

ANSWER KEYS

(Correct Answers are marked in Bold Letters)

SECTION-A

1. Which constitutional amendment reduced the voting age in India from 21 years to 18 years?
 - a. 42nd Amendment
 - b. 44th Amendment
 - c. 61st Amendment**
 - d. 73rd Amendment
2. The headquarters of the World Trade Organization (WTO) is situated in:
 - a. Brussels
 - b. Geneva**
 - c. Paris
 - d. New York
3. Which of the following gases is NOT categorized as a greenhouse gas?
 - a. Methane
 - b. Nitrogen**
 - c. Carbon dioxide
 - d. Nitrous oxide
4. If observed frequencies and expected frequencies are nearly identical, the Chi-square value will generally be:
 - a. Very high
 - b. Negative
 - c. Equal to one
 - d. Very low**
5. Choose the antonym of the word "Ephemeral":
 - a. Fleeting
 - b. Temporary
 - c. Transient
 - d. Eternal**
6. Which of the following correctly matches the typical magnifying powers of microscopes commonly used in forensic science?
 - a. Stereo microscope – up to 1000× magnification
 - b. Compound light microscope – up to 100× magnification
 - c. Comparison microscope – up to 400× magnification
 - d. Electron microscope – up to 1,000,000× magnification**
7. Which casting material is most suitable for recovering fine tool marks from a steel surface at a crime scene?
 - a. Plaster of Paris
 - b. Dental stone
 - c. Mikrosil / Silicone-based casting compound**
 - d. Alginate
8. In forensic analysis, systematic error produces:
 - a. Random fluctuations
 - b. Increased objectivity
 - c. Greater precision only
 - d. Consistent deviation from the true value**
9. McNaughten's Rule is primarily associated with:
 - a. Determination of criminal insanity and understanding of the nature of the act**

- b. Victim compensation mechanisms
 - c. Witness examination procedure
 - d. Police investigation methods
10. **Which search technique is generally considered most appropriate for a large outdoor crime scene with limited investigators?**
- a. Zone search
 - b. Spiral search
 - c. **Strip/Line search**
 - d. Wheel search
11. **The Scheimpflug principle used in forensic photography states that:**
- a. The lens must shift laterally to increase focal depth
 - b. Lens tilt should remain orthogonal to the subject
 - c. Hyperfocal distance determines tilt angle
 - d. **Lens plane, image plane, and subject plane intersect along a common line**
12. **In forensic photogrammetry, which intrinsic camera parameter is essential for extracting accurate three-dimensional measurements?**
- a. Camera XYZ coordinates
 - b. **Principal point and lens distortion coefficients**
 - c. Tripod pitch-roll-yaw angles
 - d. Focal plane distance to evidence marker
13. **The first practical application of fingerprinting in criminal identification in India is associated with:**
- a. Lord Curzon
 - b. **Sir William Herschel**
 - c. Lord Dalhousie
 - d. Lord Cornwallis
14. **Adipocere formation is seen in:**
- a. Dead body exposed to air
 - b. **Dead body buried in damp, clay soil**
 - c. Burial in dry hot air
 - d. All
15. **To accurately photograph bite marks using reflected short-wave ultraviolet radiation (254 nm), the camera lens must be manufactured from which specialized optical material?**
- a. Extra-low dispersion glass
 - b. **Quartz or fluorite**
 - c. Polycarbonate-coated optics
 - d. Barium crown glass
16. **Which of the following is NOT recognized as a metabolite of diazepam?**
- a. **Lorazepam**
 - b. Temazepam
 - c. Oxazepam
 - d. Desmethyldiazepam
17. **The classical confirmatory test for arsenic poisoning is known as:**
- a. Marquis test
 - b. Mandelin's test
 - c. **Marsh test**
 - d. Vitali's test
18. **Which of the following alkaloids belongs to the Isoquinoline group?**
- a. Morphine
 - b. Cocaine
 - c. **Papaverine**

- d. Reserpine
19. Which of the following compounds belongs to the class of polychlorinated hydrocarbons?
- Malathion
 - Parathion
 - Endrin**
 - Diazinon
20. Which among the following poisons is volatile in nature?
- Cyanide**
 - Methyl parathion
 - Brucine
 - All of the above
21. The Bharatiya Nyaya Sanhita primarily governs:
- Civil disputes
 - Administrative tribunals
 - Rules of evidence
 - Substantive criminal law**
22. "Who propounded the term 'White-Collar Crime'?"
- Cesare Lombroso
 - Edwin Sutherland**
 - Emile Durkheim
 - Karl Marx
23. For photographing tyre impressions at night, the best lighting technique is:
- Flash directly from above
 - Oblique lighting at low angle from multiple sides**
 - No light needed
 - UV light only
24. Within the scope of forensic anthropology and pathology, establishing the 'cause' of death is distinct from determining the 'manner' of death. Which of the following represents an accurate limitation regarding the scope of forensic anthropology in this context?
- Forensic anthropology generally cannot definitively establish the physiological cause of death; it only characterizes the skeletal trauma associated with the fatal event.**
 - Forensic anthropology can definitively determine a homicide manner of death based solely on the presence of a peri-mortem sharp force trauma lesion.
 - Forensic anthropology is uniquely qualified to establish the physiological cause of death when advanced decomposition prevents soft tissue toxicology.
 - Forensic anthropology's primary scope is to utilize the Law of Progressive Change to determine the cause of death via isotopic bone analysis.
25. Arrange the following cannabis preparations in ascending order of tetrahydrocannabinol (THC) concentration: Bhang, Ganja, Charas, Hashish oil.
- Bhang → Ganja → Charas → Hashish oil**
 - Ganja → Bhang → Charas → Hashish oil
 - Hashish oil → Charas → Bhang → Ganja
 - Ganja → Hashish oil → Charas → Bhang
26. Which factor is MOST important in determining the credibility of an expert witness in court?
- duration of experience in relevant field
 - Number of appearances in court
 - Scientific qualifications, expertise, and methodology adopted**
 - type of evidences collected by the experts
27. Choose the option nearest in meaning to the word 'Obfuscate':
- Clarify

- b. Illuminate
 - c. Confuse intentionally**
 - d. Simplify
28. **Free legal aid to ensure equal justice is provided under which Article of the Indian Constitution?**
- a. Article 21
 - b. Article 39A**
 - c. Article 32
 - d. Article 36
29. **Which of the following is considered transient evidence?**
- a. Fingerprints
 - b. Bloodstains
 - c. Oduor**
 - d. Footwear impressions
30. **In information technology and ergonomics, "HCI" refers to:**
- a. High Computer Internet
 - b. High Computer Interference
 - c. Hold Human Complex
 - d. Human Computer Interaction**
31. **Which of the following is NOT recognized as a fundamental principle of forensic science?**
- a. Principle of Exchange
 - b. Principle of Relativity**
 - c. Principle of Individuality
 - d. Principle of Probability
32. **Which element among the following possesses the highest electron affinity?**
- a. Nitrogen
 - b. Oxygen
 - c. Fluorine
 - d. Chlorine**
33. **The Implicit Association Test (IAT), developed by Greenwald et al. (1998), is primarily designed to assess:**
- a. Perception
 - b. Attention
 - c. Implicit prejudice and attitudes**
 - d. Intelligence quotient
34. **Which chromatographic technique is most suitable for separation of non-volatile compounds?**
- a. GCMS
 - b. Gas chromatography
 - c. GCHS
 - d. HPLC**
35. **If sales increase from 200 units to 260 units, calculate the percentage increase.**
- a. 20%
 - b. 25%
 - c. 30%**
 - d. 35%
36. **In forensic odontology, the term "Chiloscopy" refers to:**
- a. Study of palatal rugae patterns for identification
 - b. Analysis of bite marks on human skin
 - c. Examination of lip print patterns for personal identification**
 - d. Microscopic study of dental pulp tissues
37. **Which constitutional body among the following is incorrectly categorized as constitutional?**

- a. Election Commission of India
 - b. Union Public Service Commission
 - c. Finance Commission
 - d. NITI Aayog**
38. **The cerebellum is primarily associated with:**
- a. Hormonal regulation
 - b. Body temperature control
 - c. Coordination of voluntary movements**
 - d. Long-term memory storage
39. **Choose _____ the _____ correct _____ preposition:**
“He is addicted _____ gambling.”
- a. with
 - b. for
 - c. to**
 - d. on
40. **The null hypothesis (H₀) generally represents:**
- a. Maximum certainty
 - b. Presumption of guilt
 - c. Alternative explanation
 - d. No effect or no difference**
41. **A footwear impression discovered in soft soil should be photographed:**
- a. Close-up scaled photography
 - b. Long-range photography
 - c. Mid-range photography
 - d. All of the above**
42. **In a positively skewed forensic dataset, the most appropriate measure of central tendency is generally the:**
- a. Mean
 - b. Range
 - c. Median**
 - d. Variance
43. **Which statement regarding admissibility of forensic evidence is most accurate?**
- a. Forensic evidence is admissible only if collected under the Exchange Principle (Locard), regardless of chain of custody.
 - b. Reports of Senior Scientific Officers (SSO) in State Forensic Science Laboratories are automatically admissible under Section 293 CrPC and Section 329 BNSS.**
 - c. Admissibility of forensic evidence is governed by the Best Evidence Rule and requires proper chain of custody and expert testimony.
 - d. Digital evidence is admissible only if accompanied by oral testimony of the investigating officer, not under Section 65B of the Indian Evidence Act
44. **Which statement regarding expert opinion under the Bharatiya Sakshya Adhiniyam is correct?**
- a. Expert opinion is conclusive proof
 - b. Expert testimony is inadmissible
 - c. Expert opinion assists the court in technical matters**
 - d. Courts are legally bound by expert conclusions
45. **While Calvin Goddard is popularised as the 'father of modern ballistics,' the critical instrumentation, the comparison microscope adapted specifically for comparing bullets side-by-side, was primarily engineered by which of his colleagues at the Bureau of Forensic Ballistics?**
- a. Alexandre Lacassagne and Victor Balthazard

- b. **Charles Waite and Philip Gravelle**
 - c. Albert S. Osborn and John Wigmore
 - d. Paul Kirk and August Vollmer
46. **Dr. E.H. Hankin served as a renowned Chemical Examiner and Bacteriologist in the late 19th and early 20th century. In which Indian city was his laboratory located, famously known for its rigorous medico-legal analysis and foundational work on cholera bacteriophages?**
- a. **Agra**
 - b. Madras
 - c. Lahore
 - d. Bombay
47. **Grammar:Language::Formula: ?**
- a. Equations
 - b. Calculations
 - c. **Mathematics**
 - d. Numeral
48. **Which of the following best explains the role of the sympathetic nervous system?**
- a. Regulation of digestion during rest
 - b. Control of voluntary skeletal movements only
 - c. **Activation of the fight-or-flight response**
 - d. Long-term memory storage
49. **Under the Bharatiya Sakshya Adhiniyam (BSA), 2023, what is the evidentiary status of a video recording that is simultaneously stored on a server and broadcast live?**
- a. The server recording is primary; the broadcast is secondary
 - b. **Both are considered primary evidence**
 - c. Only the server recording is admissible
 - d. Both are secondary evidence requiring 65B certification
50. **Bandura's Social Learning Theory emphasizes the importance of which mechanism in the acquisition of behavior?**
- a. Genetic predisposition
 - b. **Observational learning and modeling**
 - c. Unconscious childhood conflicts
 - d. Direct reinforcement only

SECTION-B

51. **Cadaveric spasm differs mechanistically from ordinary rigor mortis in that it:**
- Is caused by post-mortem cooling that denatures muscle proteins
 - Develops only after putrefactive hydrogen sulphide diffuses through tissue
 - Is reversible by warming the body to 40 °C
 - Develops instantaneously at the moment of death without the usual period of primary flaccidity.**
52. **An antemortem injury, a perimortem injury and a postmortem artefact in soft tissue may be distinguished histologically because:**
- Only postmortem artefacts show extravasation of red cells
 - An antemortem wound shows leucocytic infiltration and fibrin; perimortem injury (within minutes of death) shows haemorrhage but no inflammation; postmortem artefact shows neither haemorrhage nor inflammation**
 - Only antemortem wounds appear bloodless because circulation has ceased
 - Only perimortem injuries are accompanied by oedema and pus formation
53. **An elliptical bloodstain has a width of 5 mm and length of 10 mm. The angle of impact is:**
- 60°
 - 30°**
 - 45°
 - 0°
54. **Demonstration of diatoms in the bone marrow of a body recovered from water is regarded as supportive of antemortem drowning only when:**
- Any diatom is recovered, regardless of species or numbers, since diatoms are absent from living bone marrow
 - Diatoms are demonstrated in lung tissue alone, irrespective of marrow findings
 - The body has been in water for over six months, by which time normal bacterial diatoms develop in marrow
 - The species and abundance of diatoms in the marrow correspond reasonably with those in a control sample of the suspected drowning medium**
55. **Defence wounds are differentiated from suicidal hesitation cuts by their:**
- Location only on the wrist or anterior neck, in parallel groups of progressively deeper cuts
 - Presence on the dorsal surfaces of feet only
 - Location (palmar surfaces of hands, ulnar borders of forearms, fingers); irregular depth and orientation, with no parallel grouping**
 - Restriction to areas accessible only to the deceased's dominant hand
56. **Histological estimation of adult age from cortical bone (e.g. Singh & Bhasin, Kerley) typically counts which four cortical elements per microscopic field?**
- Periosteal cells, endosteal cells, osteoclasts and osteocytes
 - Intact (secondary) osteons, osteon fragments, lamellar bone area and non-Haversian canals**
 - Trabecular spicules, marrow cavities, fat cells and erythroblasts
 - Type I collagen fibres, type II collagen fibres, glycosaminoglycans and hydroxyapatite crystals
57. **When stature is reconstructed from a long bone using regression formulae, dry-bone measurements are typically corrected to fresh-bone equivalents by:**
- Subtracting 5 cm to account for joint cartilage compression
 - Adding approximately 2 mm to allow for cartilage and shrinkage**
 - Multiplying by 1.05 (a 5% expansion factor for re-hydration)
 - Dividing by the cube root of the body mass
58. **In bite-mark comparison, "class characteristics" of dentition refer to features such as:**
- Arch shape, spacing of teeth, and overall dental dimensions**

- b. DNA profiles of saliva left in the bite
 - c. Carbon-isotope ratios within dental enamel
 - d. Bite-force measurements determined by jaw musculature
59. **After hot-water maceration of skeletal remains, a degreasing step (e.g. with dilute ammonia or commercial degreaser) is performed to:**
- a. Re-mineralise the bone surface for stronger handling
 - b. Remove residual lipid content from the medullary cavity**
 - c. Add fluorescence to enable UV photography
 - d. Prepare the bone for radiocarbon dating exclusively
60. **Under INTERPOL DVI guidelines, Phase II of a mass-disaster response refers specifically to:**
- a. Pre-disaster preparation, training and exercises
 - b. Disposal of unidentified remains by cremation
 - c. Press briefings and family liaison only
 - d. Post-mortem examination of recovered remains and collection of post-mortem (PM) data**
61. **Among long bones used for stature regression, the femur and tibia generally produce narrower 95% prediction intervals than the humerus or radius because:**
- a. Upper-limb bones are not measured in centimetres
 - b. Lower-limb long bones are weight-bearing and proportionally more closely correlated with overall living stature than upper-limb bones**
 - c. Lower-limb bones contain less marrow
 - d. Femur length cannot vary between populations
62. **The distinctive optical features of human scalp hair under transmitted light derive from the cortex, where:**
- a. The medulla occupies more than two-thirds of the shaft, characteristic of human hair
 - b. Pigment granules (melanosomes) of varying density and distribution lie within elongated cortical cells, the medulla is generally fragmentary or absent**
 - c. The cuticular scales are coronal and continuous, and the cortex is unpigmented
 - d. Pigment is uniformly absent and the cortex is replaced by air
63. **In forensic anthropology, stable-isotope analysis of bone collagen ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$) and tooth enamel ($\delta^{18}\text{O}$, $^{87}\text{Sr}/^{86}\text{Sr}$) is used to infer:**
- a. The exact date of death, calibrated against atmospheric ^{14}C levels
 - b. Geographic provenance and dietary history of an individual**
 - c. The individual's blood group and HLA type
 - d. Cause and manner of death
64. **Isomegalen and isomorphen diagrams in forensic entomology differ in that:**
- a. Isomegalen diagrams apply only to Coleoptera and isomorphen diagrams only to Diptera
 - b. Isomegalen diagrams are temperature-independent
 - c. Isomorphen diagrams measure adult flight distance over time
 - d. Isomegalen diagrams plot temperature against time taken to reach a given larval size (length, width or weight)**
65. **The exine of a pollen grain is composed largely of a chemically inert biopolymer that confers exceptional preservation potential — namely:**
- a. Cellulose only
 - b. Lignin
 - c. Sporopollenin**
 - d. Keratin
66. **Acid (concentrated nitric or sulphuric acid) digestion of bone marrow is a standard preparative step for the diatom test because:**
- a. Acid stains diatoms a characteristic blue colour
 - b. Acid increases the number of diatoms by enzymatic multiplication
 - c. Acid digests organic tissue and most cellular debris while leaving the silica frustules of diatoms intact**

- d. Acid converts cellular calcium to silica diatom-like crystals
67. **Under CITES, species listed in Appendix II differ from those in Appendix I in that they:**
- Are completely banned from international trade with no exceptions
 - Are not currently threatened with extinction but may become so unless trade is regulated**
 - Receive no international trade controls of any kind
 - Are listed only by individual countries for domestic protection
68. **Cross-dating in dendrochronology refers to:**
- Counting the rings on the cut surface of a single beam to estimate the tree's age in years
 - Comparing the chemical composition of two wood samples by mass spectrometry
 - Sequencing the DNA of the wood and matching it against a tree species database
 - Matching a sequence of relative tree-ring widths from an unknown wood sample with a master chronology built from many trees of known felling dates from the same region**
69. **In the 2001 Amerithrax investigation, distinguishing the *B. anthracis* spore powder used in the attacks from other Ames-strain isolates was achieved chiefly by detecting and characterising:**
- Specific genetic morphotypes of the Ames strain by single-nucleotide polymorphisms and whole-genome sequencing**
 - Antibiotic susceptibility profiles alone
 - Spore size distribution measured by scanning electron microscopy
 - Standard Gram-staining colour intensity
70. **Under the Wild Life (Protection) Act, 1972 (India) prior to the 2022 amendment, species accorded the highest level of protection were placed in:**
- Schedule V (vermin)
 - Schedule I and Part II of Schedule II**
 - Schedule VI only
 - Schedule III only
71. **TaqMan probes used in real-time PCR carry a 5'-reporter dye (e.g. FAM) and a 3'-quencher (e.g. TAMRA). Fluorescence is generated because:**
- The probe binds to the polymerase and emits fluorescence directly
 - The quencher dye degrades on heating, exposing the reporter
 - The reporter is activated by visible light independent of probe cleavage
 - Taq polymerase's cleaves the annealed probe, separating reporter from quencher**
72. **In real-time qPCR, the cycle threshold (Ct) value is inversely related to the starting copy number of template because:**
- Higher Ct directly indicates more starting template
 - More starting template requires fewer amplification cycles to cross the fluorescence threshold**
 - Ct is independent of starting template under any conditions
 - Ct increases linearly with starting template
73. **DNA extracted by the Chelex 100 procedure is suitable for PCR but is generally unsuitable for restriction-enzyme digestion or RFLP analysis because:**
- Chelex destroys all DNA-bound proteins required for digestion
 - Chelex chemically methylates all CpG sites, blocking restriction sites
 - Chelex causes irreversible cross-linking of DNA fragments
 - Chelex extraction yields predominantly single-stranded DNA**
74. **In a BLAST sequence-similarity search, the Expect value (E-value) attached to a database hit represents:**
- The percentage of identical residues between the query and the subject
 - The phylogenetic distance, in millions of years, between query and subject
 - The number of alignments with at least the observed score that would be expected to occur by chance in the searched database**
 - The number of base pairs in the longest aligned region

75. **Linkage equilibrium between two genetic loci, an assumption of the product rule used in forensic random match probability calculations, means that:**
- The two loci must be located on the same chromosome
 - Genotypes at the two loci occur independently in the population**
 - The two loci must always be inherited together as a haplotype
 - All alleles at both loci must occur at equal frequency
76. **The H antigen on red cells of group O individuals is best described as:**
- In group O, no glycosyltransferase is functional, so H remains unmodified**
 - An antigen unique to group O and absent from groups A, B and AB
 - An IgM antibody produced by group O individuals
 - A mitochondrial antigen unrelated to ABO
77. **The Takayama and Teichmann confirmatory tests for blood produce, respectively:**
- Colourless prismatic crystals in both cases
 - Identical haematin crystals in both cases
 - Calcium oxalate crystals in both cases
 - Pink-coloured crystals and brown-coloured crystals**
78. **Statherin and histatin are body-fluid-specific mRNA transcripts whose detection is increasingly used as a confirmatory marker of:**
- Menstrual blood
 - Vaginal secretions
 - Semen
 - Saliva**
79. **Distinguishing menstrual blood from blood shed by a wound, in cases of alleged sexual assault, can be achieved by detecting which class of mRNA transcripts that are characteristic of endometrial remodelling?**
- Beta-haemoglobin transcripts, found only in peripheral blood
 - Salivary amylase, found only in menstrual blood
 - Prostate-specific antigen, found in both
 - Matrix metalloproteinases (e.g. MMP-7, MMP-10)**
80. **A consequence of the patrilineal inheritance pattern of Y-STRs without recombination outside the pseudoautosomal regions is that:**
- All males in an unbroken paternal lineage share the same Y-STR haplotype (subject only to mutation)**
 - Y-STRs identify a male individual as uniquely as autosomal STRs
 - Y-STRs are inherited from both parents and recombine freely
 - Y-STR profiles change every generation by several repeats
81. **Heteroplasmy in mitochondrial DNA refers to:**
- The presence of multiple nuclear DNA copies in a single cell
 - The complete absence of mtDNA in mature red blood cells
 - The presence of more than one mtDNA sequence variant within a single individual**
 - The transcription of mtDNA into messenger RNA
82. **An alleged father is not excluded at three independent autosomal STR loci with single-locus paternity indices of 4, 5 and 10. Assuming linkage equilibrium and a prior probability of paternity of 0.5, the combined paternity index (CPI) and the probability of paternity (W) are:**
- CPI = 19; W ≈ 95%
 - CPI = $4 \times 5 \times 10 + 0.5 = 200.5$; W = 50%
 - CPI = $(4 + 5 + 10)/3 \approx 6.3$; W ≈ 86%
 - CPI = 200; W = $200/(200 + 1) \approx 99.5\%$**
83. **Forensic DNA Phenotyping using SNP panels is currently capable of providing useful predictions of:**
- Exact age of the individual to within ± 1 year

- b. **Bio-geographic ancestry and externally visible characteristics such as eye, hair and skin colour**
c. Cause and manner of death
d. Specific facial features sufficient for personal identification
84. **Name the scientist(s) who derived reconstruction formulae for stature from dry bones**
a. Telkka (1950)
b. Rollet (1888)
c. Karl Pearson (1899)
d. **Trotter and Gleser (1952)**
85. **Polydactyly in man is due to**
a. Autosomal recessive allele
b. **Autosomal dominant allele**
c. Sex linked recessive allele
d. Sex linked dominant allele
86. **Angora is a wool fibre obtained from**
a. Deer
b. Goat
c. Camel
d. **Rabbit**
87. **How many bones are there in human skull?**
a. **14**
b. 13
c. 12
d. 09
88. **Name the cell that receives antigen presented by MHC molecule.**
a. Nk cells
b. B-cells
c. **T-cells**
d. Macrophages
89. **Which post-mortem change is least reliable for estimating time since death in advanced decomposition?**
a. Rigor mortis
b. Algor mortis
c. **Adipocere formation**
d. Vitreous potassium levels
90. **Most reliable skull features for sex determination among the following is:**
a. Nasal aperture width
b. **Supraorbital ridge prominence**
c. Cranial suture closure
d. Foramen magnum position
91. **Assertion (A): Algor mortis is a reliable indicator of time since death in all environmental conditions.**
Reason (R): Body cooling follows Newton's law of cooling.
a. Both A and R true, R explains A
b. Both A and R true, R not explanation
c. **A false, R true**
d. Both false
92. **Assertion (A): Blowflies are the first to colonize a corpse.**
Reason (R): They are attracted to decomposition odors.
a. **Both A and R true, R explains A**
b. Both A and R true, R not explanation

- c. A false, R true
d. Both false
93. **(Match the following)**
- | | |
|---------------------------|------------------------------|
| List I | List II |
| a. Cranial suture closure | 1. Age estimation (adult) |
| b. Epiphyseal union | 2. Age estimation (subadult) |
| c. Pubic symphysis | 3. Adult age estimation |
| d. Tooth eruption | 4. Child age estimation |
- a. a-1, b-2, c-3, d-4
b. a-3, b-2, c-1, d-4
c. a-1, b-3, c-2, d-4
d. a-2, b-1, c-3, d-4
94. **Which of the following is most resistant to putrefaction?**
- a. Uterus
b. Brain tissue
c. Liver
d. Lungs
95. **Which mutation involves substitution of one base pair?**
- a. Frameshift mutation
b. Point mutation
c. Deletion
d. Inversion
96. **Which fracture is typically associated with hanging?**
- a. Mandibular fracture
b. Clavicle fracture
c. Sternum fracture
d. Hyoid bone fracture
97. **(Assertion–Reason)**
Assertion (A): RFLP requires high-quality DNA.
Reason (R): It involves restriction enzyme digestion of long DNA fragments.
- a. Both A and R true, R explains A
b. Both A and R true, R not explanation
c. A false, R true
d. Both false
98. **The neutron activation analysis in hair examination is primarily used for:**
- a. Determining age
b. Elemental composition
c. Protein analysis
d. DNA sequencing
99. **Which insect order is most significant in forensic entomology?**
- a. Diptera
b. Coleoptera
c. Hymenoptera
d. Lepidoptera
100. **Which of the following are correct regarding cranial sutures?**
1. They close completely by age 25
2. Closure sequence is uniform in all individuals
3. They are used for adult age estimation

- 4. They show variability**
- 1 and 2
 - 3 and 4**
 - 1, 3 and 4
 - 2 and 3
101. **Which factor most significantly reduces sensitivity of acid phosphatase test in aged semen stains?**
- DNA fragmentation
 - Presence of bacteria
 - Oxidation of haemoglobin
 - Enzyme degradation**
102. **The Takayama crystal test is preferred over Teichmann because:**
- It works better on old stains**
 - It is more specific
 - It detects DNA
 - It is species-specific
103. **Which factor most affects allele drop-out in low copy number (LCN) DNA?**
- High template concentration
 - PCR stochastic effects**
 - High annealing temperature
 - Stable amplification
104. **Which factor most influences DNA denaturation temperature?**
- Sequence length
 - GC content**
 - Protein binding
 - RNA contamination
105. **Which DNA repair mechanism corrects UV-induced thymine dimers?**
- Nucleotide excision repair**
 - Base excision repair
 - Mismatch repair
 - Recombination repair
106. **Which component is MOST stable in decomposed blood?**
- RBC membrane
 - Hemoglobin derivatives**
 - DNA
 - Plasma proteins
107. **Which condition results in false homozygosity?**
- Allelic drop-out
 - Allele drop-in**
 - Mutation
 - Contamination
108. **The θ (theta) correction accounts for:**
- Mutation rate
 - Population substructure**
 - DNA degradation
 - PCR inhibition
109. **Which test is MOST specific for human blood identification?**
- Kastle–Meyer
 - Benzidine
 - Luminol
 - Precipitin**

110. **Subpubic angle in females is typically:**
- 70°
 - 70–80°
 - >90°**
 - Exactly 60°
111. **The stochastic threshold in DNA analysis is used to:**
- Measure DNA degradation
 - Calculate mutation rate
 - Determine allele dropout risk**
 - Estimate allele frequency
112. **Which body fluid shows highest DNA degradation rate?**
- Blood
 - Saliva
 - Semen
 - Urine**
113. **The FST value measures:**
- Population differentiation**
 - Mutation rate
 - DNA degradation
 - PCR efficiency
114. **The dental formula for permanent human dentition is:**
- 2-1-2-3**
 - 2-1-3-2
 - 1-2-3-2
 - 2-2-1-3
115. **Widow's peak is categorized as:**
- Environmental trait
 - Genetic trait**
 - Acquired characteristic
 - Pathological condition
116. **Lewis antigens are:**
- Adsorbed onto RBC surface**
 - Produced in RBCs
 - DNA markers
 - Enzymatic products
117. **Mutation rate is highest in:**
- Coding DNA
 - Non-coding DNA
 - Mitochondrial DNA**
 - Ribosomal DNA
118. **Assertion (A): Pelvis is most reliable for sex determination. Reason (R): It shows adaptations for childbirth.**
- Both true, R explains A**
 - Both true, R not explanation
 - A true, R false
 - A false, R true
119. **A skeleton shows narrow pelvis and prominent brow ridges. What is the most probable sex?**
- Male**
 - Female
 - Indeterminate

- d. Juvenile
120. Which fiber property is measured using polarized light microscopy?
- a. **Birefringence**
 - b. Elasticity
 - c. Density
 - d. Refractive index

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