Proteins can be easily distributed into three core classes, which relate with characteristic tertiary structures: globular proteins, fibrous proteins, and membrane proteins. Nearly all globular proteins are solvable, out of which several are enzymes. The second class of proteins is often structural, for instance collagen, the main constituent of connective tissue, and keratin, the protein element present in nails and hair. Membrane proteins a lot help as receptors or offer channels for polar or charged molecules to pass by the membrane of the cell. 4.1.1 Isoelectric point: The isoelectric point, at times shortened to IEP, is defined as the pH at which a specific molecule or surface has no net electrical charge and as a result will not drift in an electric field. Proteins precipitate utmost readily at their IEP a characteristic property that may be used to separate amino acids and mixtures of proteins. The amino acids give proteins their total charge and these proteins may be negative, positive, polar or neutral in nature. At the pH lower than their IEP, proteins have a net +ve charge; above their isoelectric point proteins have a net –ve charge. Hence they can be separated according to their IEP (overall charge) on a polyacrylamide gel by means of a method known as isoelectric focusing, that uses the pH gradient parameter to isolate proteins. IEP is also the first stage in two-dimensional polyacrylamide gel electrophoresis. Proteins precipitate best at their IEP; a property that may be exploited to separate out mixtures of amino acids or proteinPROTEIN POLYMORPHISM: Many proteins circulating in serum show noticeable polymorphisms, with alleles that have adequate frequency alterations to be of utmost significance in blood typing. Haptoglobin (Hp) was the most extensively used polymorphic serum protein in forensic biology. The first instances of genetically determiFurthermore, because the genetic code is degenerate (more than one codon for most amino acids), protein polymorphism does not reveal all of the genetic variation present in protein-coding genes. Genetic changes that do not alter protein structure may alter patterns of protein synthesis during development and canFORENSIC APPLICATIONS: Some of the proteins flowing in serum show evident polymorphisms, with alleles that have enough frequency variances to be of importance in blood typing. Transferrin (Tf) and Group Specific Component (Gc) were two serum proteins which offered significant possibilities and were becoming normally used just before the beginning of DNA typing. Nevertheless, haptoglobin (Hp) was the most extensively used polymorphic serum proteins in forensic biology. Haptoglobin is a hemoglobin binding protein found in the α-globulin fraction of serum. The two alleles namely Hp 1 and Hp 2 have various exceptional variants at each allele. The alleles are separated by electrophoresis on a gradient polyacrylamide gel a technique wherein the concentration of gel varies from 5 percent at the top to 30 percent at the bottom thereby giving an improved separation by molecular sieving. Haptoglobin is a reasonably good system for use in forensic serology. It is constant with stains and the assay is very sensitive, requiring hemoglobin screening process for instance leucomalachite green to visualize bands by reacting them with bound hemoglobin. Hemoglobin is however one more protein made from two pairs of polypeptide chains. It has different variations. All have the same structure for one of the pairs of polypeptide chains – designated as α. The dominant form is Hb A i.e hemoglobin A formed of two alpha and two beta chains and is found in adult human beings. About 2 to 3 per cent of human adult Hb consists of a variant called HbA2 in which the β chains are replaced by two δ chains. A more noteworthy variation is HbF, which makes up to around 70 percent of the hemoglobin in fetal blood. Fetal hemoglobin consists of a pair of gamma chains as a substitute of β chain. HbF is rapidly replaced by HbA after birth and only a trace remains by age 1 year. Detection of HbF in a blood stain is an indicator of fetal blood. The typical test is a grouping of process of electrophoresis and the resistance of fetal hemoglobin. be very important to an organism. When all

kinds of variation are considered, it is evident that most species have an enormous potential for further evolutionary change.ned protein variation were detected in antigens found in blood the so called blood group antigens. Defective proteins can cause different kinds of diseases such as oxygen carrying proteins (sickle cell anaemia), connective tissue proteins (Marfan Syndrome, Osteogenesis imperfect) and blood clotting factors (Haemophilia A and Haemophilia B). Diverse allelic forms of genes code for proteins which may perhaps vary to some extent in the sequence of their amino acids. This process is also known as protein polymorphism. If these differences affect the protein's net electric charge, the different allelic forms can be separated using protein electrophoresis. We can identify the genotypes of particular individuals for protein-coding genes and measure allelic frequencies in the population

FORENSIC APPLICATIONS: Some of the proteins flowing in serum show evident polymorphisms, with alleles that have enough frequency variances to be of importance in blood typing. Transferrin (Tf) and Group Specific Component (Gc) were two serum proteins which offered significant possibilities and were becoming normally used just before the beginning of DNA typing. Nevertheless, haptoglobin (Hp) was the most extensively used polymorphic serum proteins in forensic biology. Haptoglobin is a hemoglobin binding protein found in the α-globulin fraction of serum. The two alleles namely Hp 1 and Hp 2 have various exceptional variants at each allele. The alleles are separated by electrophoresis on a gradient polyacrylamide gel a technique wherein the concentration of gel varies from 5 percent at the top to 30 percent at the bottom thereby giving an improved separation by molecular sieving. Haptoglobin is a reasonably good system for use in forensic serology. It is constant with stains and the assay is very sensitive, requiring hemoglobin screening process for instance leucomalachite green to visualize bands by reacting them with bound hemoglobin. Hemoglobin is however one more protein made from two pairs of polypeptide chains. It has different variations. All have the same structure for one of the pairs of polypeptide chains – designated as α. The dominant form is Hb A i.e hemoglobin A formed of two alpha and two beta chains and is found in adult human beings. About 2 to 3 per cent of human adult Hb consists of a variant called HbA2 in which the β chains are replaced by two δ chains. A more noteworthy variation is HbF, which makes up to around 70 percent of the hemoglobin in fetal blood. Fetal hemoglobin consists of a pair of gamma chains as a substitute of β chain. HbF is rapidly replaced by HbA after birth and only a trace remains by age 1 year. Detection of HbF in a blood stain is an indicator of fetal blood. The typical test is a grouping of process of electrophoresis and the resistance of fetal hemoglobin.

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