**Please read the following instructions carefully before solving & submitting assignment:**

**Uploading Instructions:**

* You are supposed to consult recommended book/s to clarify your concepts as handouts are not sufficient.
* The assignment file must be an MS Word file. Any other software/tool is not allowed.
* The required file format is **.doc** or **.docx**. Any other format like scan images, txt, pdf, png or jpeg etc. will not be accepted.
* This assignment consists of one question only. So, attempt it and place your solution in a single MS Word file along with your own **Student Id** at top.
* Submit the MS Word file at VULMS within the due date.

**Rules for Marking:**

It should be cleared that your assignment will not get any credit if:

* The assignment is submitted after due date.
* The assignment is not submitted in .doc or .docx format.
* The submitted assignment does not open or file is corrupt.
* The assignment is fully or partially copied from other student or ditto copy from handouts or Internet; strict disciplinary action will be taken in this case.
* The submitted file does not contain your own Student Id, or contain other than yours; Zero Marks will be awarded, and no excuse will be accepted in any case.

**Note:**

* No assignment will be accepted after the due date via email in any case (*whether it is the case of load shedding or internet malfunctioning etc.*). Hence refrain from uploading assignment in the last hour of deadline.
* It is recommended to upload solution file at least one day before its closing date.
* Do not put any query on MDB regarding this assignment, if you have any query then email at [cs606@vu.edu.pk](mailto:cs606@vu.edu.pk)

**Lectures Covered:**

* This assignment covers Lectures # 19 to 30.**Question Marks: 20**

Consider the following canonical collection of LR(1) items for a typical grammar;

|  |  |  |
| --- | --- | --- |
| Goto | State | Closure |
|  | 0 | {  [S → •A, $]  [A → •B C D E, $]  [B → •C D E, e]  [C → •D E, e]  [D → •E, e]  [E → •e, e]  } |
| goto(0, A) | 1 | {  [S → A•, $]  } |
| goto(0, B) | 2 | {  [A → B•C D E, $]  [C → •D E, e]  [D → •E, e]  [E → •e, e]  } |
| goto(0, C) | 3 | {  [B → C•D E, e]  [D → •E, e]  [E → •e, e]  } |
| goto(0, D) | 4 | {  [C → D•E, e]  [E → •e, e]  } |
| goto(0, E) | 5 | {  [D → E•, e]  } |
| goto(0, e) | 6 | {  [E → e•, e]  } |
| goto(2, C) | 7 | {  [A → B C•D E, $]  [D → •E, e]  [E → •e, e]  } |
| goto(2, D) | 4 |  |
| goto(2, E) | 5 |  |
| goto(2, e) | 6 |  |
| goto(3, D) | 8 | {  [B → C D•E, e]  [E → •e, e]  } |
| goto(3, E) | 5 |  |
| goto(3, e) | 6 |  |
| goto(4, E) | 9 | {  [C → D E•, e]  } |
| goto(4, e) | 6 |  |
| goto(7, D) | 10 | {  [A → B C D•E, $]  [E → •e, $]  } |
| goto(7, E) | 5 |  |
| goto(7, e) | 6 |  |
| goto(8, E) | 11 | {  [B → C D E•, e]  } |
| goto(8, e) | 6 |  |
| goto(10, E) | 12 | {  [A → B C D E•, $]  } |
| goto(10, e) | 13 | {  [E → e•, $]  } |

Table-1: Canonical Collection of LR(1) items

You are required to generate CLR(1) parsing table as shown below;

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **State** | **Action** | | **Goto** | | | | |
| **e** | **$** | **A** | **B** | **C** | **D** | **E** |
| **0** | ? | ? | ? | ? | ? | ? | ? |
| **1** | ? | ? | ? | ? | ? | ? | ? |
| **2** | ? | ? | ? | ? | ? | ? | ? |
| **3** | ? | ? | ? | ? | ? | ? | ? |
| **4** | ? | ? | ? | ? | ? | ? | ? |
| **5** | ? | ? | ? | ? | ? | ? | ? |
| **6** | ? | ? | ? | ? | ? | ? | ? |
| **7** | ? | ? | ? | ? | ? | ? | ? |
| **8** | ? | ? | ? | ? | ? | ? | ? |
| **9** | ? | ? | ? | ? | ? | ? | ? |
| **10** | ? | ? | ? | ? | ? | ? | ? |
| **11** | ? | ? | ? | ? | ? | ? | ? |
| **12** | ? | ? | ? | ? | ? | ? | ? |
| **13** | ? | ? | ? | ? | ? | ? | ? |

Table-2: CLR(1) Parsing Table

Good Luck