

APPENDIX I

GLOSSARY OF LEGAL TERMS

- Action** : A proceeding in a Civil Court.
- Actus reus** : Actual physical act causing death.
- Ad hoc** : For this purpose.
- Affidavit** : A written statement in the name of a person, called the deponent by whom it is voluntarily signed and sworn to or affirmed.
- Appellant** : The person who files an appeal.
- Assessor** : One who assists the Court in trying a scientific or technical question, but who has no voice in the decision.
- Binding over** : Requiring a person to enter into a recognisance to perform some necessary act, e.g., binding over a person to give evidence.
- Civil case** : A case between two parties in their private capacity, e.g., money matters, property, etc.
- Cognisable offence** : An offence, in which a police officer can arrest a person without warrant from the Magistrate, e.g. rape, murder, robbery, etc.
- Committal** : The sending of a person to prison generally for a short period or temporary purpose.
- Common law** : Judge made law as opposed to codified law, i.e., law passed by legislature.
- Contempt** : A wilful disregard or disobedience of Court's orders, as well as such conduct as tends to bring the authority of the Court and the administration of law into disrepute, or in some manner impede due administration of justice.
- Crime** : A social harm which has been defined and made punishable by law.
- Criminal case** : A case between two parties in the public interest, e.g. thefts, murder, assaults, etc. One party is the government through the police.
- Complainant** : One who makes a complaint to justices.
- Corpus delict** : That which has constituted a breach of law.
- Defendant** : The person against whom a civil action is filed.
- Damage** : The injury suffered by a party.
- Damages** : The amount of compensation payable to a party to whom injury has been done.
- Decree** : A document under the seal of a Court setting out the relief granted to a party or parties.
- De facto** : In fact.
- De jure** : By right.
- Deposition** : Evidence given on oath.
- Exhibit** : A document or thing produced for the inspection of Court, or sworn to a witness, giving evidence or referred to in a deposition.
- Ex gratia** : As a favour.
- Ex officio** : By virtue of his office.
- Ex parte** : An application in judicial proceeding made (1) by an interested person who is not a party, (2) by one party in the absence of the other.
- Felony** : A category of crimes, e.g. murder, manslaughter, burglary, house-breaking, rape.
- Ibid** : In the same place.
- Idem** : The same.
- In camera** : The hearing of a case in private, e.g. in Court, the public being excluded.
- Inter alia** : Among others.
- Ipsa facto** : By the mere fact.
- Malafides** : Bad faith.
- Malfeasance** : The doing of a civil or unlawful act.
- Malice aforethought** : The element of evil in the crime of murder.
- Mens rea** : (guilty mind): An evil intention, or knowledge of the wrongfulness of an act.
- Manslaughter** : Unlawful homicide not amounting to wilful murder.
- Misadventure** : An accident or mischance, unexpected and undesigned, arising out of lawful act.
- Misdemeanour** : Any crime or indictable offence not amounting to felony, such as perjury, conspiracy, and public nuisances.
- Moral turpitude** : An act of baseness, vileness, or depravity in private and social duties which a man owes to his fellowmen or to society in general, but not such acts as are not of themselves immoral, but whose illegality lies in the fact of their being positively prohibited by law.
- Mutatis mutadis** : The necessary changes being made.
- Obiter dictum** : A generally accepted view. A Judge's comment.
- Offence** : Any act or omission made punishable by law.
- Over act** : An open act.
- Pari passu** : Equally; without preference.
- Per se** : Taken alone; by itself.
- Plaintiff** : The person who files the suit.
- Precognition** : A statement or deposition which

would form the basis of the oral testimony which a witness would give at subsequent trial.

Res judicata : A matter already adjudged and decided.

Respondent : The person against whom an appeal is filed.

Sine die : Indefinitely.

Statue : The law as passed by legislature.

Status quo : The state in which things are, or were.

Sub judice : In course of trial.

Suit : A civil proceeding in a civil Court of law.

Summons case : A case relating to an offence, and not being a warrant case.

Testator : One who makes a will.

Testimony : The oral evidence of a witness in Court.

Tort : A civil wrong. An act which causes harm

to determinate person, whether intentionally or not.
Ultra vires : An act in excess of the authority conferred by law and therefore invalid.

Viva voce : By word of mouth.

Ward : A minor or child under the protection and care of a guardian.

Warrant : A written order for the arrest of persons, or for their forcible production in Court as witness.

Warrant case : A case relating to an offence punishable with death, imprisonment for life or imprisonment for a term exceeding two years.

Will : A document by which a person expresses his desire about the devolution and distribution of his property after his death.

Writ : A document under the seal of Court, commanding the person to whom it is addressed to do or not to do some act.

APPENDIX-II

INTERNATIONAL CODE OF MEDICAL ETHICS

An International Code of Medical Ethics (derived from the Declaration of Geneva) was originally adopted by the World Medical Association in 1949. The code was amended in 1968 and in 1983 and currently reads :

Duties of physicians in general

A physician shall always maintain the highest standards of professional conduct.

A physician shall not permit motives of profit to influence the free and independent exercise of professional judgement on behalf of patients.

A physician shall, in all types of medical practice, be dedicated to providing competent medical service in full technical and moral independence, with compassion and respect for human dignity.

A physician shall deal honestly with patients and colleagues and strive to expose those physicians deficient in character or competence or who engage in fraud or deception.

The following practices are deemed to be unethical conduct : (a) Self-advertising by physicians, unless permitted by the laws of the country and the Code of Ethics of the National Medical Association. (b) Paying or receiving any fee or other consideration solely to procure the referral of a patient or for prescribing or referring a patient to any source.

A physician shall respect the rights of patients, of colleagues and of other health professionals and shall safeguard patient confidences.

A physician shall act only in the patient's interest when providing medical care which might have the effect of weakening the physical and mental condition of the patient.

A physician shall use great caution in divulging discoveries or new techniques or treatment through non-professional channels.

A physician shall certify only that which he has personally verified.

Duties of physicians to the sick

A physician shall always bear in mind the obligation of preserving human life.

A physician shall owe his patients complete loyalty and all the resources of his science. Whenever an examination or treatment is beyond the physician's capacity, he should summon another physician who has the necessary ability.

A physician shall observe absolute confidentiality on all he knows about his patient even after the patient has died.

A physician shall give emergency care as a humanitarian duty unless he is assured that others are willing and able to give such care.

Duties of physicians to each other

A physician shall behave towards his colleagues as he would have them behave towards him.

A physician shall not entice patients from his colleagues.

A physician shall observe the principles of the Declaration of Geneva approved by the World Medical Association.

DECLARATION OF TOKYO, 1975

The World Medical Association adopted the following guidelines for medical doctors concerning Torture and other Cruel, Inhuman or Degrading Treatment or Punishment in relation to Detention and Imprisonment. (1) The doctor shall not countenance, condone or participate in the practice of torture (physical or mental suffering) or other forms of cruel, inhuman or degrading procedure, whatever the offence of prisoners or detainees may be, and whatever be the victim's motives or beliefs, and in all situations, including armed conflict and civil strife. (2) The doctor shall not provide any premises, instruments, substances or knowledge to facilitate the practice of torture or other forms of cruel, inhuman or degrading treatment or to diminish the ability of the victim to resist such treatment. (3) The doctor shall not be present during any procedure during which torture or other forms of cruel treatment is used or threatened. (4) A doctor must have complete clinical independence in deciding upon the care of a patient. (5) If a prisoner refuses nourishment, and is capable of forming a rational judgement about the consequences, he should not be fed artificially. (6) The doctor shall in all circumstances be bound to alleviate the distress of his fellow men, and no motive shall prevail against this higher purpose.

The General Assembly of the United Nations, 1982, also approved a declaration on principles of "Medical Ethics Relevant to the Role of Health Personnel, particularly physicians, in the protection of the Prisoners and Detainees against Torture, and other Cruel, Inhuman or Degrading Treatment or Punishment".

Other important declarations of the World Medical Association include (1) The Declaration of Sydney (1968), concerning the definition of death. (2) The Declaration of Oslo (1970 & 1983), concerning therapeutic abortion. (3) The Declaration of Munich (1973), concerning racial, political discrimination, etc. in medicine. (4) The Declaration of Helsinki (1975), concerning human experimentation and clinical trials. (5) The Declaration of Lisbon (1981), concerning the rights of patient. (6) The Declaration of Venice (1983), concerning terminal illness. (7) The Declaration of San Paulo (1984), concerning pollution. (8) The Declaration of Madrid (1987), concerning professional autonomy and self-regulation. (9) The Declaration of Rancho Mirage (1987), concerning medical education. (10) The Declaration of Hong Kong (1989), concerning the abuse of the elderly. (11) The Declaration of Lisbon (1995), concerning the rights of the patient. (12) The Declaration of Helsinki (1996), concerning biomedical research involving human subjects. (13) The Declaration of Hamburg (1997), concerning support for doctors refusing to participate in torture or other forms of cruel, inhuman or degrading treatment. (14) The Declaration of Ottawa (1998), concerning the rights of the child to health care.

APPENDIX-III

FORMULAE FOR ESTIMATION OF STATURE

Multiplication factors for estimating the stature for an individual of some States of India

		Pan (1924) Hindus of Bengal Bihar and Orissa		Nat (1931) Residents of United provinces (Uttar Pradesh)	Siddiqui and Shah (1944) Punjabis
		Males	Females	Males	Males
(1)	Humerus	5.31	5.31	5.3	5.3
(2)	Radius	6.78	6.7	6.9	6.4
(3)	Ulna	6.00	6.0	6.3	6.0
(4)	Femur	3.82	3.08	3.7	3.6
(5)	Tibia	4.49	4.46	4.48	4.4
(6)	Fibula	4.46	4.43	4.48	4.4

APPENDIX-IV

ANALYTICAL METHODS IN TOXICOLOGY

CHROMATOGRAPHY: It depends upon the ability of a solvent to carry a substance with it as it diffuses in a medium which itself tends to hold back that substance. The substance will have moved a constant distance after a given time, in which the solvent has been allowed to diffuse. The ratio of the distance travelled by the substance to the distance travelled by the solvent is known as the Rf value of the substance for that particular system. Several substances may have the same Rf value in a given set of circumstances, but they can be separated by using different systems. Identification of the substance, then rests on comparing the disclosed Rf values with those which are detailed in reference tables. It is used in the analysis of organic substances.

(1) THIN-LAYER CHROMATOGRAPHY (TLC): It is the simplest analytical technique commonly used for qualitative screening of large batches of (usually organic solvents) samples. A very thin layer of a substance such as permutit, silica gel or aluminium oxide is applied to a glass plate of 20 x 20 x 0.5 cm. as ion exchange resins. Vertical lines are drawn 1.5 cm. apart to allow individual runways for each sample. Purified tissue extracts dissolved in 0.5 ml of methanol are serially spotted with a micropipette and dried in a small circle in the lower centre of a runway 1.5 cm. from the bottom. Other samples are similarly spotted in other runways. A horizontal line (stop point) is drawn 10 or 15 cm. above these starting points. A TLC tank is filled with suitable developing solvents to a depth of about one cm. from the bottom. The plate properly spotted is then dipped into the solvent, the lid is firmly closed and the atmosphere is allowed to saturate with vapour. When the solvent front just touches the 10 cm. horizontal mark, the plate is removed and examined under UV light (at 254 nm and 366 nm) for characteristic fluorescence or absorbance. The separated compounds are stained by using a number of chemical sprays. The compounds are identified based on their staining characteristics and distance of migration when compared to known standards. The test is completed in two hours. This lacks specificity.

Approximate quantitation can be done by comparison with standards similarly prepared on the same plate, for intensity of colour and area size. The order of separation of compounds can be altered simply by changing the nature of the developing agent.

(2) PAPER CHROMATOGRAPHY : Paper is used as the support or adsorbent, but partition probably plays a greater part than adsorption in the separation of the components of mixtures, as the cellulose fibres have a film of moisture around them even in the air-dry state.

(3) COLUMN CHROMATOGRAPHY (HPLC): It is of two types, (a) adsorption chromatography, (b) partition chromatography.

(4) HIGH-PRESSURE LIQUID CHROMATOGRAPHY (HPLC) : This is similar to gas chromatography, except that the sample is in a liquid state rather than in a volatile state. This technique can be used to separate and to analyse complex mixtures. This is similar to gas chromatography, except that the sample is in a liquid state rather than in a volatile state. A high pressure (1000 to 6000 pounds per square inch) pump facilitates movement of the specimen through the columns packed with chromatographic adsorbents, e.g. silica gel and alumina. The effluent stream passes through a detector, usually an ultraviolet spectrophotometer, and the appearance of a drug in the solvent is signalled by a recorder peak in the same way as in GC. Again, the size of the peak is proportional to the concentration of drug in the sample. It can quantitate both the drug and its metabolites in a single analysis. This test is not 100% specific.

(5) GAS CHROMATOGRAPHY (GC) : It is a thermal chamber or oven, in which temperature can be precisely controlled. A long thin spiral tube (column) packed with finely divided solid (carbowax or adiponitrile) coated with a viscous liquid is instilled in it. This liquid is known as stationary phase. About one ml of sample to be analysed is injected by means of a gas-tight syringe into injection port situated at one end of the column. The sample is forced through the column by pressurised streams of carrier gas (helium) known

as the mobile phase. At the end of the column, the sample is separated into bands of like molecules, which pass through a flame ionisation detector. The ionised gases generate electrical signal, which is amplified and used to power a mechanical stylus (pen) which produces a chromatogram, into a strip of moving chart paper. This is compared with a known reference standard, to identify a compound present in the unknown mixture. The position of the peak along the chart paper identifies the substance. The area of the peak indicates its approximate concentration. The chromatograph can analyse only liquids and gases, but if a pyrolyser is attached to it, organic solids can also be identified. GC is extremely sensitive and can analyse a number of compounds simultaneously. It is commonly used to quantitate blood levels of volatile liquids, such as ethanol, methanol, ethylene glycol, etc.

Electron capture detector, and the alkali flame detector (nitrogen detector) widen the scope of plasma screening.

SPECTROPHOTOMETRY: The principle involved in spectrophotometry is that there should be no difference between the intensities of the sample and reference beams at all times. Light from the appropriate source which is selected automatically, is passed through the prism. The beam is switched alternatively through the sample and reference beams, produces an electrical signal from the photomultiplier. In spectrophotometer for use in the ultraviolet and visible regions of the spectrum, the sample compartment is placed so that radiation emerging from the monochromator passes through solutions.

(A) MASS SPECTROMETRY : It detects a substance in minute quantity. The testing material in trace amount is placed inside a high-vacuum chamber and is then collided by high energy electrons. This causes loss of electron from the molecules of the testing material which get positively charged. These molecules breakdown instantaneously into numerous fragments, which are then separated according to their mass, by passing them through an electromagnetic field. The graphic presentation of the minute particles of the mass as obtained subsequently, by the same process as applied in case of U.V. or I.R. spectrometry gives a complex pattern with qualitative

and quantitative assessment of the material tested. The lines in the graph represent the mass and the height of the lines represent the quantity of each fragmented mass. Thus, the whole graph acts as an unique picture for a material. Mass spectroscopy is applicable only in case of testing some pure material. In case of possible admixture or impurity, the components of the material may first be subjected to fractional separation by gas chromatography and then tested by mass spectrometry for identification and estimation of each type of matter present in the complex. Chemical ionisation mass spectrometry is an easier process to identify components of a mixture without application of gas chromatography beforehand.

(B) INFRARED SPECTROPHOTOMETRY : This instrument is useful for the identification of organic compounds, because each compound has a characteristic spectrum based upon its structure. The use of KBr or KI pelleting process for solids allows accurate determination of drugs and chemicals in the range of 2 to 1000 μg .

(C) ATOMIC ABSORPTION SPECTROPHOTOMETRY (AAS) : Here, an element or compound is subjected to the contact of acetylene air flame or a graphite furnace, or a heated strip of metal for vaporisation of atoms of the specimen. Radiation from a light source of similar type is directed towards the vaporised atoms which absorbs the radiation energy with displacement of electrons from the outer circle of the atom. This movement of the electrons emit energy which is passed through a manometer and then the selective radiation is processed through the detector and recorded graphically, which identifies the element's presence in the component. **Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)** is a new development that allows simultaneous multi-element analysis. Seventeen elements can be measured from a single sample; aluminium, barium, cadmium, chromium, copper, iron, lanthanum, lead, manganese, molybdenum, nickel, platinum, silver, strontium, tin, titanium and zinc.

(D) SPECTROFLUORIMETRY: Spectrofluorimetry bears the same relationship to fluorimetry as spectrophotometry does to absorptimetry, i.e., the intensity of fluorescence can be measured at different wavelengths to give a fluorescence emission spectrum. The technique provides additional data

in the sense that it is possible to reproduce the absorption curve of fluorescent substance as an excitation spectrum at a concentration very much less than those required in spectrophotometry. In spectrofluorimetry on the other hand, a distinction is required between a very weak intensity of fluorescence and that of still weaker fluorescence of blank, and this difference is very smaller than that measurable in spectrophotometry.

(E) ULTRAVIOLET SPECTROPHOTOMETRY (UVS) : This technique is based on the principle that many drugs when in solution will absorb UV radiation. The degree of absorption depends on the chemical structure of the drug, its concentration in the solution, and the wavelength of the UVR. The monochromator can select from the light source an ultraviolet ray of any given wavelength ranging from 200 to 340 nm. The sample extract in aqueous medium is placed in a transparent quartz cuvette in the path of the radiation.

The amount of UV radiation which passes through the solution is measured by the photocell. By steady rotation of the monochromator, it is possible to pass sequentially UV rays of all wavelengths from 200 to 340 nm through the extract. The photocell monitors the amount of radiation absorbed at each wavelength and this is transcribed on to a recorded chart. The shape of the spectrum, the wavelength at which absorption is at a maximum, and any changes brought about by changing the pH of the extract are all used as an aid to characterise the agent present. This technique is ideal to quantitate blood levels of paracetamol and salicylates, as well as urine levels of phenothiazines.

(F) EMISSION SPECTROGRAPH : Every element, on being excited appropriately, emits light spectrum. The spectrum can be separated and recorded by photography. The element to be tested is placed in between two carbon electrodes to vaporise and excite the particles of vapour which then emits light, which is then passed through a lens and then through a prism to spread the spectrum which is again passed through another lens to focus it on a screen to be photographed for further study and preserving as record. None of the elements give similar line of spectrum and from the bands of spectrum and dark bands the element can be identified.

In case of a compound, many lines of spectra are recorded having a specific type for each element. From the combination of different lines of spectra, the elementary combination of the component can be assessed and then the compound can be identified and compared with another by similar test. A modification of the process may be adapted by use of laser beam at the initial phase to vaporise the compound. Rest of the test, i.e., exciting of the elements of the compound by carbon electrodes and the subsequent process is same as in the other variety of emission spectroscopy.

GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) : In this gas chromatography separates the drugs and a mass spectrometer positively identifies them. This method of analysis is 100% specific. It separates the components of biologic extracts and sensitively detects toxic agents in a complex matrix of biochemicals. By means of chemical ionisation and single or multiple ion monitoring techniques, microgram quantitative analyses are possible.

About one ml sample is injected into the GC and separated on various types of chromatography columns. Syringes, empty capsules and biologic fluids can be analysed for drugs. A column that is selected has good constituent separation, a large range of unstable temperatures and a low background bleed. Helium is used as a carrier gas and is eliminated after chromatography by a jet separator or a diffusion membrane.

As in all mass spectrometers, neutral molecules from the gas chromatograph enter the ion source and are ionised by a stream of electrons, e.g. E_1 -electron Impact Mass Spectrometry. Positively charged ions predominate and are used in the analysis. Ionisation under standard electron energy conditions always occurs at the same bonds in the molecule, thus permitting a reproducible pattern of ions into the quadruple filter, are detected by an electron multiplier, and the amplified signal is displayed as the mass spectrum on an oscilloscope or oscillographic recorder. The total ion current (with a peak for each component separated by the GC and entering the MS) represents the usual gas chromatogram and is continuously plotted on a simple potentiometric recorder as the GC-MS analysis proceeds. The output signal can be fed to a computer or data-processing system for storage

and manipulation. Both the mass values of the molecule fragments and their relative abundance are qualitatively characteristic of the compound analysed. In the mass spectrum, the most abundant ion is referred to as the base peak and the unfragmented, but positively charged molecule as the molecular ion or parent molecule. The horizontal axis of the spectrum graph represents atomic mass number in which the charge is usually one.

Data Interpretation : The data that are available following a toxicological analysis of a blood, urine or tissue sample, using GC-MS instrumentation is: extraction characteristics which indicate chemical character (acid, base, neutral) of the compound, the GC retention time relative to a standard compound providing a first presumptive identity, and the mass spectrum which displays the unique molecular fragmentation pattern of the compound. This information must be in consonance before a final specific identification is acceptable. The GC-MS data are compared to libraries of GC retention times and mass spectra of standard compounds to match the unknown to a compound in the library. Following the library search, the teletype prints out the most likely identification according to the least number of mismatches between the unknown and the stored standard. If the library is stored in an inhouse dedicated computer or GC-MS interactive data system, the results can be displayed on a CRT (cathode ray tube) screen very rapidly for comparative inspection, and spectra automatically plotted in normalised form by the computer. A reconstructed gas chromatogram, either total ion display or limited mass search, can also be plotted.

Computer : The dedicated computer or interactive data system expands the instrument capability to an extraordinary degree. No analytical data are lost because the computer can continuously accept, normalise and store 3-second mass spectrum scans as the gas chromatography analysis proceeds in real time. Therefore, in a typical 10 minute GC run, 200 mass spectra will be obtained. The data system is vital to the best quantitative GC-MS analysis and qualitative processing of raw data.

IMMUNOASSAY METHODS : (1) Radioimmunoassay (RIA). (2) Fluorescent immunoassay. (3) Enzyme-mediated immunoassay technique (EMIT). These are convenient methods of screening for a specific drug or group of drugs. The

basis for these methods is detection of the reaction between an antibody for the drug and the drug.

RIA is a very sensitive and less specific technique for quantitative analysis. Mixing known quantities of drug-specific antibody and known amounts of radioactive labelled drug to the specimen to be analysed causes a precipitation reaction. The precipitate is removed and measured with a gamma counter. The gamma emittance is inversely related to the quantity of assay drug present in the patient's specimen. It detects very low concentrations of drugs, such as cannabis, digoxin, LSD, paraquat, etc.

EMIT is very useful for quantitative analysis of many popular drugs and substances of abuse. It is specific but less sensitive than RIA and is much easier to use and produces results more rapidly. It works on the principle that the amount of drug present is proportional to the inhibition of an enzyme-substrate reaction. A known quantity of a drug is labelled by chemical attachment to an enzyme. Drug specific antibodies added to the specimen bind the drug-enzyme complex, thereby reducing enzyme activity. Free drug in the specimen competes with enzyme labelled drug and limits the antibody-induced enzyme inactivation. Enzyme activity correlates with drug concentration in the specimen as measured by absorbance change resulting from the enzyme catalytic action on a substrate.

Nuclear Magnetic Resonance (NMR) : It can perform both definitive substance identification and screening of body, but sensitivity is much lower than GC-MS.

Melting point Apparatus : Melting point is determined in a capillary tube and this can be matched with results given in a standard reference book.

Ultraviolet Spectroscopy : Many drugs have characteristic ultraviolet spectra, but they must be extracted from body fluids.

Refractometer : Toxic substances can be readily identified from their index of refraction.

Calorimeter : It measures the amount of transmitted light of substances.

Polarimeter : As many drugs and synthetic poisons are optically active, they can be identified through this physical property.

Polarography : This is an electro-chemical method of analysis.

ELECTROPHORESIS : Different protein components of different body fluids are identified by this method. The stationary phase is made of starch or agar gel on a glass slide. The testing material is placed at one end of the stationary phase (gel layer on the slide). Electrodes are attached at both ends of the gel slide. Electrically charged protein component moves on the phase plate and at the end, the gel plate is treated with the colouring agent for the protein which causes appearance of visible characteristic bands depending on the characters of the protein.

NEUTRON ACTIVATION ANALYSIS

This is a highly sophisticated and expensive method of detection of a variety of inorganic elements at levels well below the limits of conventional analytical techniques. The sensitivity attained is 100 or even 1000 times better than by any other method. It is based on the principle that many substances become radioactive when exposed to bombardment by neutrons. The induced radioactivity is highly specific of the elements contributing to it.

When an atom is bombarded with a neutron, isotope of the atom with increased number of neutron develops. However, most of such newly formed isotopes are decomposed and there is

radioactive decay of the isotopes. There is radioactivity in the process with liberation of alpha, beta and gamma rays. Alpha rays are positively charged particles, beta rays are electrons and gamma rays are electromagnetic radiation. In a neutron reactor, neutron is bombarded to an atom which enters the nucleus of the atom and during disintegration the gamma ray radioactivity is liberated. This has characteristic energy value which is assessed by means of either a Geiger counter or a scintillation counter to know the atom of the element.

Many elements can be studied at a time inside a reactor. The characteristic energy value of gamma rays identifies the type of the element and the intensity of gamma ray radiation gives the concentration of the element in a substance.

It identifies an element or compound in one billionth of a gram. Neutron activation analysis can be used for the estimation of any of the 90 naturally occurring elements including antimony, arsenic, cadmium, copper, iron, lead, mercury, phosphorus, selenium, thallium and zinc. Since the trace elements present in hairs, nails, gun powder, drugs, paint, grease, glass, soil, etc. form a unique pattern, characteristics of their source, the method can render valuable aid in identification when comparison samples are available.

APPENDIX-V

MICROSCOPES IN FORENSIC USE

COMPARISON MICROSCOPE : It is basically two microscopes with identical optical system to give the same magnification, joined together by a comparison bridge and eye-piece, and permits the viewing of a portion (usually half) of the field of view from each microscope, side by side with a sharp dividing line in the eyepiece, which may be of either monocular or binocular type. The examiner can view a portion of two different bullets or cartridges simultaneously in a single microscopic field. Light rays from the surface of both the bullets are reflected and observed through the common eyepiece of the microscope. By adjustment of the positions of the two bullets, the reflected light rays from the primary marks of the two bullets are brought in the same line and observed whether they tally. Similarly, marks on the two bullets are brought closer on the same line.

If the marks on the two bullets tally in their dimensions and curvature, it can be opined that the bullet causing the death of the victim was fired from the gun examined.

STEREOSCOPIC MICROSCOPE : It can be used to examine bullets, cartridges, gun powder and other cartridge components, and bullet holes and surfaces around such holes, as well as surfaces of firearms or firearm parts. In this two eyepieces give pictures of two planes of the material examined, giving a 3 dimensional image. It is a reflection microscope which gives surface view of trace elements present on the surface of some other object. The field of view being wider, a wider surface can be examined. The magnification is 15 to 125.

FLUORESCENT MICROSCOPE : By this type only certain specific items can be studied. The specimen treated with fluorescent agent, after

absorption of invisible short wavelength, high frequency rays (e.g. U.V. rays), cause emission of rays of longer wavelength and lesser frequency, so as to make the emitted rays visible due to presence of fluorescent agent.

POLARISING MICROSCOPE : In this polariser and analyser are used, the former in between the source of light and the object of study, and the latter (the analyser) in between the object and the eye piece. Though light passes in straight lines in all directions, some materials allow the light (passed through it), to travel in one plane only and not in all directions. This is the function of both polariser and analyser. A polarising lens turns the path of light rays passed through it, to pass in one direction only. The analyser (which is actually another polariser), is used to ascertain, whether the polariser limited the path of light passed through it, in one plane or not. When the analyser is placed in a perpendicular plane, in comparison to the placement of the polariser, then it can be understood if light from the matter tested, was polarised by polariser or not, as in such a case the analyser being placed in the stated manner, will change the pathway of the light rays coming in one plane, after passing through the polariser and will not be visible. Placement of the analyser then, in the same plane of the polariser will cause the light rays to pass in the same direction and the matter will now be visible, if looked through the microscope. By this method, nature of dispersion of light rays by the tested specimen will be known. In this way a polarising microscope identifies the nature of the specimens tested (mostly minerals), from their nature of dispersion.

ELECTRON MICROSCOPE OR SCANNING ELECTRON MICROSCOPE (S.E.M) : This is used in the study of surface of some objects, so as to identify it, or any trace material, up to the level

of elements. The use of S.E.M. gives highly magnified detail picture of the surface of the material tested for trace element, as well as, a graphic presentation of electrons emitted by the element present in the testing substance which gives clear identification of the trace elements.

Beam of electrons is emitted from a hot tungsten filament. These electron beams are focussed on the surface of the testing material by means of electromagnets. The focussed primary electrons cause emission of electrons from the surface of the testing material. These emitted electrons are scanned, amplified and fed into a cathode ray tube to be converted and focussed on a screen to produce magnified pictures. The magnification of the image may be up to one lakh times than the real dimension of the testing particles. The depth of the picture is about 300 times more than other surface microscopes and the magnified image of surface of the testing material has a 3 dimensional stereoscopic appearance. This helps identification of minute trace elements present on the surface of matter, the exact nature of which is required to be known. Electrons, striking surface of the testing material, also produce X-ray which is deflected from the surface. With the help of an X-ray analyser and recorder, the amount of X-ray emitted, and its character can be known which will identify the elements present on the surface of the examined sample.

It is used to analyse paints, metals, fibres and other similar items. The consistency of a paint layer and its irregularities can best be examined and noted with SEM. It can be used along with X-ray fluorescence. Very small particles can be observed, and elemental constituent data can be obtained. The edges of paint chips can be analysed and the differences in elemental makeup can be identified and compared to other paint chips.

APPENDIX-VI
POSTMORTEM
REQUISITION FOR POST-MORTEM EXAMINATION
POLICE

No. Date

From

To

Sir,

You are requested to hold a Post-mortem Examination on the body of sent herewith through (name) H.C./P.C.No. Please furnish your report on the attached form.

It is to be particularly noted that the examination should extend to every part of the body.

Place : Station House Officer

REPORT TO BE FORWARDED WITH THE
BODY SENT FOR POST-MORTEM
EXAMINATION

(1) Preliminary Particulars :

Name :

Aged about years

Male/Female Approximate height cm.

Colour of eyes : Colour of hair :

Marks of identification : (1) (2)

Village : Caste :

Found/Died at A.M./P.M. on

at (place) sent by in-charge

of P.S. with P.C./Head-Constable No.

on at A.M./P.M.

(2) The following wounds are found on the body:

(3) The manner in which and the weapon or instrument (if any) with which the wounds mentioned in item No.2 appear to have been inflicted :

(4) The following articles are sent with the corpse:

Clothes : Ornaments - Jewellery :

Excreta : Vomit :

Weapons :

Station :

Date : Investigating Police Officer

POSTMORTEM CERTIFICATE

INSTRUCTIONS : (1) It is essential that in all cases, the autopsy should be a complete one. If a complete autopsy is not carried out by the Medical Officer, evidence which later may prove of great medico-legal importance may be irretrievably lost and the course of justice may be impeded. The responsibility of carrying out of

complete autopsy must rest solely with the Medical Officer. (2) The identity of the body should be confirmed to the doctor by a police officer. If the identity is not known, all methods of establishing identity must be used. (3) The body should be examined with clothing in place, so that defects caused by trauma can be identified. After removal, clothing must be retained in clean bags and labelled. (4) The body should be photographed clothed and then unclothed and then any injuries or other abnormalities should be photographed in closer detail. (5) X-rays are advisable in victims of gunshot wounds and explosions. (6) The surface of the body should be examined for the presence of trace evidence, i.e. fibres, hair, blood, semen, saliva, etc. Fingernail clippings, head and pubic hair, anal and genital swabs, bite marks, swabs, etc., if necessary should be taken by the pathologist. (7) Careful documentation of all external injuries or abnormalities, their type, position, size, shape, etc., is most important and often has much greater value in understanding and in reconstructing the circumstances of injury than the internal dissection. (8) All body cavities should be opened and all the internal organs inspected in situ. All internal organs should then be removed and should be individually dissected and examined to identify injuries and any natural disease. (9) The removal and examination of the organs should be personally carried out by the Medical Officer. (10) All injuries or abnormalities found should be briefly, but fully and accurately described. Abnormal collections of fluid, e.g. pleural, pericardial, peritoneal, etc. should be accurately measured. The relative number, sizes, and distribution of petechial haemorrhages occurring in the substance of or on the surface (pericardial, pleural, etc.) of organs should be noted. When organs appear normal, the appropriate line of report should be endorsed "NOTHING ABNORMAL NOTED". Negative findings should be stated as they may be as important as positive findings. When, for any reason, organs are not examined, the appropriate line of the report should be endorsed "NOT EXAMINED"; it should not be

merely left blank, because in court, the absence of a comment may be taken to mean that it was not examined or specifically looked for. (11) The schedule of observation should be restricted entirely to the recording of facts as found by the Medical Officer at the autopsy. (12) Take the weight of all main internal organs. Tissue samples should be taken as necessary for histopathology and preserved in formalin. (13) Blood should be collected from a large limb vein, preferably from the femoral vein and urine by a syringe through the fundus of the bladder. (14) All signs of recent or old medical and surgical intervention and resuscitation must be described. (15) Make careful notes and drawings and diagrams. (16) In cases of suspected poisoning, the stomach and its contents, 30 cm. of upper part of small intestine and its contents. 500 gm. liver, half of each kidney, 30 ml of blood and 30 ml of urine should be retained for chemical examination. Clean, wide mouthed, white bottles of one litre capacity fitted with glass stoppers should be used for viscera. Blood should be collected in screw-capped bottle of about 30 ml. (17) Preserve the stomach, and its contents together with a piece of the upper part of small intestine in one bottle; small pieces of the liver and kidney in another bottle, and blood and urine in separate bottles. These viscera are to be preserved in rectified spirit or saturated solution of common salt. Seal and label the bottles. A sample of preservative used should always be sent for chemical analysis. (18) Interpret the overall findings so that the maximum information and opinion can be offered. (19) The report should be full, detailed, legible, comprehensive and objective. The report should be completed as soon as possible after the autopsy and the original post-mortem report sent direct to the concerned

Magistrate/I.O. in a sealed cover. (20) All forms filled for laboratory investigations should be labelled by the words MLC. (21) Cause of death should be given in the International Classification of Diseases. Where several alternatives for the cause of death exist, and the facts do not allow a differentiation between them, describe the alternatives, and if possible, rank them in order of probability. If this is not possible, then the cause of death should be certified as "Unascertained". (22) Some standard opinions are : (a) Death is due to shock and haemorrhage as a result of multiple injuries sustained (assault, traffic accident, etc.). (b) Death is due to asphyxia as a result of (hanging, strangulation, etc.). (c) Death is due to respiratory failure secondary to laryngeal oedema as a result of anaphylaxis (drug related deaths). (d) Death is due to (any complication) as a result of burns. (e) Death is due to respiratory failure as a result of consumption of (organophosphate or any other poison). (f) On perusal of case sheet, postmortem report and chemical analysis report, I am of the opinion that death is due to poisoning by (23) After autopsy, evaluation may be provisional, because later findings and later knowledge of other circumstantial facts can necessitate alteration and modifications. Provisional report should not be delayed more than a day or two. (24) The post-mortem findings, or any other evidence in the case, should not be discussed by the Medical Officer with any unauthorised person, but he should provide all facilities to the Investigating Officer. (25) Interested parties requiring a copy of the post-mortem report should apply to the concerned Magistrate/police station for such a copy, which should NOT be furnished direct by the Medical Officer.

SCHEDULE OF OBSERVATIONS

Date and hour of receipt of body	(3) Apparent Age :
.....	(4) Height :
Date and hour of autopsy	(5) Weight :
.....	(6) Physique : (State in appropriate terms, e.g. well-built, normal, thin, emaciated, etc.)
Body identified by (P.C.No..... name	(7) Nutritional state :
P.S. and others if any)	(8) Identifying Features : (If body is unidentified, describe all identifying features, e.g. skin colour, hair, colour of eyes, scars, moles, tattoo marks, circumcision, amputations, skin
Requisition received from (Designation and P.S):	

A. GENERAL

- (1) Name :
 (2) Sex :

diseases, deformities, dental condition, etc. and fingerprints).

- (9) **Clothes** : (List and describe type of garment, colour, consistency, tears, loss of buttons, etc. Cuts, holes, blackening, etc. should be noted and compared with injuries on the body. Discrepancies in such findings are also to be described. Stains due to blood, semen, grease, etc., poison, vomit, etc. should be described and preserved in clean plastic bags or other containers. List the ornaments and describe the type, design and colour of each (yellow or white metal; white, red or green stones, etc). Pocket contents, should be recorded).
- (10) **Post-mortem changes present** : (Note body temperature; describe degree (complete, partial, absent) and distribution of rigor mortis. Post-mortem lividity (distribution, intensity, colour, reversibility) and putrefactive signs (stained blood vessels, greenish discolouration, odour, softening of eye balls, distention of abdomen and body, exudation from nose and mouth, ova of flies, maggots, blebs over body, peeling of cuticle, loosening of hair, burst thorax and abdomen, sutures of skull, liquefaction of tissues, adipocere, mummification, skeletonization, etc.).
- (11) **External appearances** : (Condition of limbs (shape and abnormal mobility, abnormalities, injection marks, etc.). Describe position of body, stains of blood, vomit, poison, etc., and other trace evidence. In newborn infants note condition of umbilical cord, whether or not the body has been washed, and preserve any wrapping in which it was found. In all cases, examine all external orifices (eyes, ears, nostrils, mouth, anus, vagina, urethra). Note presence of disease, e.g. oedema of legs, dropsy surgical emphysema, skin disease, eruptions, bed sores, enlarged lymph nodes, and any other pathology).
- (12) **Injuries** : (Briefly but accurately describe all injuries and abnormalities found. State whether injuries are ante-mortem or post-mortem. Note nature, shape, exact measurements, direction, edges, margins, base and extremities, and location relative to anatomical landmarks, signs of vital reaction, foreign particles, discolouration, infection, and healing. Incise

locally to demonstrate suspected deep bruises. Bite marks should be swabbed. Sketches, diagrams, or photographs of important injuries are often necessary. Where indicated, take appropriate specimens for histological or bacteriological examinations).

B. HEAD & NECK

- (1) **Scalp** : (Injuries including deep bruising):
- (2) **Temporal muscles** :
- (3) **Skull** : (Fractures, etc. Note connection between skull and first two vertebrae).
- (4) **Brain, meninges and cerebral vessels** : (Note presence of any abnormal smell. Note the type and amount of intracranial haemorrhage. Look for cerebral oedema, contusions, lacerations and aneurysms, esp. in circle of Willis).
- (5) **Eyes** : (Colour of irises and sclerae, pupils, artificial eyes, conjunctivae, eyelids, opacity of cornea, bleeding, petechiae).
- (6) **Orbital, nasal, accessory nasal, and aural cavities** : (Examined only if special indications present).
- (7) **Mouth, tongue, and pharynx** : (Oral mucosa, dentition, oral and nasal discharges, their colour and odour).
- (8) **Neck, larynx, thyroid, and other neck structures** : (If there is suspicion of neck trauma, remove brain and thoracic organs first to achieve a bloodless field. A careful flap dissection of the neck should always be made and all neck structures, esp. hyoid bone, thyroid cartilage and laryngeal cartilages carefully examined to investigate the possibility of being due to acute respiratory obstruction, e.g. strangulation, hanging, etc).

C. CHEST

- (1) **Ribs and chest wall** : (Shape and stability, fractures, breasts, nipples and pigmentation; demonstrate pneumothorax).
- (2) **Diaphragm** : (Note level on right and left).
- (3) **Mediastinum and thymus** :
- (4) **Oesophagus** : (Open and look for any pathology or foreign bodies).
- (5) **Trachea and bronchi** : (All the larger air passages should be opened and carefully examined for the presence of foreign material and any pathology).
- (6) **Pleural cavities** : Right : Left:
- (7) **Lungs** : (Note, colour, distended or collapsed:

dry, crepitant, soft, oedematous, congested, friable, inelastic, consolidation, emphysematous, atelectoid, exude frothy blood, blood stained purulent matter, adhesions, haemorrhages, Tardieu spots, infarction, scars, tubercles on surface, tumours, etc. Look for thrombi and emboli in pulmonary arteries. In new born infants a full hydrostatic test should be carried out).

- (8) **Heart and pericardial sac** : (Open all chambers of the heart : dissect the coronary arteries and look for thrombi and atheroma; cut into the myocardium. Examine valvular rings and cusps. Examine auricular appendages for thrombi, Measure thickness of auricular and ventricular walls. Look for blood clots and other pathology. In sudden obscure deaths the possibility of air or plumonary artery embolism should not be overlooked).
- (9) **Large blood vessels** : (Abnormalities in the large arteries and veins, e.g. atheroma, aneurysm formation, thrombosis, etc).

D. ABDOMEN

- (1) **Abdominal wall** : (Bulging, pigmentation, abnormalities).
- (2) **Peritoneal cavity** : (Blood, pus, fluid, adhesions, disease, etc).
- (3) **Stomach and contents** : (Ligate cardiac and pyloric ends of stomach and remove en-masse. Place in clean tray and slit open along greater curvature of stomach. Note nature of stomach contents, state of digestion, description of identifiable particles, and presence of any abnormal odour, foreign and suspicious matter, Examine mucous membrane for congestion, haemorrhage, ulcers, perforation, etc).
- (4) **Small intestine** : (Place in clean tray and slit open along mesenteric attachment; Examine mucous membrane for congestion, inflammation, erosions, ulcers, etc., Examine mesenteric vessels for disease, thrombi or emboli).
- (5) **Large intestine, appendix and mesentery** : (Open along anterior taenia; look for findings as in small intestine).
- (6) **Liver, gall-bladder, and biliary passages** : (Weight, size, colour, consistency, pathology, injury, etc).
- (7) **Pancreas** : (Haemorrhage, fat necrosis).

- (8) **Spleen** : (Note colour, size, weight, shape, consistency, capsule (wrinkled, thick, adherent), rupture, wounds, etc).
- (9) **Kindneys, renal pelvis, ureters** : Right: Left: (Examine renal arteries for thrombi, emboli and atheroma; strip capsule. Note size and weight. Examine cortex and medulla. Exmine renal pelvis for calculi and inflammation).
- (10) **Adrenals** : (Haemorrhage).
- (11) **Pelvic walls** :
- (12) **Urinary bladder and urethra** : (Calculi, cystitis, etc).
- (13) **Genital organs** : (In suspected sexual assaults, remove external genitalia, rectum and anus, en block and dissect. Take relevant swabs prior to this procedure).

E. SPINE

- (1) **Spinal column and spinal cord** : (Palpate and manipulate the spine after the removal of all internal organs for presence of fractures and dislocations. The spinal cord need only be opened and the cord examined if special indications are present).

F. ADDITIONAL OBSERVATIONS

- (1) Samples retained for histology, microbiology and other investigations.
- (2) Results of ancillary investigations, such as radiology, odontology, anthropology, etc.

E- SPECIMEN REMOVED FOR CHEMICAL ANALYSIS

Sl. No.	Nature of specimen	Nature&quantity of preservative added.
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- (1) Stomach and contents :
- (2) Small intestine and contents :
- (3) Liver : (Not less than 1/2 kg) :
- (4) Kidney (Half of each) :
- (5) Blood 30 ml. from peripheral veins :
- (6) Urine 30 ml :
- (7) Any other organ :

Post-mortem concluded at A.M./P.M on

OPINION AS TO THE CAUSE OF DEATH

- (a) The approximate time of death
- (b) Reserved pending report of
- (c) The cause of death, to the best of my knowledge and belief was

Hospital : (Signature)

Date : Name :

Designation :

POSTMORTEM CERTIFICATE (Short opinion)

P.M. NO. : _____ Date : _____
 Regarding the body of male/female named
 _____ aged about _____ years,
 received on _____ at _____ A.M./P.M. from
 _____ of police of P.S. _____ with his
 letter No. _____ dated _____ sent through
 P.C. No. _____

P.M. was commenced at _____ A.M./P.M. and
 concluded at _____ A.M./P.M.

Opinion as to the cause of death.

Place : _____ Signature : _____
 Date : _____ Name : _____
 Designation : _____

**AUTHORISATION FOR PATHOLOGICAL
AUTOPSY**

I _____ bearing the relation of
 _____ and being next of kin to _____
 a deceased patient, authorise the authorities of the
 _____ to perform an examination of said
 body with the object of ascertaining the direct and
 indirect causes of death, and to the retaining of
 such tissues and organs as the doctor deems
 necessary for complete examination.

1. Full autopsy.
 2. Restricted autopsy :
- Witness to signature _____ Signature of next of kin _____

APPENDICES

**LETTER FROM MEDICAL OFFICER TO THE
 DIRECTOR, FORENSIC SCIENCE LABORA-
 TORY, REQUESTING FOR CHEMICAL
 ANALYSIS TO BE DONE.**

Instructions : (1) Care should be taken to ensure that all necessary information regarding individual samples submitted is included. (2) The specimen or sample should be well protected against contamination from outside sources. (3) The samples should be wrapped in clean, white glazed paper, or in a cellophane. (4) Small samples, such as hair, fibres, dusts, etc. should be packed in glass tubes or in cellophane card envelopes. (5) Liquid should be packed in clean glass-stoppered bottles. (6) Each specimen must be in a separate package. (7) Each specimen should be sealed and labelled. (8) If any specimen is required to be returned, a note to this effect may be made in the remarks column.

Letter No. _____ Hospital : _____
 Place : _____ Date : _____

To
 The Director,
 Forensic Science Laboratory,
 Govt. of _____
 Sir,

I am forwarding herewith the material objects mentioned below through (name) _____
 P.C. No. _____ of police station _____
 for chemical examination and certificate. The relevant details of the case are given below. I request you to kindly analyse the materials and

forward the report to me at the earliest.

Relevant particulars

- (1) Post mortem No. : _____ Date : _____
 - (2) Name of deceased : _____ Age : _____
 - (3) Crime No. : _____ of _____ Police Station : _____
 - (4) Material objects :
 - (a) Stomach and upper part of intestine with contents.
 - (b) Liver 1/2 kg.
 - (c) Half of each kidney.
 - (d) Blood
 - (e) Urine
 - (f) Any other material
 - (5) Method of preservation
 - (a) Rectified spirit/saturated saline (for a, b and c)
 - (b) Sodium fluoride (for d and e).
 - (6) Mode of packing : Collected in glass bottles, wrapped with paper, tied and sealed.
 - (7) Specimen seal used enclosed.
 - (8) Inquest report enclosed.
 - (9) Post mortem report enclosed.
 - (10) Authorisation letter : (enclosed/not enclosed)
 - (11) Examination required : Detection of poison.
- In connection with the examination of trace evidence (hair, stains, etc.), furnish the following information.**

- (I) Nature of crime :
- (II) Facts of medicolegal importance in connection with the case :
- (III) List of articles sent for examination :
 Sl.No. :

Date : Designation :

**LETTER FOR AUTHORISATION
FOR CHEMICAL EXAMINATION OF VISCERA**

Office of the Dated :
To : The Principal/First/Second/Additional Judicial
First Class Magistrate.
Sir,

Sub : Authorisation for Chemical Examination
of Viscera.

Kindly authorise the Director, F.S.L.
Government of to examine the viscera
of P.M. No. dated

The case has been sent by the Sub-inspector of
police of police station, vide his letter
No. dated

Place : Yours faithfully,
Date : Signature :
Name :
Designation :

**FINAL OPINION OF THE CAUSE OF
DEATH AFTER F.S.L. REPORT**

To : The Magistrate
Sir,

Sub : Final opinion - Cause of death - Deceased
- Furnished.

Ref : (1) Postmortem Certificate No.
dated
(2) FSL Report No. dated
(3) Cr. No. of P.S.
dated

On reviewing the case in the light of Forensic
Science Laboratory report and postmortem findings,
I am of the opinion that the deceased by the name
..... aged about years, would appear
to have died of

Place : Signature :
Date : Name :
Designation :

Copy to : The Sub-inspector of Police of P.S.
for information.

PROFORMA FOR EXHUMATION

Instructions : (1) Describe clothing. (2) Determine
sex, age and stature. (3) Describe identifying marks
if any. (4) Conduct autopsy in the routine manner
and note all the findings. (5) Preserve viscera for

chemical analysis. (6) Collect samples of earth
(about half kg) from above, below and from each
side of the body and any fluid or debris in the coffin.
(7) If only skeleton is present, collect all bones and
send them to the expert in sealed and labelled
packets (8) The body should be handed over to the
police after autopsy.

Requisition from Magistrate of vide
his letter No. dated
Letter No. dated from
of police of P.S.

- (1) Time of departure :
- (2) Time of arrival at the place of burial :
- (3) Persons present at exhumation (names and
addresses) :
- (4) Persons identifying the place of burial (names
and addresses) :
- (5) Description of the burial place and grave :
- (6) Location : Length : Breadth :
- (7) Height : Covered with :
- (8) Stone inscription if any :
- (9) Inquest conducted by :
- (10) Grave identified by :
- (11) Officers present at the time of exhumation :
- (12) Condition of soil of burial place and surrounding
area :
- (13) Grave digging started at :
- (14) Samples of earth from (a) above, (b) below, and
(c) within the coffin :
- (15) Description of coffin if any :
- (16) Body removed from the grave at :
- (17) Description of clothes :
- (18) Persons identifying the clothes (names and
addresses) :
- (19) Persons identifying the body (names and
addresses) :

P.M. No. date
P.M. commenced at :
P.M. findings :
P.M. concluded at :

Approximate time of death :
Opinion as to the cause of death :
Place : Signature :
Date : Name :
Designation :

ESSENTIALS OF FORENSIC MEDICINE

ANNEXURE 1 (A)

FORM NO. 4

MEDICAL CERTIFICATE OF CAUSE OF DEATH

(Hospital in-patients. Not to be used for stillbirths)

To be sent to Registrar along with Form No. 2 (Death Report)

Name of the Hospital

I hereby certify that person whose particulars are given below died in the hospital in Ward No.
on at A.M./P.M.

Cr. No. Date of Admission				For use of Statistical Office
Name of Deceased S/W/D/of				
Address				
Sex	Age at Death			
	If 1 year or more, age in years	If less than 1 year, age in months	If less than 1 month, age in days	If less than 1 day age in hours
1. Male 2. Female				
Cause of Death			Interval between onset & death approx.	
I. Immediate cause State the disease, injury or complication which caused death, not the mode of dying, such as heart failure, asthenia, etc. Antecedent cause Morbid conditions, if any, giving rise to the above cause, stating underlying conditions last.		(a) due to (or as a consequences of
		(b) due to (or as a consequences of
II. Other significant condition contributing to the death but not related to the disease or conditions causing it.		(c)
Manner of Death (1) Natural. (2) Accident. (3) Suicide. (4) Homicide. (5) Pending investigation			How did the injury occur?	
If deceased was a female, was pregnancy the death associated with? If yes, was there a delivery ?			(1) Yes (2) No (1) Yes (2) No	

Name and signature of the Medical Attendant certifying the cause of death
Date of verification

(To be detached and handed over to the relative of the deceased)

Certified that Shri/Smt./Kum S/W/D/ of Shri CR. No.
R/o was admitted to this hospital in
ward on and expired onDoctor's Signature
(Medical Supdt. Name of the Hospital)

ORGAN DONOR CARD**FRONT SIDE**Regn No.

I son/daughter/wife of
 in the hope that I may help other,
 hereby make this anatomical gift, if medically acceptable
 to take effect upon my brain death. I hereby wish
 to donate the following organs : Heart, Lungs, Kidneys,
 Liver, Corneas & Special wishes, if
 any

BACK SIDE

Signed by the donor in the presence of two witnesses

Signature of donor with date Date of birth of donor

Address of the donor Telephone No. Blood group

Witness

Witness

APPENDIX VII**MEDICAL CERTIFICATES AND REPORTS****INTIMATION OF ACCIDENTS AND INJURIES****TO POLICE**

- (1) Name of patient : Age : sex :
- (2) Address and residence :
- (3) Brought by :
- (4) Place at which the injury or accident occurred:
- (5) Nature of injury or accident (simple or grievous):
- (6) Alleged cause :
- (7) Ward in which admitted/treated as out-patient:
- (8) Whether dying declaration necessary :
- (9) Hospital/Nursing Home :
- (10) Time of despatch of intimation to the Police/Magistrate.

Place :

Signature :

Date :

Name :

Designation :

ACCIDENT REGISTER

No Date and hour

- (1) Name
- (2) Age
- (3) Sex
- (4) Caste
- (5) Occupation
- (6) Address and residence
- (7) Identification marks : (1) (2)
- (8) By whom brought
- (9) Consent (signature or thumb impression)
- (10) Police informed or not
- (11) Accompanying P.C.No. and P.S.
- (12) Brief history
- (13) Dying declaration required or not
- (14) If so, state action taken
- (15) Examination of clothes
- (16) Nature of injuries and treatment (State simple or grievous)
- (17) Signs of intoxication
- (18) If admitted as in-patient date and time
- (19) Date of discharge
- (20) Condition on discharge
- (21) Date of sending case for radiological examination and P.C.No.
- (22) Date of receiving the report from radiologist

(23) Radiological findings

Place :

Signature :

Date :

Name :

Designation :

WOUND CERTIFICATE

INSTRUCTIONS : (1) Obtain written consent for examination and investigations. (2) Examine without delay at any time of day or night. (3) If treated as out-patient, it should be noted in the report. (4) Admit if injuries are serious. (5) If death is imminent, arrange for dying declaration. (6) Carry out immunisation when necessary. (7) All forms filled for laboratory investigations should be labelled by the words MLC. (8) Inform police before discharging against advice. (9) In case of discharge or death in hospital, inform the police without delay and do not issue death certificate. (10) If a person is brought dead to the hospital, do not examine wounds, inform police and do not hand over the body to the relatives. Fill death certificate form or note on the out-patient ticket without

giving cause of death. (11) If the investigating officer gives requisition for any clarifications regarding any points in the report, the answers should be given in writing (S.197, I.P.C. and S.161, Cr.P.C.). (12) Oral statements made to the police and recorded by the police, should not be signed (S.162, Cr.P.C.). (13) If the investigating officer requires any documents regarding the injured person, either original or xerox copy, it should be given and a receipt obtained. (14) The doctor can be summoned to police station for recording a statement if the investigation demands (S.160, Cr.P.C.).

Wounds or injuries found on the person of a male/female calling himself/herself
 aged years, an inhabitant of
 who was sent with (letter/memo No.)

dated from P.S. and accompanied by (name, number of P.C. of P.S.) for report as to certain injuries said to have been caused on and to be due to

Identification marks : (1) (2)

Content of the individual for examination

Signature or thumb impression of the person Identified by constable No. Name P.S.

The injured person was first seen by the undersigned at A.M./P.M. on (date) and the examination was commenced at A.M./P.M. on (date) when the following injuries were found:

1	2	3	4	5	6	7
Nature of injury, i.e. whether a abrasion, cut, bruise, burn, stab, fracture or dislocation, etc.	Size of each injury in cms. i.e., length, breadth and depth	On what part of the body inflicted	Whether simple or grievous	By what kind of weapon inflicted	Whether the weapon was dangerous or not	Remarks, (age of wound, in-patient or out-patient, etc.)

I am of opinion that (injuries are simple grievous or likely to be fatal)

Station: Signature :
Date : Name :
Designation :

DISCHARGE AGAINST ADVICE

Hospital : Reg. No. :
Bed No. : Ward :
Name of the patient :
I am responsible for leaving/taking the above patient out of the hospital against the advice of the doctor.

Date : Signature :
Relationship :

Witness : (1) (Name, Signature) Relationship
(2)

AGE ESTIMATION

INSTRUCTIONS : (1) Obtain written consent for examination and for taking X-rays. (2) For confirmation of age as determined by dental examination, take X-rays of : (a) Between 6 to 12 years : elbow and wrist joints. (b) Between 13 to 16 years : elbow and pelvis. (c) 16 to 17 years: elbow and ankle. (d) 17 to 18 : hip. (e) 18 to 19: knee and shoulder. (f) 18 to 20 : iliac crest. (g) 21 : ischial tuberosity and inner end of clavicle. (3) All forms filled for X-rays should be labelled by the words MLC. (4) Note at least two identification marks, preferably on exposed areas of the person. (a) In the case of mole, note colour, size, shape, hairy or not, raised or not and exact anatomical location. (b) In case of scar, note colour, length, width, shape, fixed or free, smoothness or irregularity of surface, presence or

absence of glistening and tenderness, direction and exact location. (c) In case of tattoo mark, note colour, design, size and situation and make a sketch.

Requisition from of police of P.S. vide his letter No. dated and accompanied by (name & number of P.C.) of P.S. for determination of age.

- (1) Name of the individual :
- (2) Sex :
- (3) Parent's or guardian's name :
- (4) Address :
- (5) Occupation :
- (6) Caste :
- (7) Married or single :
- (8) Age as alleged by :
 - (i) Individual to be examined :
 - (ii) Person or police accompanying :
- (9) Person accompanying or brought by :
- (10) Time and place of examination :
- (11) Consent of the individual for examination :
- (12) Signature of the individual consenting or his/her left thumb impression :
- (13) In the case of minors, consent of the guardian and his/her signature or left thumb impression:
- (14) Name of female attendant/nurse present at the time of examination :
- (15) Date and time of examination :
- (16) Marks of identification : (1) (2)

PHYSICAL EXAMINATION

- (1) Height : (2) Weight :
- (3) Chest girth at the level of the nipples :
- (4) Abdominal girth at the level of the navel :
- (5) General build and appearance :
- (6) Voice :

(7) Teeth :

R (S) 8 7 6 5 4 3 2 1 (S) 8 7 6 5 4 3 2 1

L (S) 1 2 3 4 5 6 7 8 (S) 1 2 3 4 5 6 7 8

T : Temporary P : Permanent

(S) : Space after teeth

(8) Hair :

Scalp :

Beard :

Moustache :

Axillary :

Pubic :

Body :

(9) Mammæ :

Development of breasts : milk in :

(10) Generative organs :

Development of genitals :

(11) Onset of puberty :

(i) Date of menarche :

(ii) Regularity of menses :

(12) Date of sending case for radiological examination and P.C.No. :

(13) Number and region of X-rays taken :

(14) Date of receiving the report from the radiologist:

(15) Radiological findings :

(16) Opinion of age :

Station :

Signature :

Date :

Name :

Designation :

AGE CERTIFICATE

Name of individual : Sex

Cr.No. of P.S. dated

accompanied by P.C.No.

From physical, dental, and radiological examination of bearing the

identification marks : (1)

(2)

I am of opinion that the individual is aged about years.

Station :

Signature :

Date :

Name :

Rank :

**PROFORMA FOR EXAMINATION OF SEXUAL OFFENCES
EXAMINATION OF THE VICTIM OF RAPE**

Instructions : (1) Obtain written consent for examination and collection of specimens of blood, etc. and to supply copies of all medical reports to the police. (2) With a cotton swab take material from introitus, posterior fornix and cervical os and make four slides, and allow them to dry for two to three minutes. (3) Keep the same swab in test tube for acid phosphatase determination. (4) Insert a second swab in a test tube containing small amount of normal saline, and examine the fluid for motile spermatozoa. (5) Comb pubic hair and place loose hair in labelled envelope. (6) Cut sample of pubic hair (10 to 12 hairs) and place in labelled envelope. (7) Obtain blood 5 ml. (plain) for grouping and DNA profile, and 5 ml. (sodium fluoride) for alcohol and drugs and venereal disease. (8) Obtain fingernail scrapings and place in labelled envelopes. (9) Collect any loose hair or fibres found on the person or clothes. (10) Collect dried bloodstains and indicate the site from which collected. (11) Collect material from cervix for gonorrhoeal infection. (12) Obtain swabs from bite marks. (13) Preserve garments having suspected seminal or blood stains after drying them. (14) In most young women a finger may be passed into vagina although the hymen is intact. (15) If the

vaginal opening is enough to admit two fingers easily and the hymen shows old tears, it indicates that the woman is used to sexual intercourse.

Appearances found on the person of female calling herself age stated years, an inhabitant of who was sent with letter/memo No. dated from and accompanied by (name and number of P.C. of P.S.) for report as to the result of examination of person for certain injuries or appearances said to have been caused on to be due to alleged rape. Identification marks : (1) (2)

The person was seen by the undersigned on (date) at (place of exam) and the examination was commenced at A.M./P.M. on (date) when the following were found.

Preliminary Particulars :

(1) Name of the individual :

(2) Parent's or guardian's name :

(3) Address :

(4) Occupation :

(5) Caste :

(6) Age as alleged by the victim :

(7) Person accompanying or brought by :

- (8) Consent of the individual for examination :
- (9) Signature of the individual consenting or her left thumb impression :
- (10) In the case of minor, consent of the guardian and his/her signature or thumb impression :
- (11) Married or single :
- (12) Name of female attendant/nurse present at the time of examination :
- (13) History as given by police :

History (From victim) :

- (1) Age : (2) Gravidity :
- (3) Age of menarchy :
- (4) Date of last menses :
- (5) Whether pregnant :
- (6) Most recent coitus prior to alleged assault :
Date : Time : Condom used or not :
- (7) Patient's statement, whether she is a virgin :
- (8) Is she suffering from any illness and taking any medicines :
- (9) History of any venereal disease (past or present) :
- (10) History of emotional illness :
- (11) Previous vaginal surgical procedure :
- (12) Use of alcohol or drugs in twenty-four hours prior to alleged assault. If so amount and time of ingestion :
- (13) (a) Date and time when the victim first made complaint to the police :
(b) Date and time when the rape was said to have been committed :
(c) Place where it was committed :
(d) Exact circumstances under which the rape was committed, i.e., whether the parties were standing or lying on the ground :
(e) Whether she was menstruating at the time :
(f) Whether she was sensible during the whole time the offence was committed or under the influence of alcohol or other intoxicants :
(g) Whether she uttered any cries or was she terrified :
(h) Did penis penetrate vulva ?
(i) Did assailant wear condom ?
(j) Since alleged assault has the victim :
(1) Douched : (2) Bathed :
(3) Defaecated : (4) Urinated :
(5) Changed clothes :
(k) General feeling of those accompanying the female towards herself and towards the accused :

Physical Examination :

- (1) B.P. : Pulse : Temp :
Wt : Height :
- (2) General appearance :
- (3) (a) Secondary sexual characters :
(b) Breasts : development, areola, nipple, milk in :
- (4) Emotional status :
- (5) Intelligence :
- (6) Gait :
- (7) Clothing worn at the time of alleged rape :
(a) Blood stains :
(b) Seminal stains :
(c) Other discharge :
(d) Foreign material :
(e) Hair : (f) Tears :
(g) Mud, dust, soil, grass stains, etc. :
- (8) Body surface (injuries to breasts, cheeks, lips, thighs, genitals etc.) :
a) Scratches : b) Bruises :
c) Lacerations : d) Stains :
e) Foreign hair and bodies :
- (9) Mouth :
- (10) Fingernails (damage, epithelial cells, foreign material, etc.) :
- (11) Genitals :
(a) Pubic hair, length, matted or not :
(b) Vulva (injuries and stains) :
(c) Labia minora :
(d) Hymen (tears, recent or old) :
(e) Vagina (digital and speculum exam) :
(f) Fourchette (intact or torn) :
(g) Perineum (tears, stains, scratches, foreign hair) :
(h) Cervix :
- (12) Is venereal disease present :
- (13) Smears taken from vagina, cervix, urethra, sores :
(a) Number :
(b) Number of slides :
(c) Gram's stain :
(d) Stain for spermatozoa :
- (14) Any other findings :
- (15) Material sent to the laboratory :
- (16) Results of laboratory procedures :
(a) Pregnancy test :
(b) Serology :
(c) Gonorrhoeal infection :
(d) Spermatozoa :

- (e) Acid phosphatase :
- (f) Grouping of blood and semen :
- (g) Hair examination :

Collection of Evidence :

- (1) Blood in two tubes for serology and grouping :
- (2) Fingernail scrapings :
- (3) Loose pubic hair :
- (4) Cut pubic hair :
- (5) Hair, fibres and blood stains on body and clothing :
- (6) Vaginal material for live spermatozoa :
- (7) Four slides from vaginal material :
- (8) Cervical material for gonorrhoea :

- (9) Vaginal secretion on two cotton swabs :

(a) Semen typing : (b) Acid phosphatase :

Opinion : (1) There are signs/no signs of recent vaginal penetration (if hymen is torn and external genitals show injuries). (2) There are signs of recent sexual intercourse (if semen is present in vagina). (3) There are signs of general physical injuries, and/or intoxication.

The signs are consistent/inconsistent with the history given.

Place : _____ Signature : _____
Date : _____ Name : _____
Designation : _____

EXAMINATION OF ACCUSED OF RAPE/SODOMY

Instructions : (1) Obtain written consent for examination, and collection of specimens of blood, etc. and to supply copies of all medical reports to the police. (2) Collect blood for comparison with semen type found in the victim. (3) In the case of accused in a rape case, swab from coronal sulcus, prepuce, penile shaft for blood comparison with the victim's blood. (4) With a cotton swab wipe glans penis, prepare two slides and dry for 2 to 3 minutes for vaginal and cervical cells. (5) Obtain penile washings for vaginal and cervical cells. (6) Look for smegma on corona glandis. It gets rubbed off during intercourse and usually requires about 24 hours to collect. (7) In the case of accused in a sodomy case, penis has peculiar smell of anal glands and may contain traces of lubricant and faecal matter. Fraenum may be torn and abrasion on prepuce and glans. Faecal soiling, blood and foreign hairs may be found on coronal sulcus. (8) In the case of buccal coitus, faint teeth marks and abrasions may be seen on penis. (9) Urethral discharge for gonococcal infection. (10) Comb pubic hair and place loose hair in an envelope. (11) Obtain fingernail scrapings and place in labelled envelope. (12) Preserve garments having suspected seminal stains.

Preliminary particulars and reference, etc. :

As in the case of the victim.

History :

- (1) Brief description of assault : Record general history and omit history of specific incident. Find out how injuries found on body were caused.
- (2) Date and time of assault:

- (3) Is he suffering from any illness and taking any medicines?
- (4) Use of alcohol or drugs in 24 hours prior to alleged assault, if so amount and time of ingestion :
- (5) Past illness, surgical operations, serious accidents :
- (6) Consenting intercourse with any woman within previous 24 hours :

Physical Examination :

- (1) B.P.: _____ Pulse: _____ Temp: _____
Wt: _____ Height: _____ General build: _____
- (2) General appearance and emotional status :
- (3) Clothing (changed or not):
 - (a) Blood stains:
 - (b) Seminal stains:
 - (c) Foreign material:
 - (d) Hairs:
 - (e) Tears:
 - (f) Cosmetic contact traces:
 - (g) Mud, soil, grass, etc. :
- (4) Fingernails (damage, epithelial cells, foreign material, etc.):
- (5) Influence of alcohol or other intoxicant:
- (6) Injuries found on body (scratches, bruises, bite marks, etc.):
- (7) Genitals (development with special reference to potency):
 - (a) Pubic hair: length, matted or not:
 - (b) Penis: Length when flaccid:
Length when erect:
 - (c) Injuries : (d) Blood, semen, lubricant, faecal matter:
 - (e) Smegma

- (f) Prepuce (abrasions, female pubic hair):
 (g) Coronal sulcus (faecal soiling, blood and pubic hair):
 (h) Circumcised or not:
 (i) Fraenum (tears):
 (j) Scrotum and testis (development, injuries):
- (8) Anal examination:
 (9) During alleged assault:
 Did penis penetrate vagina/rectum?
 Did assailant had orgasm?
 Did assailant wear condom?
- (10) Since alleged assault:
 Bathed : Urinated :
 Defaecated :
- (11) Is venereal disease present?
 (12) Material sent to laboratory:

(13) Results of laboratory procedures:

(14) Any other findings:

Collection of Evidence :

(1) Blood in two tubes for serology and grouping and for drug screening. (2) Perianal swab. (3) Rectal swab. (4) Oral swab. (5) Loose pubic hair. (6) Hair, fibres and blood stains on body and clothing. (7) Urethral discharge for gonorrhoea. (8) Fingernail scrapings. (9) Suspected dried seminal stains on the skin or clothing. (10) Penile washings (presence of vaginal epithelium).

Opinion : (1) There are no signs indicative of recent vaginal / anal penetration. (2) There are signs indicative of recent vaginal / anal penetration (presence of injuries, vaginal epithelial cells, lubricant or faecal stains on penis).

EXAMINATION OF THE VICTIM OF SODOMY

Instructions : (1) Obtain written consent for examination, and collection of specimens of blood, etc. and to supply copies of all medical reports to the police. (2) With a cotton swab wipe the perianal area, and put in a test tube for acid phosphatase determination. (3) Insert a cotton swab into the anal canal without touching the perianal area. Prepare two slides and dry for 2 to 3 minutes. (4) Place the same swab in a tube containing normal saline for acid phosphatase determination. (5) Insert a second swab in a test tube containing small amount of normal saline, and examine the fluid for motile spermatozoa. (6) Cut sample of pubic hair (10 to 12 hairs) and place in labelled envelope. (7) Obtain blood samples (two) for comparison with grouping of the semen and for serological tests. (8) Obtain fingernail scrapings and place in labelled envelopes. (9) Collect any loose hair or fibres found on the person or clothes. (10) Collect dry blood stains and indicate the site from which collected. (11) Collect material from anus for gonorrhoeal infection. (12) In buccal coitus, swab the mouth of the patient, especially the gums and pharynx with a cotton swab, smear on a slide and dry. (13) Place the same cotton swab in a tube containing normal saline for acid phosphatase.

Appearances found on the person of a male/female calling himself/herself age stated years, an inhabitant of who was sent with letter/memo no

..... dated from and accompanied by for report as to the result of examination of person for certain injuries or appearances said to have been caused on to be due to alleged sodomy.

Identification marks : 1)
 2)

The person was seen by the undersigned on (date and time) and the examination was commenced at (date and time) when the following were found.

- (1) Name of the individual :
- (2) Parent's or guardian's name:
- (3) Address :
- (4) Occupation :
- (5) Caste :
- (6) Age as alleged by the victim:
- (7) Persons accompanying or brought by:
- (8) Consent of the individual for examination:
- (9) Signature of the individual consenting or his/her left thumb impression:
- (10) In the case of minor, consent of the guardian and his/her signature or thumb impression:
- (11) Name of the female attendant/nurse, present at the time of examination:

History (from victim)

- (1) Is he/she suffering from any illness and taking any medicines:
- (2) History of any venereal disease (past or present).
- (3) History of emotional illness:

- (4) Use of alcohol or drugs in 24 hours prior to alleged assault. If so amount and time of ingestion.
 - (5) Date and time when the victim first made complaint to the police:
 - (6) Date and time when sodomy was said to have been committed:
 - (7) Place where it was committed:
 - (8) Exact circumstances under which sodomy was committed, i.e. whether the parties were standing or lying on the ground.
 - (9) Whether he/she uttered any cries or was terrified.
 - (10) Whether he/she was sensible during the whole time the offence was committed or under the influence of alcohol or other intoxicants:
 - (11) Details of struggle or resistance :
 - (12) Use of any lubricant :
 - (13) Did penis penetrate anus? (degree of penetration) :
 - (14) Did assailant wear condom?
 - (15) Ejaculation during the act :
 - (16) Pain experienced at the time of act or subsequently :
 - (17) Any bleeding :
 - (18) Since alleged assault has the victim :
 - (a) Bathed or washed the anal area :
 - (b) Defaecated :
 - (c) Urinated :
 - (d) Changed clothes :
- Physical Examination:**
- | | | |
|------------|----------|---------|
| (1) B.P. : | Pulse : | Temp : |
| Wt : | Height : | Build : |
- (2) General appearance :
 - (3) Emotional status :
 - (4) Clothing worn at the time of offence : (a)
 - Blood stains. (b) Seminal stains. (c) Faecal stains. (d) Mud, dust, soil, grass stains, etc. (e) Foreign material. (f) Hair. (g) Tears.
 - (5) Marks of violence on the body (scratches, bruises, bite-marks, etc.).
 - (6) Any type of stains or foreign bodies on the body :
 - (7) Fingernails (damage, epithelial cells, foreign material, etc.) :
 - (8) Mouth (in buccal coitus) :
 - (9) Anal examination : (a) Inspection : Look for recent tears, stains due to semen, blood, faecal matter around the anus, scars, piles, condyloma, shaving of anal hair, smoothness or thickness of anal mucosa, depression of buttocks towards anus, etc. (b) Digital examination (assess tone and degree of dilatation of sphincter, discomfort or pain during examination). (c) Lateral buttock traction test. (d) Speculum examination (look for abrasions, contusions, lacerations, piles, fissures, wrinkles in anal mucosa, etc.).
 - (10) Any other findings.
 - (11) Specimens to be collected : (1) Blood. (2) Head hair. (3) Pubic hair. (4) Loose hair and fibres found anywhere on the body. (5) Swabs from any soiled areas of the skin. (6) Swabs from the anal and lower rectum. (7) Nail scrapings.
 - (12) Results of laboratory procedures:
- Opinion:** (1) Findings are not consistent with entry of a penis into anus. (2) Findings are consistent with entry of a penis into anus. (3) Sodomy has been committed (if semen is present in the anus).
- | | |
|--------|--------------|
| Place: | Signature: |
| Date: | Name: |
| | Designation: |

PROFORMA FOR EXAMINATION OF CASE OF IMPOTENCY/POTENCY

Appearances found on the person of a male/female calling himself/herself age stated years, an inhabitant of who was sent with letter/memo no dated from of police of P.S. and accompanied by (name and No. of P.C of P.S. for report as to the result of examination for potency/impotency.

- (1) Name of the individual :
- (2) Age :

- (3) Sex :
- (4) Address :
- (5) Occupation :
- (6) Brought by :
- (7) Date, time and place of examination :
- (8) Consent of the individual for examination : (Signature or left thumb impression) :
- (9) Marks of identification : (1) (2)
- (10) History of the case : (Diabetes, drug addiction, trauma, STD, etc. masturbation, night emissions, homosexual/sexual intercourse).

The person above noted was first seen by the undersigned at A.M/P.M. on and examination was commenced at A.M/P.M. on when the following signs were found.

Opinion : (1) Consumed alcohol and is under its influence (intoxicated) (2) Consumed alcohol, but is not under its influence. (3) Has not consumed alcohol

Place : Signature :
Date : Name :
Designation :

MEDICAL CERTIFICATE RECOMMENDED FOR LEAVE OR EXTENSION OF LEAVE

(Approved by the Central Govt. under section 33(m) of the Indian Medical Council Act, 1956, vide their letter No. F-17-4/64-MPT dated 23rd Oct., 1970)

Signature of applicant or L.T.I.

I, Dr. after careful examination of the case hereby certify that (name of patient) aged sex resident of , whose signature is given above is suffering from and I consider that a period of absence from duty of days with effect from is absolutely necessary for the restoration of his health.

Identification Marks : (1) (2)
Place : Signature, Name & Stamp of Dr.
Date : Reg. No.
Time :

MEDICAL CERTIFICATE OF FITNESS TO RETURN TO DUTY

Signature of applicant or L.T.I.
I, Dr. do hereby certify that I have carefully examined of the department whose signature is given above and find that he has recovered from his illness with which he was suffering since and is now fit to resume his duties in Govt. services w.e.f.
I also certify that before arriving at this decision, I have examined the original medical certificates and statement of the case (or certified copies thereof) on which leave was granted or extended and have taken these into consideration in arriving at my decision.

Identification Marks : 1) 2)
Place : Signature, Name & Stamp of Dr.
Date : Reg. No.
Time :

HEALTH AND AGE CERTIFICATE

I hereby certify that I have examined Sri a candidate for employment in office/department, and cannot discover that he/she has any disease (communicable or otherwise), constitutional weakness or bodily infirmity, except I do not consider this a disqualification for employment in the office of the Sri age is, according to his/her own statement years, and by appearance about years.
Signature of the candidate : Signature :
Station : Name :
Date : Designation :

APPENDIX IX

Useful Weights and Measures (Conversion Data)

1 grain = 60 milligrams or 0.06 gm.
1 gram = 60 millilitres or 1.000 mg. or 15.5 grains.
1 ounce = 28.35 grams or 8.5 drachms or 473.5 grains.
1 drachm = 3.5 ml. (approx).
1 pound = 16 ounces or 0.453 kilograms.
1 kilogram = 2.2 pounds.
1 stone = 14 pounds.
10 minims = 0.6 ml. (approx).
1 ml. = 17 minims (approx).

1 litre = 1.000 ml. or 35.125 ounces or 1.75 pints.
Teaspoon = 5 ml. (approx). Tablespoon = 15 ml. (approx).

To convert pounds to kilograms (approx), multiply by 5 and divide result by 11.

To convert kilograms into pounds (approx), multiply by 11 and divide result by 5.

To convert feet into centimetres multiply by 30.5.

1 inch = 2.5 cm. (approx).

1 metre = 100 cm.

To convert centimetres into inches (approx), divide by 2.5.

To convert inches into centimetres (approx), multiply by 5 and divide by 2.

To convert feet into centimetres, multiply by 30.5.

Body temperature = 37°C or 98.4°F

Rectal temperature is about 1.5°F more than mouth temperature.

To convert Fahrenheit to centigrade, subtract 32 and multiply by 5/9.

To convert centigrade to Fahrenheit, multiply by 9/5 and add 32.

WEIGHTS AND MEASUREMENTS OF ORGANS IN ADULTS

Brain : 1400 grams (males); 1275 grams (females); 1.4% body weight.

Spinal cord : 27 to 28 grams; length 45 cm.

Pituitary : 0.5 to 0.6 g; size 2.1 x 1.4 x 0.5 cm.

Pineal gland : 0.1 to 0.18 g.

Heart : 300 g. (males); 250 g. (females); 0.4 to 0.45% body weight. Length 12.5 cm; Width 9 to 10 cm. (at atrioventricular groove).

Thickness of walls of atria : 1 to 2 mm.

Thickness of walls of right ventricle : 3 to 5 mm.

Thickness of walls of left ventricle : 10 to 15 mm.

Circumference : 24 to 25 cm.

Circumference of aortic valve : 7.5 cm. (6 to 7.5 cm.)

Circumference of pulmonary valve : 8.5 cm. (7 to 9 cm.)

Circumference of mitral valve : 10 cm. (8 to 10.5 cm.)

Circumference of tricuspid valve : 12 cm. (10 to 12.5 cm.)

Thyroid : 20 to 40 g; size 5 to 7 x 3 to 4 x 1.5 to 2.5 cm.

Parathyroids : 0.12 to 0.18 g.; **Thymus** 15 to 40 g.

Right lung : 360 to 570 g; mean 450 g;

Both lungs : 1% of body weight.

Left lung : 325 to 480 g; mean 375 g.

Trachea : 11 to 12 cm.; **Right bronchus** 2.5 cm.; **Left** : 3.5 to 5 cm.

Liver : 1400 to 1500 g; 1.8% of body weight. Size: 30 x 18 x 9 cm.

Spleen : 150 to 200 g; 0.16% of body weight.

Kidney : 130 to 160 g. (males); 120 to 150 g.

(females); size 11 to 12 x 5 to 6 x 3 to 4 cm.

Pancreas : 90 to 120 g; size : 23 x 4.5 x 3.8 cm.; 0.1% body weight.

Testis : 20 to 27 g; size : 4 to 5 x 2.5 to 3.5 x 2 to 2.7 cm.

Prostate : 15 to 20 g; size : 3.6 x 2.8 x 1.9 cm.

Uterus : virgin : 30 to 40 g; size : 7.8 to 8 x 3.4 to 4.5 x 1.8 to 2.7 cm. **Parous** : 100 to 120 g; 8.7 to 9.4 x 5.4 to 6.1 x 3.2 to 3.6 cm.

Ovary : 7 g; size : 2.7 to 4.1 x 1.5 to 0.8 cm.

Suprenals : 5 to 6 g.

Pharynx : 11 to 12 cm; **Oesophagus** : 25 cm.

Stomach : length 25 to 30 cm. Weight : 300 g; capacity 1100 to 1200 ml.

Small intestine : length 550 to 650 cm; weight 800 to 900 g.

Duodenum : 25 to 30 cm; **Jejunum** (upper 2/5); Ileum (lower 3/5)

Bile ducts : 7.5 cm.

Large intestine : length 150 to 170 cm; weight: 600 g; **Appendix** 7.5 to 10 cm.

Caecum : 6 to 7 cm long; **Ascending colon** : 20 cm; **Transverse colon** : 50 cm.

Descending colon : 12 to 15 cm; **Pelvic colon** : 40 to 45 cm; **Rectum** : 12 to 15 cm.

Anal canal : 2.5 to 4 cm.

Inguinal canal : 3.5 cm.

Thoracic duct : 40 to 45 cm.

Bladder capacity : 250 ml; **Ureter** : 25 cm.

Male urethra : 20 to 25 cm; prostatic 2.5 to 4 cm; membranous 2 cm; spongy and penile 15 to 20 cm.

Female urethra : 2.5 to 4 cm.

Vas deferens : 40 to 45 cm.

Uterine tubes : 10 to 12 cm.

Vagina : anterior wall 7.5 cm; posterior wall 10 cm.

Placenta : 500 g; size : 16 to 20 x 2.5 to 3 cm.

Bones : 11.6% of body weight.

Skeletal muscle : 28.7% of body weight.

Fat : **Males** : 20 to 25%; **Females** : 25 to 30% of body weight.

Specific gravity : **Human body** : 1.08; **Bone**: 2.01; **Fat** : 0.92.

The child's brain attains mature size and weight at about five years of age.