

## ANSWER KEYS

(Correct Answers are marked in bold letters)

## SECTION-A

1. **When examining a crime scene for specific fibres or fluorescent powders, why is 365 nm (Longwave) typically preferred over 254 nm (Shortwave)?**
  - a. Shortwave UV is too weak to cause fluorescence.
  - b. Longwave UV is safer for the eyes and skin during prolonged searches.**
  - c. Shortwave UV only works on dark-coloured surfaces.
  - d. Longwave UV penetrates deep into the substrate to find hidden blood.
2. **Which Indian institution collaborated with the ICRC to establish a humanitarian forensics initiative?**
  - a. National Forensic Sciences University (NFSU)**
  - b. All India Institute of Medical Sciences (AIIMS)
  - c. Central Bureau of Investigation (CBI)
  - d. National Crime Records Bureau (NCRB)
3. **Which parameter in a gait pattern refers to the angle formed between the "line of progression" and the "long axis of the foot"?**
  - a. Step Width
  - b. Foot Angle (or Toe-out/Toe-in angle)**
  - c. Stride Length
  - d. Cadence
4. **Which ISO number is for the competence and quality assurance of forensic science laboratories (testing and calibration)?**
  - a. ISO/IEC 9001
  - b. ISO/IEC 14001
  - c. ISO/IEC 17025**
  - d. ISO/IEC 27001
5. **Which Indian state has the largest coastline?**
  - a. Kerala
  - b. Gujarat**
  - c. Andhra Pradesh
  - d. Maharashtra
6. **Choose the word that best completes the analogy:  
Ephemeral: Permanent: Transparent?**
  - a. Opaque**
  - b. Clear
  - c. Translucent
  - d. Bright
7. **Which of the following sentences contains an error?**
  - a. Neither of the boys is guilty.
  - b. Each of the players are ready.**
  - c. Everyone has submitted the form.
  - d. Much has been done already.

**A train 180 m long crosses a pole in 9 seconds. What is its speed?**

8. a. 60 km/h  
b. **72 km/h**  
c. 80 km/h  
d. 90 km/h
9. **The ratio of ages of A and B is 3:5. If A is 24 years old, what is B's age?**  
a. 36 years  
b. **40 years**  
c. 30 years  
d. 28 years
10. **Find the missing term: 7, 14, 28, 56,?**  
a. 84  
b. **112**  
c. 126  
d. 98
11. **Assertion: Photography of the scene of crime plays a very important role in crime scene investigation.**  
**Reason: What a human may not be able to see can be recorded by a camera.**  
a. Both Assertion and Reason are false  
b. **Both Assertion and Reason are true**  
c. Assertion is true but Reason is false  
d. Assertion is false but Reason is true
12. **The jury system in India was formally abolished after which landmark case exposed its weaknesses in impartiality and susceptibility to public/media influence?**  
a. **K.M. Nanavati v. State of Maharashtra**  
b. Kesavananda Bharati v. State of Kerala  
c. Indira Gandhi v. Raj Narain  
d. State of Uttar Pradesh v. Rajesh Talwar
13. **In a certain code, "ROAD" is written as "URDG". How is "PATH" written?**  
a. **SDWK**  
b. QBUJ  
c. RCUK  
d. TCVL
14. **Which global pioneer is known as the "Father of Criminalistics"?**  
a. **Hans Gross**  
b. Edmond Locard  
c. Alphonse Bertillon  
d. Francis Galton
15. **The acronym ISO, widely referenced in forensic laboratories and quality assurance systems, stands for:**  
a. International Security Organization  
b. International Standards Organization  
c. **International Organization for Standardization**  
d. International Scientific Observatory
16. **Which of the following is not a class characteristic of evidence?**  
a. Shoe size  
b. Fiber type  
c. **DNA profile**  
d. Caliber of firearm
17. **The chain of custody ensures:**  
a. **Evidence is admissible in court**

- b. Evidence is stored permanently
  - c. Evidence is photographed
  - d. All of the above
18. **Which fingerprint development technique is most effective on non-porous surfaces?**
- a. Ninhydrin
  - b. Cyanoacrylate fuming**
  - c. Silver nitrate
  - d. Iodine fuming
19. **Which microscope is most suitable for examining trace fibres?**
- a. Compound microscope**
  - b. Electron microscope
  - c. Stereo microscope
  - d. Phase contrast microscope
20. **If the probability of finding a specific fibre at a crime scene is 0.02, what is the probability of not finding it?**
- a. 1.00
  - b. 0.98**
  - c. 0.20
  - d. 98.98
21. **The Chi-square test statistic is calculated as:**
- a.  $\Sigma(\text{Observed} - \text{Expected})^2 / \text{Expected}$**
  - b.  $\Sigma(\text{Observed} - \text{Expected}) / \text{Expected}$
  - c.  $\Sigma(\text{Observed} \times \text{Expected})$
  - d.  $\Sigma(\text{Observed} + \text{Expected})$
22. **Measurement of uncertainty is crucial in forensic science because:**
- a. It quantifies reliability of results**
  - b. It eliminates errors
  - c. It replaces expert testimony
  - d. None of the above
23. **In criminal trials, the “CSI Effect” is most accurately described as:**
- a. The tendency of forensic experts to exaggerate scientific findings in court to secure convictions.
  - b. The influence of crime television shows on jurors’ expectations regarding the availability and conclusiveness of forensic evidence.**
  - c. The psychological trauma experienced by investigators after repeated exposure to violent crime scenes.
  - d. The procedural bias created when investigators rely exclusively on circumstantial evidence instead of forensic science.
24. **Arrange the changes that appear in a cadaver in sequential order.**
- a. Rigor, Marbling, Cooling, Mummification
  - b. Cooling, Rigor, Mummification, Marbling
  - c. Cooling, Rigor, Marbling, Mummification**
  - d. Rigor, Cooling, Marbling, Mummification
25. **Preservation of surface dust print of footprint cannot be done by the following:**
- a. Photography method
  - b. Tracing method
  - c. Electrostatic method
  - d. Casting method**
26. **Arrange the following steps of criminal investigation in a proper sequence:**
- I) Preservation of physical evidences**

- II) Photography and sketching**  
**III) Protection of scene of crime**  
**IV) Information related to crime**
- I, III, IV, II
  - III, IV, II, I
  - IV, III, II, I**
  - II, I, IV, III
27. **The Frye v. United States (1923) case introduced the “general acceptance” test. Which scientific method was being proposed?**
- Truth serum interview with scopolamine
  - Acoustic spectrographic voice analysis
  - Probability matrix for ridge identification
  - Systolic blood pressure deception test**
28. **Which forensic scientist pioneered fingerprint classification in India?**
- B.N. Mullick
  - Hem Chandra Bose**
  - Lalji Singh
  - P.C. Mahalanobis
29. **Which principle in forensic science asserts that while individuals may lie, the evidence and facts themselves remain truthful?**
- Locard’s Exchange Principle
  - Law of Individuality
  - Principle of Analysis
  - None of the above**
30. **Which landmark Indian case established admissibility of expert scientific evidence?**
- State of Maharashtra v. Damu**
  - Kesavananda Bharati v. State of Kerala
  - Maneka Gandhi v. Union of India
  - None of the above
31. **Which case is recognized as the first in the world to be solved using DNA fingerprinting evidence?**
- O.J. Simpson case (1995, USA)
  - Colin Pitchfork case (1987, UK)**
  - Green River Killer case (2001, USA)
  - Josef Mengele identification (1985, Brazil)
32. **Which of the following is a non-destructive forensic analysis technique?**
- Fourier Transform Infrared Spectroscopy (FTIR)**
  - Atomic Absorption Spectroscopy (AAS)
  - Gas Chromatography – Mass Spectrometry (GC\_MS)
  - Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES)
33. **Which of the following is a quality assurance measure in forensic laboratories?**
- Peer review of reports**
  - Destroying old evidence
  - Ignoring inconclusive results
  - Skipping calibration
34. **Which forensic discipline historically struggles most with Popperian falsifiability due to reliance on subjective interpretation?**
- Forensic DNA Profiling
  - Forensic Toxicology
  - Bitemark Analysis**

- d. None of the above
35. **Which of the following is considered pattern evidence?**
- Fingerprints**
  - Blood group
  - DNA
  - All of the above
36. **Which of the following is a class characteristic of firearms evidence?**
- Caliber**
  - Unique striation marks
  - Firing pin impression
  - Breech face marks
37. **The National Forensic Sciences University (NFSU) was formally established in India in which year?**
- 2015
  - 2020**
  - 2010
  - 2000
38. **Digital evidence must be authenticated using:**
- Encryption keys
  - Passwords
  - Hash values**
  - Firewalls
39. **Precision in forensic measurement refers to:**
- Closeness to true value
  - Repeatability of results**
  - Accuracy of instruments
  - Standardization
40. **The headquarters of the International Court of Justice is located at:**
- Paris
  - The Hague**
  - Geneva
  - New York
41. **In forensic handwriting analysis, the most common stroke pattern represents:**
- Mean
  - Mode**
  - Median
  - Range
42. **In forensic ballistics, the average velocity of bullets is calculated using:**
- Mode
  - Mean**
  - Median
  - Range
43. **In forensic DNA profiling, probability calculations are used to:**
- Determine allele frequency**
  - Determine Gene frequency
  - Determine DNA frequency
  - Determine STR frequency
44. **Which design feature is most commonly found on revolver cartridges to prevent them from slipping through the cylinder?**
- Extractor groove

- b. **Rimmed case head**
  - c. Tapered body
  - d. Rebated rim
45. **The null hypothesis in forensic hypothesis testing usually states:**
- a. Evidence is conclusive
  - b. **No significant difference exists**
  - c. Suspect is guilty
  - d. Witness is reliable
46. **Bharatiya Nyaya Sanhita (BNS), 2023 replaces which earlier legislation?**
- a. **Indian Penal Code, 1860**
  - b. Indian Evidence Act, 1872
  - c. Code of Criminal Procedure, 1973
  - d. Indian Contract Act, 1872
47. **Which area of the hand is considered the primary target for GSR collection because it is most likely to catch discharge gases?**
- a. The palm and the base of the wrist
  - b. The fingertips and under the fingernails
  - c. **The web area between the thumb and index finger**
  - d. The knuckles and outer edge of the pinkie finger
48. **Under which section of Indian law provision have been made that the Court can form an opinion by an expert upon a point of science**
- a. **Section 39 of BSA**
  - b. Section 47 of BSA
  - c. Section 329 of BNSS
  - d. Section 45 of BSA
49. **Within forensic anthropology, which limitation applies when determining cause versus manner of death?**
- a. **Cannot definitively establish physiological cause of death; only skeletal trauma**
  - b. Can always determine homicide manner from sharp force trauma
  - c. Can uniquely establish physiological cause when decomposition prevents toxicology
  - d. Uses isotopic bone analysis to determine cause of death
50. **Faraday bags used for mobile devices block RF signals by:**
- a. Altering wavelength of signals
  - b. Generating active jamming signals
  - c. **Creating conductive enclosure that cancels fields**
  - d. Absorbing RF waves into thermal energy

**SECTION-B**

51. **Rigor mortis develops because:**
- Muscle proteins denature thermally as the body cools
  - Lactic acid causes muscle fibres to swell and harden
  - ATP depletion locks actin and myosin filaments into a rigid actomyosin complex**
  - Calcium is actively pumped out of muscle cells after death
52. **Adipocere is formed in a body by the:**
- Bacterial fermentation of muscle glycogen to lactic acid and ethanol
  - Hydrolysis and hydrogenation of body fats to higher fatty acids which combine with calcium and ammonium ions to form insoluble soaps**
  - Crystallisation of urea and uric acid in subcutaneous tissue
  - Polymerisation of body proteins under heat and pressure
53. **Fracture of the hyoid bone and conjunctival petechiae are characteristic findings of:**
- Drowning in fresh water
  - Acute myocardial infarction
  - Cerebrovascular accident
  - Strangulation (manual or ligature)**
54. **A bloodstain on a horizontal surface measures 8 mm in width and 16 mm in length. The angle at which the drop struck the surface is:**
- 15°
  - 45°
  - 30°**
  - 60°
55. **Histological evidence of leucocyte infiltration, fibrin deposition and early epithelial proliferation at a wound margin establishes that the wound was inflicted:**
- Antemortem, with survival of at least several hours after the injury**
  - After death (post-mortem)
  - By a sharp instrument exclusively
  - By a chemical agent exclusively
56. **Compared with the female skull, the typical adult male skull characteristically shows:**
- Sharper supraorbital margins, gracile mastoid processes and a pointed mental protuberance
  - More prominent supraorbital ridges, robust mastoid processes and a square mandibular angle**
  - A rounded cranial vault, small mastoid processes and a V-shaped palate
  - Bossing of parietal bones, a smooth nuchal area and gracile zygomatic arches
57. **On a dental chart using the FDI two-digit system, tooth 36 refers to the:**
- Upper right first permanent molar
  - Lower left first permanent molar**
  - Lower right first deciduous molar
  - Upper left third permanent molar
58. **Prolonged boiling and harsh chemical maceration of skeletal remains can:**
- Prevent removal of soft tissue from cancellous bone
  - Increase mineral density artificially
  - Cause the bones to swell and deform plastically

- d. Damage surface morphology and degrade DNA, biasing subsequent histological and molecular analyses**
59. **Carrea's index in forensic odontology is used to estimate:**
- Age, from progressive dental attrition
  - Sex, from canine dimorphism
  - Bite force, from molar surface area
  - Stature, from the mesio-distal dimensions of the lower anterior teeth**
60. **FORDISC and similar discriminant-function programmes assess population ancestry from skeletal measurements as:**
- A binary biological category that can be assigned with near-100% certainty
  - An obsolete construct never reported in modern casework
  - A statistical, population-level estimate carrying defined posterior probabilities**
  - A determination achievable only through mtDNA haplogroup analysis
61. **Hair shafts of African (Negroid) ancestry typically exhibit:**
- Flattened (kidney-shaped) cross-section, dense and uneven pigment distribution, and prominent pigment clumping**
  - Round cross-section, even pigment distribution, and a continuous medulla occupying more than half the shaft
  - Oval cross-section with fine, evenly distributed pigment and a fragmented medulla
  - Flattened cross-section with no pigment and absent medulla
62. **Forensic facial reconstruction ("facial approximation") from an unknown skull is established to be:**
- An investigative aid intended to elicit recognition leads, not a method of positive identification**
  - A method of positive identification suitable for sole reliance in court
  - Equivalent in evidentiary weight to nuclear DNA profiling
  - A technique used solely to estimate stature
63. **In cranio-facial photographic superimposition, the principle that mismatched anatomical landmarks reliably exclude an individual but matched landmarks do not uniquely identify is an example of:**
- An individualising technique with absolute discriminating power
  - A technique that establishes both identity and exclusion with equal certainty
  - An exclusionary technique, informative for non-identity but not individualising for identity**
  - A purely qualitative technique with no statistical basis
64. **Under INTERPOL DVI guidelines, the three primary identifiers used to establish identity in mass disasters are:**
- Tattoos, scars and clothing
  - Fingerprints, dental (forensic odontology) records and DNA**
  - Photographs, jewellery and personal effects
  - Body weight, hair colour and eye colour
65. **The term "Earliest Oviposition Date" (EOD) is distinguished from "minimum time since death" because oviposition can occur:**
- Before death (e.g. in cases of myiasis associated with neglect) or some time after death (e.g. when access of flies is delayed), so EOD does not always equal PMI**
  - Only at the moment of death and never before or after
  - Only on bodies in cold storage
  - Only by Coleoptera and not by Diptera
66. **The principle of the diatom test for diagnosis of drowning is that diatoms in inhaled water:**
- Are normally present in living human bone marrow at low levels

- b. Are produced de novo by decomposing tissues
  - c. **Pass through alveolar capillaries into the systemic circulation only while the heart is still beating**
  - d. Are exchanged across intact alveolar membranes after death
67. **Under CITES, species listed in Appendix-I are those:**
- a. **Threatened with extinction; international commercial trade is generally prohibited and trade in exceptional cases requires both export and import permits**
  - b. Whose international trade is unregulated provided any documentation accompanies the shipment
  - c. Listed solely at the request of a single Party country to protect its domestic wildlife
  - d. Of no current conservation concern but monitored for future evaluation
68. **Distinguishing closely related strains of *Bacillus anthracis* in microbial forensics relies on:**
- a. Gram staining and colony morphology alone
  - b. **High-resolution genotyping such as whole-genome sequencing and SNP comparison**
  - c. Routine antibiotic susceptibility testing
  - d. Light microscopy of vegetative cells
69. **Under the Wild Life (Protection) Act, 1972 (India), species listed in Schedule I are accorded:**
- a. No legal protection — listing is for monitoring only
  - b. Protection only during the breeding season of each species
  - c. Protection only within national parks but not within wildlife sanctuaries
  - d. **The highest degree of statutory protection**
70. **Starting with one double-stranded target molecule and assuming 100% PCR efficiency, the theoretical maximum number of copies of the specific target produced after 30 cycles is approximately:**
- a.  $2^{30} \approx 1.07 \times 10^9$  (about a billion)
  - b. 60 (Two per cycle)
  - c.  $\approx 10^{30}$
  - d.  $4 \times 30 = 120$
71. **Chelex 100, used for forensic DNA extraction, functions by:**
- a. Cleaving DNA at specific palindromic sequences
  - b. **Chelating polyvalent metal ions (e.g.  $Mg^{2+}$ ) that would otherwise act as cofactors for DNases**
  - c. Precipitating proteins by salting-out at high ionic strength
  - d. Reverse-transcribing RNA into complementary DNA
72. **Differential extraction of a vaginal swab from a sexual-assault victim separates female epithelial-cell DNA from sperm-cell DNA on the basis of:**
- a. Differential migration of sperm and epithelial DNA in agarose gels
  - b. Differential affinity of sperm DNA for silica columns
  - c. Differential methylation status of sperm and epithelial DNA
  - d. **Differential resistance of sperm cell membranes (disulphide-cross-linked) to lysis under standard SDS-proteinase K conditions**
73. **In capillary electrophoresis used for STR fragment separation, DNA fragments separate principally on the basis of:**
- a. Net charge, with positively charged fragments migrating fastest
  - b. Hydrophobicity, with hydrophobic fragments retained longest
  - c. **Size (length), with smaller fragments migrating through the polymer-filled capillary more rapidly than larger fragments under an applied electric field**

- d. Affinity for an immobilised antibody
74. **An individual of blood group A has, on the surface of erythrocytes and in the plasma, respectively:**
- B antigen on red cells; anti-A antibodies in plasma
  - A and B antigens on red cells; no antibodies in plasma
  - No antigens on red cells; anti-A and anti-B antibodies in plasma
  - A antigen on red cells; anti-B antibodies in plasma**
75. **The Kastle–Meyer (phenolphthalein) presumptive test for blood relies on:**
- The peroxidase-like activity of haemoglobin**
  - Direct reaction between haemoglobin iron and phenolphthalein to form a red coloured complex
  - Precipitation of phenolphthalein by the proteins of plasma
  - Fluorescence emission from haem groups under UV illumination
76. **The Takayama and Teichmann tests confirm the presence of blood by:**
- Producing characteristic microscopic haem-derived crystals**
  - Producing a precipitin line on a gel diffusion plate
  - Generating a deep pink colour identical to the Kastle–Meyer reaction
  - Producing chemiluminescence visible in darkness
77. **The precipitin test in forensic serology is used to determine:**
- The ABO blood group of a stain
  - The age of a bloodstain
  - The species of origin of a bloodstain (e.g. human versus non-human)**
  - The Y-chromosome haplotype of the donor
78. **Following the 2017 expansion, the number of STR loci in the CODIS core loci panel used by the FBI for the United States National DNA Index System is:**
- 13
  - 16
  - 20**
  - 30
79. **Calculation of random match probability for an autosomal STR profile assumes Hardy–Weinberg and linkage equilibrium and uses:**
- Simple addition of allele frequencies across loci
  - The product rule, multiplying the genotype frequencies at each independent locus**
  - The arithmetic mean of homozygote frequencies only
  - The reciprocal of the database size
80. **Forensic mitochondrial DNA sequencing for individual comparison routinely targets the hypervariable regions HV1 and HV2 located within the:**
- Coding region of cytochrome b
  - Non-coding control region (D-loop) of the mitochondrial genome**
  - 16S ribosomal RNA gene
  - Nuclear pseudogene NUMT region
81. **At a single autosomal STR locus the alleged father is 14,16; the mother is 12,14; the child is 14,15. The obligate paternal allele in the child is allele 15. If the population frequency of allele 15 is 0.10, the paternity index (PI) at this locus is:**
- $PI = 0.10 / 0.5 = 0.2$
  - $PI = 1 / 0.10 = 10$
  - $PI = 0.5 / 0.10 = 5$**
  - PI cannot be calculated — paternity is excluded
- Cherry red coloration of hypostasis is seen in:**

82. a. Cyanide poisoning  
b. **CO poisoning**  
c. Organophosphate poisoning  
d. Arsenic poisoning
83. **Washerwoman's skin appears in:**  
a. Hanging  
b. **Drowning**  
c. Burns  
d. Electrocutation
84. **Abrasion with tail indicates:**  
a. Fall injury  
b. Weapon type  
c. Age of injury  
d. **Direction of force**
85. **Postmortem staining is absent in:**  
a. Asphyxia  
b. CO poisoning  
c. **Severe hemorrhage**  
d. Cyanide poisoning
86. **Somatoscopic identification primarily relies on:**  
a. Metric measurements  
b. Radiology  
c. DNA profiling  
d. **Visual observations**
87. **A 6-month-old blood stain is analyzed for blood grouping. Most suitable method:**  
a. Direct agglutination  
b. Precipitation  
c. **Absorption-elution**  
d. ELISA
88. **Widow's peak is an example of:**  
a. Environmental trait  
b. Polygenic trait  
c. **Dominant genetic trait**  
d. Recessive mutation
89. **Brachydactyly refers to:**  
a. Extra fingers  
b. **Short fingers**  
c. Fused fingers  
d. Long fingers
90. **Which immunoglobulin class mainly crosses the placenta in Rh incompatibility?**  
a. IgA  
b. IgE  
c. IgM  
d. **IgG**
91. **When soluble antigen reacts with antibody, this is:**  
a. **Precipitation**  
b. Hemolysis  
c. Agglutination  
d. Mutation

**Which part of hair is primarily evaluated while calculating medullary index?**

92. a. Cuticle only  
b. Cortex and shaft diameter  
**c. Medulla and shaft diameter**  
d. Root sheath only
93. **Hair in anagen phase shows:**  
a. Club-shaped root  
**b. Active growth**  
c. No pigment  
d. Detached root
94. **Which plant tissue is most useful in forensic wood identification?**  
a. Parenchyma  
**b. Xylem**  
c. Phloem  
d. Cambium
95. **Which plant material is MOST likely to produce a false-positive benzidine reaction?**  
a. Potato  
b. Onion  
c. Garlic  
**d. Horseradish**
96. **The presence of third instar blowfly larvae generally indicates:**  
a. Death occurred only few hours  
**b. Progression of decomposition over several days**  
c. Complete skeletonization  
d. Absence of decomposition
97. **Which statement best differentiates insect succession from insect development analysis?**  
a. Succession studies one species' growth stages only  
b. Development analysis ignores PMI estimation  
**c. Succession examines changing insect communities over time**  
d. Both are unrelated to forensic science
98. **CITES came into force in:**  
a. 1947  
b. 1962  
**c. 1975**  
d. 1992
99. **Which is a known PCR inhibitor found in stool samples?**  
a. Hemoglobin  
b. Urea  
**c. Bile salts**  
d. Bacteria
100. **Deviation from Hardy-Weinberg equilibrium may occur due to:**  
a. Random mating  
b. No mutation  
**c. Genetic drift**  
d. Large population
101. **Which inheritance pattern is observed for autosomal STR markers?**  
a. Strict maternal inheritance  
b. Strict paternal inheritance

- c. **Biparental Mendelian inheritance**  
d. Cytoplasmic inheritance only
102. **Low template DNA sample shows missing allele at one locus. This is due to:**  
a. Pull-up peaks  
b. **Allelic dropout**  
c. Dye artifact formation  
d. Peak height imbalance
103. **A peak appears in another dye channel at same size position. This artifact is:**  
a. Stutter  
b. **Pull-up peak**  
c. Noise  
d. Mutation
104. **Electropherogram shows larger loci missing but smaller loci present.**  
**Interpretation:**  
a. Contamination  
b. **Degraded DNA**  
c. Mutation  
d. PCR inhibition
105. **In PCR, primers are extended in which direction?**  
a. 3' → 5'  
b. Random orientation  
c. **5' → 3'**  
d. Bidirectionally without polarity
106. **In real-time PCR, the fluorescence signal is measured during:**  
a. Denaturation  
b. Annealing  
c. **Extension**  
d. Post PCR analysis
107. **What does a lower cycle threshold (Ct) value indicate in qPCR?**  
a. Low amount of targeted DNA  
b. **High amount of targeted DNA**  
c. High DNA degradation  
d. High quantity of inhibitors
108. **The salting out method involves the addition of high concentration of salt to:**  
a. Increase DNA solubility  
b. Lyse the cells  
c. Degrade RNA  
d. **Precipitate proteins and contaminants**
109. **Haptens are:**  
a. Complete antigens  
b. **Non-immunogenic unless attached to carrier**  
c. Antibodies  
d. Enzymes
110. **The smallest bone in the human body is:**  
a. Malleus  
b. **Stapes**  
c. Incus  
d. Hyoid
111. **Which bone is used to measure the "Cephalic Index"?**  
a. Pelvis

- b. **Skull**
  - c. Femur
  - d. Humours
112. **Gustafson's method is used for:**
- a. Stature estimation
  - b. **Age estimation from teeth**
  - c. Sex determination from pelvis
  - d. Race determination from skull
113. **The structural unit of compact bone is:**
- a. **Osteon (Haversian system)**
  - b. Lamellae
  - c. Trabeculae
  - d. Osteocyte
114. **The most reliable skeletal indicator for ancestry (race) estimation in forensic anthropology is:**
- a. Pelvis
  - b. Long bone length
  - c. Teeth
  - d. **Cranial morphometric**
115. **Which part of the hair supplies nutrient, blood and oxygen to the hair.**
- a. Hair root
  - b. Hair Bulb
  - c. **Dermal Papilla**
  - d. Follicles
116. **Which one of the following is not a stage of hair growth cycle.**
- a. Anagen
  - b. Catagen
  - c. **Medullagen**
  - d. Telogen
117. **The Plants in which embryos have two seed leaves are called,**
- a. Monocots
  - b. **Dicots**
  - c. Tricots
  - d. All of the above
118. **The phenomenon where the severity of a genetic disease increases with each successive generation is known as:**
- a. Incomplete penetrance
  - b. **Anticipation**
  - c. Variable expressivity
  - d. Genomic imprinting
119. **Which BLAST variant is used to search a protein query sequence against a protein database.**
- a. BLASTN
  - b. **BLASTP**
  - c. BLASTX
  - d. TBLASTN
120. **In the benzidine test for blood stains which color formation indicates positive reaction,**
- a. Deep Pink Color
  - b. **Deep Blue Color**

- c. Deep Red Color
- d. Deep Black Color

NEFSU DDC