S-BSCIANC 8XAPREHOR  |  |
|       | Unit amoducial and an amount of the state of |  |
|       | Unit productions: as these are no unit productions, the grammar  |  |
|       | Starp as it is after removal of unit productions, i.e.   |  |
|       | 3 Justifica, 53 bx 16  |  |
|       | Useless productions are variables are reachable from start state S   |  |
|       | therefore no useless productions present : mammer is:  |  |
|       | S + asclaxe, x - bx/b  |  |
|       |  |  |
|       | Step 2: Conversion to CNF  |  |
|       | first, usite all productions already in CNF  |  |
|       | $\times \rightarrow b$   |  |
|       | stasc, Gta and Cotc.   |  |
|       | : S → C,SC2  |  |
|       | C3 → 3C2   |  |
|       | : S → C, C3  |  |
|       |  |  |
|       | S-axc X-18X  |  |
|       | S-C1XC2 C5-76h   |  |
|       | C4-1XC2  |  |
|       | : S-JCICY  |  |
|       |  |  |

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|         | Date:  |
|---------|--|
|         | : CNF is   S - C, C3   C, C4   |
|         | $X \rightarrow C_5 \times  b $   |
|         | $C_1 \rightarrow Q$  |
|         | $C_2 \rightarrow C$  |
|         | $C_3 \rightarrow SC_2$   |
|         | $C_4 \rightarrow X_{C2}$   |
|         | C5-16  |
| D.L.    | Co   |
| ans 4   | Convert the following into GNF: 5-AA O, A-SS 1   |
| COTTA T |  |
|         | The Court of the C |
|         | After elimination of rule productions, S-1 AA 10   |
| 1       | A-1 SS   1   |
| HT      | Unit andustices (1)  |
|         | Unit productions : No unit productions present in grammar Grammar is : S-1 AA 10   |
|         | A T SS I I   |
|         | H 133  |
|         | Useless productions: All variables are reachable from start  |
|         | state 5.   |
|         | : Simplified grammar in : S- AA 10   |
| -       | A-SSII   |
| - 1     | νν   |
| 100     | Step 2 : Conversion to GNF   |
|         | A 7 SS II  |
|         | By substitution we get   |
|         | ATASIOSII  |
|         | By substitution we get  A > A A S   O S      A × B B 2   |
|         |  |
| -\@U    | After replacement, By rule 2   |
| 7.4     | B - d, ld, B   |
|         | ie B - AS ASB - (I)  |
|         | and A -> BilBiB  |
|         | ie A - OS OSB   B   1 - CT)  |

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|-----------------|---|
| Alter           | Date:                                       |
| 1 200           | substitution in S                           |
| 5-              | PAAID                                       |
| : S             | -OSA OSBA 11A 11BA 10                       |
|                 | 1     |
| Substi          | tute A in B                                 |
| B -> 0          | and Am B                                    |
|                 | SS OSBS   IBS   IS OSBB   OSBSB   IBSB   IS |
| B->0            | 0 22  |
| $A \rightarrow$ | OS/OSB/1/1B                                 |
|                 |   |
|                 | sm sm                                       |
| 1               |   |
| -               |   |
| II              |   |