

## **II. Short Notes (10 × 5 = 50 marks)**

### **1. National Medical Commission (NMC)**

#### **Definition**

The National Medical Commission (NMC) is the statutory regulatory body for medical education and practice in India, established under the National Medical Commission Act, 2019, replacing the Medical Council of India (MCI). It aims to ensure quality medical education, ethical medical practice, and availability of competent medical professionals.

#### **Functions of NMC**

1. **Regulation of medical education** - Undergraduate, postgraduate, and super-specialty education
2. **Assessment and accreditation** - Medical institutions and courses
3. **Maintenance of National Medical Register** - Registration of medical practitioners
4. **Regulation of professional conduct** – issuing warning notice.
5. **Promotion of medical research and competence**
6. **Ensuring uniform standards** across India

#### **Bodies Under the National Medical Commission**

1. **Undergraduate Medical Education Board (UGMEB)** - Regulates MBBS education, curriculum, and training
2. **Postgraduate Medical Education Board (PGMEB)** - Regulates MD/MS/PG medical education
3. **Medical Assessment and Rating Board (MARB)** - Grants permission and assesses medical colleges
4. **State Medical Councils (SMCs)** under NMC supervision

#### **Medico-Legal Importance**

1. **Regulates professional conduct** - Enforces ethical guidelines and standards of care
2. **Disciplinary action against negligence** - Suspension or cancellation of medical license
3. **Uniform medical standards**
4. **Guidelines for consent, certification, and records**
5. **Protection of patient rights** - Enhances transparency and trust

## 2. Forensic Entomology

### Definition

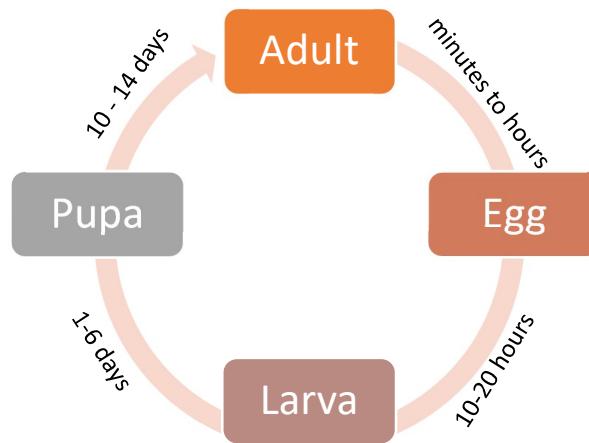
Forensic entomology is the branch of forensic science that deals with the study of insects and other arthropods associated with a dead body to assist in estimating the time since death, place of death, and circumstances surrounding death.

### Cycle of Insect Invasion (Succession on Dead Body)

Insects invade a corpse in a predictable sequence, known as insect succession:

1. **Fresh stage (0–24 hours)** - Blow flies (Calliphoridae), flesh flies (Sarcophagidae) arrive within minutes to hours for laying eggs.
2. **Bloated stage (1–3 days)** - Increased maggot activity (1st–2nd instar larvae)
3. **Active decay (3-10 days)** - Large numbers of maggots (3rd instar) and Predatory beetles
4. **Advanced decay (>10 days)** - Beetles dominate, Reduced fly activity
5. **Skeletal stage (weeks to months)** - Dermestid beetles

### Life Cycle of Flies



### Medico-Legal Importance

1. Estimation of time since death, especially in decomposed bodies
2. Helps determine place of death (indoor vs outdoor)
3. Indicates presence of wounds or trauma
4. Poisoning case – maggots activity may be delayed or no activity may present.

### 3. Difference between Strychnine Poisoning and Tetanus

Feature	Strychnine Poisoning	Tetanus
Cause / Etiology	Ingestion of strychnine (poison)	History of injury
Onset	Rapid	Gradual
Convulsions	All muscles are affected at a time	All muscles are not affected at a time
Lower jaw	No Starts in and not affect the jaw	Starts in and especially affects
muscle	Relaxed between fits	Rigid between fits
Chemical analysis	strychnine	No poison

#### Medico-Legal Importance

1. Usually accidental poisoning
2. Mimics natural death
3. Homicidal - differentiate from natural causes

#### **4. Mentally Ill Person Committing Homicide is Not Punishable – Reason**

Criminal liability requires both actus reus (guilty act) and mens rea (guilty mind). But Mentally ill persons cannot have intention to kill. According to **Section 22 of BNS (Section 84 of IPC)**:

*"Nothing is an offence which is done by a person who, at the time of doing it, by reason of unsoundness of mind, is incapable of knowing the nature of the act, or that it is wrong or contrary to law."*

#### **Mentally ill persons are not punishable because**

- a) **Lack of Mens Rea (Criminal Intent)** - Mentally ill persons may commit the act (actus reus) but cannot comprehend its wrongfulness (mens rea).
- b) **Incapacity to Understand Consequences** - Severe mental illness impairs ability to understand the nature of the act. Such persons cannot form intent to kill.
- c) **Protection Under Law** - Law recognizes that punishment is only justified when a person can differentiate right from wrong. Mentally ill individuals are considered incapable of moral or legal accountability. So according to law, criminal offence not happened.

**McNaughten's Rule** - A person suffering from mental illness is not criminally responsible for an offence, including homicide, if the following conditions are satisfied at the time of the act:

- a) The accused was suffering from a defect of reason.
- b) The defect of reason was due to disease of the mind.
- c) Because of this defect, the person Did not know the nature and quality of the act, or Did not know that the act was wrong or contrary to law.

As per this rule, A mentally ill person who fulfills McNaughten's criteria lacks the capacity to form mens rea. Hence, although the act of homicide (actus reus) is present, criminal responsibility is absent, but offence happened.

#### **Medico-Legal Importance**

1. Determines criminal liability - Protects mentally ill from wrongful prosecution
2. Court may order treatment in psychiatric institution instead of prison
3. Public Safety & Rehabilitation - Ensures mentally ill offenders are treated, not punished, balancing societal protection and individual rights

## 5. Filigree Burns & Medico-legal Importance

### Definition

Filigree burns are characteristic, superficial, fern-like or tree-branch patterned skin markings seen in victims of lightning strike. They are not true burns but are diagnostic of lightning injury. Also known as arborescent burns or Lichtenberg's flowers

### Mechanism of Production

Lightning causes a massive electrical discharge over the body surface. Sudden capillary rupture and vasodilatation occur due to Intense electrical energy and Thermal and electrostatic effects. This produces arborescent patterns following superficial blood vessels.

### Features

It is Fern-like / branching / tree-shaped (arborescent) pattern of reddish-brown or violaceous markings. It is usually seen on trunk, shoulders, and limbs. It is not burns. It does not show charring or tissue destruction.

### Cause and Mechanism of Death

Cardiac arrhythmia or Paralysis of respiratory center due to Lightning strike

### Post-Mortem Findings

External	Internal
<ul style="list-style-type: none"><li>• Presence of filigree burns</li><li>• Other injuries – Burns</li><li>• Singeing of hair</li><li>• Torn or burnt clothing</li></ul>	<ul style="list-style-type: none"><li>• Usually minimal or non-specific</li><li>• Congestion of organs</li><li>• Petechial hemorrhages</li></ul>

### Medico-Legal Importance

1. Diagnostic of lightning strike
2. Helps differentiate Lightning injury from electrocution or thermal burns
3. Establishes manner of death – accidental
4. Important in Insurance claims, Compensation cases, Natural calamity-related deaths

## 6. Positive Signs of Pregnancy

### Definition

Positive signs of pregnancy are definitive and conclusive signs that prove the presence of a living fetus in the uterus. These signs are diagnostic of pregnancy and cannot be mimicked by other conditions.

### Positive Signs of Pregnancy

Fetal Movements	Fetal parts	Fetal Heart Sounds
<ul style="list-style-type: none"><li>Movements are <b>palpated by the examiner</b></li><li>Can be detected after <b>16-18 weeks</b></li><li><b>Seen by fifth month.</b></li></ul>	<ul style="list-style-type: none"><li>Head &amp; limbs <b>can be felt after 24 weeks.</b></li><li>Objective evidence of a live fetus</li></ul>	<ul style="list-style-type: none"><li>Important and definite sign</li><li>Heard by: <b>Doppler: 10–12 weeks</b> <b>Stethoscope: 18–20 weeks</b></li><li>Fetal heart rate: <b>120–160 beats/min</b></li></ul>

### Visualization of Fetus on Imaging

Ultrasonography (USG)	X-ray
<ul style="list-style-type: none"><li>Gestational ring – 6-7<sup>th</sup> week</li><li>Fetal pole and cardiac activity – 10<sup>th</sup> week</li></ul>	<ul style="list-style-type: none"><li>Fetal bones visible after 15-16 weeks</li></ul>

### Medico-Legal Importance

1. Definitive proof of pregnancy
2. Important in cases of Rape, Abortion, Disputed pregnancy
3. Helps determine Gestational age & Viability of fetus
4. Essential for Consent for MTP & Legal proceedings involving maternity
5. Prevents false claims of pregnancy (pseudocyesis)

## 7. Legal Issues in Artificial Insemination

### Definition

Artificial insemination (AI) is a medical procedure in which semen is introduced into the female reproductive tract by artificial means, without sexual intercourse, to achieve pregnancy. It may be:

- AIH – Artificial Insemination by Husband
- AID – Artificial Insemination by Donor
- AIHD – pooled donor contains semen from husband and donor

### Legal Acts & Regulations Related to Artificial Insemination (India)

1. Assisted Reproductive Technology (Regulation) Act, 2021 - Most important Act governing AI and ART in India, regulates Artificial insemination, IVF, gamete donation.
2. Surrogacy Act, 2021 - Prohibits commercial surrogacy & Allows only altruistic surrogacy

### Legal Issues in Artificial Insemination

- 1. Legitimacy of the Child** - In AIH, Child is legitimate. In AID, If done with husband's consent, child is legitimate. Without consent, legitimacy may be questioned.
- 2. Consent** - Written informed consent of Husband and wife is needed. Lack of consent can lead to allegations of adultery.
- 3. Adultery** - AID does not constitute adultery if performed with mutual consent and without sexual intercourse.
- 4. Donor Anonymity and Rights** - Identity of donor must be kept confidential. Donor has no parental rights or responsibilities toward the child.
- 5. Inheritance and Succession** - Child born through AIH or consensual AID is entitled to Inheritance and succession rights
- 6. Medical Negligence** - Use of Wrong semen sample, Inadequate screening of donor, Improper procedure can attract civil and criminal liability.
- 7. Birth Registration** - Parents recorded are Husband and wife. Donor's name is never recorded.
- 8. Record Keeping** - Failure of maintenance of Consent forms, Donor screening records & Procedure details may lead to medico-legal complications.
- 9. Ethical violations of doctors** can lead to Disciplinary action & Suspension or cancellation of license.

## 8. Causes of Death in Hanging

### Definition

Hanging is a form of asphyxia in which death is caused by suspension of the body by a ligature which encircles the neck and constricting force being the weight of the body.

### Causes / Mechanisms of Death in Hanging

Mechanisms of Death in hanging is usually multifactorial.

- 1. Asphyxia** - Compression of Trachea, Larynx leads to airway obstruction, hypoxia, and loss of consciousness.
- 2. Venous Obstruction** - Compression of jugular veins causes cerebral venous congestion, raised intracranial pressure, and cerebral hypoxia.
- 3. Arterial Occlusion** - Compression of carotid arteries leads to cerebral ischemia and rapid loss of consciousness
- 4. Vagal Inhibition** - Pressure on carotid sinus causes reflex cardiac arrest. Sudden death occurs with minimal asphyxial signs.
- 5. Fracture–Dislocation of Cervical Spine** - Seen in judicial hanging. It results in transection of spinal cord and instant death.
- 6. Combination of Factors** - Asphyxia & venous obstruction is the most common mechanism of death. It is seen in typical suicidal hanging

### Medico-Legal Importance

1. Determination of Manner of Death - Hanging is most commonly suicidal.
2. It should be Differentiated from Strangulation to rule out homicide.
3. Mechanism of death is different in each type of Hanging
  - a) Complete hanging - Asphyxia & venous obstruction
  - b) partial hanging - venous obstruction
  - c) judicial hanging - Fracture–Dislocation of Cervical Spine
4. Insurance & Compensation Cases - Suicide exclusions in insurance policies.

## 9. Narco-analysis

### Definition

Narco-analysis is a forensic investigative technique in which a subject is administered a sedative drug to induce a hypnotic or semiconscious state, during which inhibitions are reduced and the subject may reveal information believed to be suppressed consciously.

### Mechanism of Action

Drugs used are Sodium pentothal / Sodium amytal / Scopolamine which act as central nervous system depressants. They depress higher cortical functions (judgment, self-control) while allowing speech. The subject enters a twilight stage between consciousness and sleep, where deliberate lying is presumed to be difficult.

### Procedure

Before the test	During the test
<ol style="list-style-type: none"><li>1. Informed consent of the subject</li><li>2. Medical fitness assessment by an anesthetist.</li><li>3. Drug administered intravenously in controlled doses.</li><li>4. Subject enters a hypnotic state.</li></ol>	<ol style="list-style-type: none"><li>1. Questions are asked by experts.</li><li>2. 3 types of Questions are asked<ol style="list-style-type: none"><li>a) <b>Neutral questions</b> - Establish baseline responses. e.g., name, age</li><li>b) <b>Control questions</b> - Mildly stressful but unrelated to crime</li><li>c) <b>Relevant questions</b> - Directly related to the offence under investigation</li></ol></li><li>3. Responses are audio-video recorded.</li></ol>

### Medico-Legal Importance

1. Used as an investigative aid, not evidence
2. Helps generate leads and clues in complex cases
3. Reliability is low and inconsistent - Answers may include fantasy, confabulation, or suggestibility-induced responses.
4. Not admissible as evidence in Indian courts
5. Supreme Court has declared that deception detection tests such as narco-analysis, polygraph tests and brain-mapping cannot be done without the consent of the individual. Use of such methods are illegal and against constitution. As per Article 20(3) of the Constitution 'No person accused of any offence shall be compelled to be a witness against himself'. (***Selvi vs State of Karnataka (2010)***)

## 10. Resuscitation Artefacts

### Definition

Resuscitation artefacts are postmortem injuries or marks on the body produced during attempts at resuscitation, such as cardiopulmonary resuscitation (CPR), mouth-to-mouth breathing, or intubation, which may mimic ante-mortem injuries.

### Types of Resuscitation Artefacts

#### 1. External Artefacts

Abrasions, bruises, or contusions on chest, sternum, or ribs due to chest compressions

Facial injuries (lips, gums, teeth) due to mouth-to-mouth ventilation

#### 2. Internal Artefacts

Rib fractures, Sternal fractures, Hemorrhage in chest wall or internal organs

### Mechanism of Production

- Chest compressions → blunt trauma to ribs, sternum, and thoracic muscles
- Mouth-to-mouth ventilation → pressure on lips, gums, and tongue
- Airway manipulation / Intubation → mucosal abrasions, laryngeal or tracheal injuries
- Mechanical devices (AED, mechanical CPR) → deep tissue bruising or rib fractures

### Histopathology

- Fresh hemorrhage at fracture sites
- No inflammatory reaction (indicates peri-mortem or post-mortem injury)

### Medico-Legal Importance

1. Differentiation from ante-mortem injuries
2. Misinterpretation leads to assumption of assault or abuse
3. Documentation of resuscitation - Confirms attempted life-saving measures
4. Important in pediatric and elderly deaths - Helps avoid wrongful allegations of maltreatment