Grammar Exercise - Workshop 2

Let's say that we are trying to define string expressions for a new programming language.
The terminals are as follows:

1. **STRLIT** is a token ***string literal***.
2. **SID** is a token ***string identifier*** representing a name of a string variable or a name of a method returning a string value.
3. '[' is a token.
4. ']' is a token.
5. ':' is a token.
6. '(' is a token.
7. ')' is a token.
8. ',' is a token.
9. '+' is a token.

For simplicity's sake, we will treat the non-terminal ***iexpr*** as a terminal (i.e. we will not provide a definition for ***iexpr*** – which is representing an integer expression).

Given the following notation of string expressions below, give a Context-Free Unambiguous Grammar in Backus-Naur Form.

1. **STRLIT** is a string expression (meaning a string literal).
2. **SID** is a string expression (meaning a name of a string variable).
3. **SID()** is a string expression (meaning a call to a method returning a string value).
4. if X, X_1, ..., X_n are string expressions, then so are the following sentential forms:
   (a) **SID(** X_1 **)** represents a call to a method with one string argument returning a string value.
   (b) **SID(** X_1, X_2 **)** represents a call to a method with two string arguments returning a string value.
   (c) **SID(** X_1, X_2, X_3 **)** represents a call to a method with three string arguments returning a string value.
   (d) **SID(** X_1, ..., X_n **)** represents a call to a method with n string arguments returning a string value.
   (e) X**[iexpr]** represents the symbol of the value of X at position **iexpr**.
   (f) X**[iexpr**$_1$**:iexpr**$_2$**]** represents the symbol of the value of X at position **iexpr**$_1$ to position **iexpr**$_2$.
   (g) X**[:iexpr]** represents the prefix of the value of X from position 0 to position **iexpr**.
   (h) X**[iexpr:]** represents the suffix of the value of X from position **iexpr** to the end position.
   (i) X_1 + X_2 represents the concatenation of the value of X_1 with the value of X_2.