A novel binucleating Schiff base ligands have been prepared by the condensation between 3,3’diaminobenzidine with phthalaldehyde monoxime, 2, 3 butanedione monoxime and O-hydroxyacetophenone. The Schiff base ligands and metal complexes were characterized by elemental analysis, UV, IR, $^1$H NMR, $^{13}$C NMR, conductivity measurements, cyclic voltammetry, thermal studies, EPR and magnetic studies. In molar conductance studies, most of the complexes showed non-electrolytic in nature and only few of the complexes were electrolytic in nature. The binucleating ligand can coordinate with two metal ions to form binuclear complexes and the complexes exhibit octahedral and square planar arrangements. In electrochemical studies, the resulting cyclic voltammograms indicates that the metal(II) complexes followed quasi-reversible reactions with one electron transfer. The TGA curves show that the decomposition takes place in three steps for metal complexes. The synthesized ligand, in comparison to their metal complexes also were screened for its antimicrobial activity against *Staphylococcus aureus* and *Streptococcus pyogenes* as Gram-positive bacteria and *Escherichia coli* and *Klebsiella pneumoniae* as Gram-negative and the fungi *Fusarium oxysporum*, *Aspergillus fumigatus* and *Aspergillus flavus*. In antimicrobial activity, all complexes are showed good antimicrobial activity than ligands. The DNA binding properties of copper(II) metal complexes have been investigated by electronic absorption spectroscopy, viscosity measurements and cyclic voltammetry. Results suggest that the copper(II) complexes bind to DNA via an intercalation binding mode. The nucleolytic cleavage activities of the ligands and their complexes were assayed by using gel electrophoresis in the presence of H$_2$O$_2$. Metal(II) binuclear complexes are showed significant cleavages.