1. **Data envelopment analysis (DEA):**

A method based on linear programming used to assess the relative efficiency of operating units with the same goals and objectives. DEA allows us to measure the comparative efficiency with which operating units (e.g., coal mines) transform resources and/or environmental factors to useful outcomes.

2. **Nonparametric**

Nonparametric refers to the absence of a specific functional form for a production technology. In practice, nonparametric is often a short-hand expression for mathematical programming.

3. **Stochastic Production Frontier**

The stochastic production frontier gives the maximum flow of outputs in physical terms for quantity physical flows of the factors of production and specifically account for technical inefficiency. There are two error terms: (1) a random error term to account for stochastic noise and (2) an error term to specifically account for technical inefficiency.

4. **Technical Efficiency**

Technical efficiency occurs when the maximum amount of an output is produced for a given set of inputs (output-oriented technical efficiency) or when the minimum amount of inputs are required to produce a given output level (input-oriented technical efficiency).

5. **Variable Costs.**

Variable costs are the costs associated with the variable inputs (factors of production) used in the production of a particular output. Variable costs directly vary with the level of output produced. Variable
cost is obtained as the sum of the variable inputs measured in physical units multiplied by their respective prices.

6. Variable Inputs.
   Variable inputs are factors of production that can be freely varied in a time period and hence vary according to the amount of output produced.

7. Relative Efficiency
   A common measure for relative efficiency is,
   \[
   \text{Efficiency} = \frac{\text{Weighted sum of outputs}}{\text{Weight sum of inputs}}
   \]

8. Linear programming (LP)
   It is a mathematical method for determining a way to achieve the best outcome (such as maximum profit or lowest cost) in a given mathematical model for some list of requirements represented as linear equations.

9. SDL and LHD
   Subsequently side dump loaders (SDL) and load-haul-dumpers (LHD) which combine the operation of loading of coal at the face and transport by belt conveyors became available.

10. Coal
    Coal is a sedimentary rock formed from plants that flourished millions of years ago. Coal formation began during the Carboniferous Period (known as the first coal age), which spanned 360 million to 290 million years before present.

11. Open Cast Mine
    When coal seams are near the surface, it may be economical to extract the coal using open cut (also referred to as open cast, open pit, or strip) mining methods.

12. Under Round Mines
    Generally, coal more than 70 meters below the surface is mined by Underground methods.
13. **Productivity**
   It is a measure relating a quantity or quality of output to the inputs required to produce it.

14. **Productivity Measurement**
   Productivity = Output/Inputs (within time period, with quality considered).

15. **Output per man shift (OMS) in Coal mines**
   Productivity (OMS) = Tonnage of coal produced / Manpower x Shifts

16. **Benchmarking**
   Benchmarking is the process of comparing one's business processes and performance metrics to industry bests and/or best practices from other industries. Dimensions typically measured are quality, time, and cost.

17. **Cross Efficiency (CE)**
   Cross efficiency score of a DMU represents how well the unit is performing with respect to the optimal weights of another DMU.

18. **Scale Efficiency (SE)**
   This measure and tell us very little about whether a production unit is over- or undersized.

19. **Wage Cost (Input)**
   Cost of all the wages paid to the employees in coal mines.

20. **Store Cost (Input)**
   Cost of Explosives, spares and other maintenance items in coal mines.

21. **OBR cost (Input)**
   Cost of over burden removal from above coal seams

22. **Other cost (Input)**
   Cost of Capital equipment, Depreciation and sand-stowing.

23. **Production (output)**
   It is the Saleable Coal produced from mines.
24. Peer Count
The peer count means how many times efficient mines referred as a benchmark for other inefficient mines.

25. Peer Group
The set of efficient mines are allotted as the reference to the inefficient mines for improving efficiency.

26. Virtual Producers
The usage of combinations of efficient DMUs is called virtual producers corresponding to the inefficient ones. The "shadow values" and "peer group" are helpful in constructing the virtual producers.

27. Slack Variable
It is a variable that is added to a constraint to turn the inefficient into an efficient. As with the other variables in the unit, the slack variable cannot take on negative values, as the programme requires them to be positive or zero.

28. Input-orientation
In input orientation measure indicates how much the existing input to be reduced to produce a given level of output.

29. Output-orientation
In output orientation measure indicates how much the existing output to be increased to improve the efficiency.

30. Correlation
The correlation between the various rankings is to know the degree of association between various methods.