Function of Fluxes:

The functions of the different constituents of electrode coatings are:

1. Provide a protective neutral or reducing atmosphere.
2. Stabilize the arc by liberating electrons at relatively low temperature to ionize the arc gap before the metal melts.
3. Provide a slag of low melting point, sometimes nearly the same as base metal so that both melt at the same rate and the coating gasifying or melting completely.
4. Provide a slag of low density.
5. Provide a slag of low viscosity; it should not too viscous otherwise slag will be trapped in weld metal.
6. Make good the losses of metallic elements in the electrode by burning.
7. Add alloying elements to the weld metal, to raise the tensile strength, or to reduce aging, or to produce nuclei for grain size control, etc.
8. Permit a longer arc to be held in order that the globules, which are smaller than with bare electrodes, do not short circuit the gap.
9. Perform metallurgical refining operations, such as deoxidation.
10. Change the apparent resistance of the arc gap, to control the deposition efficiency.
11. Retard the rate of cooling and solidification of weld metal. The annealing effect of the slag, particularly if it protects the weld from oxidation is said to reduce shrinkage stresses
12. Facilitate specific welding operations, such as overhead welding, fillet welding etc.
13. Permit use of different types of current.
14. Reduce spatter or fume.
15. Produce a weld of desired smooth contour.

16. Provide slag that is easily detachable from the weld deposit (low coefficient of expansion or transformations).
17. Provide a slag that is immiscible in weld metal.
18. Dissolve scale or rust on surfaces to be welded.
19. Provide a slag to cover the weld puddle completely.