

# SSA - DNA Forensics - Examination

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1. A is B's sister. C is B's mother. D is C's father. E is D's mother. Then, how is A related to D?
  - A Grandfather
  - B Grandmother
  - C Daughter
  - D Granddaughter
  
2. A snail is at the bottom of a 20-foot well. Each day, it climbs up 3 feet, but at night, it slips back 2 feet. How many days will it take for the snail to reach the top of the well?
  - A 17 days
  - B 18 days
  - C 19 days
  - D 20 days
  
3. Identify the pattern for the following sequence and find the next number: 2, 3, 5, 8, 12, 17, 23, —.
  - A 45
  - B 25
  - C 32
  - D 30
  
4. Look at this series: 12, 11, 13, 12, 14, 13, ... What number should come next?
  - A 10
  - B 16
  - C 13
  - D 15

5. Which word is the odd one out?

- A Trivial
- B Unimportant
- C Important
- D Insignificant

6. Which word does NOT belong with the others?

- A Wing
- B Fin
- C Beak
- D Rudder

7. The new employee was very \_\_\_ and quickly learned the ropes.

- A Adept
- B Inept
- C Ambitious
- D Reluctant

8. Choose the word that is closest in meaning to the given word: Perspicacious

- A Astute
- B Oblivious
- C Enthusiastic
- D Reluctant

9. Identify the correct sentence:

- A The team are going to the championship.
- B The team is going to the championship.
- C The team been going to the championship.
- D The team goes to the championship.

10. Which of the following is absent in animal cell?

- A Nucleus
- B Plastid
- C Cytoplasm
- D Mitochondria

**11.** The daughter cells have the same number of chromosomes when a cell divides by?

- A** Mitosis
- B** Meiosis
- C** Direct Division
- D** None of the above

**12.** The suicidal bags of the cell are

- A** Ribosomes
- B** Lysosomes
- C** Phagosomes
- D** Dictyosomes

**13.** Which of the following are longest cells of human body?

- A** Epithelial cells
- B** Pancreatic cells
- C** Nerve cells
- D** Epidermal cells

**14.** A, P, R, X, S and Z are sitting in a row. S and Z are in the centre. A and P are at the ends. R is sitting to the left of A. Who is to the right of P ?

- A** A
- B** X
- C** S
- D** Z

**15.** Find the statement that must be true according to the given information. Vincent has a paper route. Each morning, he delivers 37 newspapers to customers in his neighborhood. It takes Vincent 50 minutes to deliver all the papers. If Vincent is sick or has other plans, his friend Thomas, who lives on the same street, will sometimes deliver the papers for him

- A** Vincent and Thomas live in the same neighborhood.
- B** It takes Thomas more than 50 minutes to deliver the papers.
- C** It is dark outside when Vincent begins his deliveries.
- D** Thomas would like to have his own paper route.

**16.** A fruit seller had some apples. He sells 40% apples and still has 420 apples. Originally, he had:

- A 588
- B 600
- C 622
- D 700

**17.** Find the correct spelling :

- A Foreine
- B Foreign
- C Fariegn
- D Forein

**18.** Which among the following is spelled wrong :

- A Manual
- B Nephew
- C Athletic
- D Amature

**19.** Warrior is related to sword, carpenter is related to saw, farmer is related to plough. In the same way, the author is related to

- A Book
- B Fame
- C Reader
- D Pen

**20.** Which vitamins deficiency is especially important to avoid during pregnancy to prevent neural tube defects?

- A Vitamin A
- B Vitamin C
- C Folic Acid (Vitamin B9)
- D Vitamin K

**21.** What is the central dogma of molecular biology?

- A Protein synthesis → DNA replication → RNA transcription
- B DNA replication → RNA transcription → Protein synthesis
- C RNA transcription → Protein synthesis → DNA replication
- D Protein breakdown → RNA degradation → DNA mutation

**22.** What is the function of restriction enzymes in genetic engineering?

- A To synthesize DNA.
- B To join DNA fragments.
- C To cut DNA at specific sequences.
- D To amplify DNA.

**23.** I \_\_\_\_\_ been hit by a car, but luckily I just managed to get out of the way.

- A could have
- B can have
- C must have
- D should have

**24.** If a person walks at 14 km/hr instead of 10 km/hr, he would have walked 20 km more. The actual distance travelled by him is:

- A 46 km
- B 50 km
- C 70 km
- D 80 km

**25.** Complete the sentence Despite his best efforts to conceal his anger

- A we could detect that he was very happy
- B he succeeded in camouflaging his emotions
- C he could succeed in doing it easily
- D people came to know that he was annoyed

**26.** An individual with blood group "O" typically has which antibodies in their plasma?

- A Anti A antibodies
- B Anti B antibodies
- C Both Anti A antibodies and Anti B antibodies
- D Neither Anti A antibodies nor Anti B antibodies

**27.** Blood of type 'A' will be agglutinated by:

- A Anti A Serum
- B Anti B Serum
- C Both Anti A Serum and Anti B Serum
- D Neither Anti A Serum nor Anti B Serum

**28.** Which body fluid is detected using the PSA or 'p 30' test ?

- A Urine
- B Saliva
- C Vaginal Secretion
- D Semen

**29.** Luminol is prepared by :

- A 2-aminophthalhydrazine + Calcium chloride
- B 2-aminophthalhydrazine + potassium chloride
- C 2-aminophthalhydrazine + Sodium acetate
- D 2-aminophthalhydrazine + Sodium carbonate

**30.** Sensitivity of Luminol to detect blood is :

- A 10
- B 100
- C 1000
- D 10000

**31.** Who developed the Acid Phosphatase Test?

- A Leon Lattes
- B Albert Osborn
- C Frank Lundquist
- D Karl Landsteiner

**32.** The Heme prosthetic group in Hemoglobin is made up of which ring structure?

- A** Protophyrin IX ring
- B** Heterocyclic ring
- C** Thiazole ring
- D** None of the above

**33.** What are the amount of DNA that may be extracted from the following? i)Plucked Hair , ii) One single Cell, iii)Bone iv)Blood

- A** i)6.6 pg , ii)1-750ng , iii)20000-40000 ng , iv) 3-10ng
- B** i)1-750 ng , ii) 20000 -40000ng , iii) 6.6 pg , iv) 3-10 ng
- C** i)1-750 ng , ii) 6.6 pg , iii) 3-10 ng , iv) 20000-40000ng
- D** i) 3-10 ng , ii) 1-750 ng , iii) 20000-40000ng

**34.** Which among the following are PCR inhibitors ?

- A** Hemoglobin
- B** Indigo dye
- C** Melanin
- D** All of the mentioned

**35.** Elongation of target region by the primers are done by using :

- A** deoxynucleotide triphosphate
- B** deoxynucleotide diphosphate
- C** MgCl<sub>2</sub>
- D** Water

**36.** What is the type of procedure used to isolate DNA from a mixed sample of sperm and epithelial cells ?

- A** Phenol Chloroform Extraction
- B** Differential Extraction
- C** Chelex Extraction
- D** Southern Blotting

**37.** AmpliTaq Gold DNA polymerase is activated at what temperature ?

- A 72 degree celsius
- B 60 degree celsius
- C 95 degree celsius
- D 4 degree celsius

**38.** How much quantity of template DNA is necessary for PCR based fragment analysis ?

- A 1-10 ng of genomic DNA
- B 10-100ng of genomic DNA
- C 100-1000ng of genomic DNA
- D 1000-10000ng of genomic DNA

**39.** Which type of capillary gel electrophoresis is commonly used for DNA sequencing ?

- A Capillary Zone gel electrophoresis (CZE)
- B Capillary isoelectric focusing (CIEF)
- C Capillary gel electrophoresis (CGE ) with a polymer matrix
- D Micellar electrokinetic chromatography

**40.** The Innocence Project , Founded in 1992 has used evidence to :

- A Develop new DNA Fingerprinting technique
- B Exonerate wrongfully convicted individuals
- C Convict more criminals using DNA analysis
- D Establish DNA databases for Forensic use

**41.** Which among the following STR's are within the protein coding region ?

- A vWA
- B TH01
- C Both vWA and TH01
- D None of thementioned



- 42.** Nucleotide positions of Hypervariable Region -I (HVR-I) and Hypervariable Region -II (HVR-II) :
- A 85-600 and 16023-16569
  - B 16023-16569 and 85-600
  - C 16024-16365 and 73-340
  - D 73-340 and 16024-16365
- 43.** Which of the following is NOT a measure of dispersion?
- A Range
  - B Medium
  - C Variance
  - D Standard Deviation
- 44.** Which of the Following is a requirement for a one way ANOVA ?
- A Dependent Variables are categorical
  - B Independent Variable are continuous
  - C Homogeneity of variances
  - D Unequal sample sizes
- 45.** ANOVA is used to compare
- A Two means
  - B Three or more means
  - C Variance of two populations
  - D Proportions of multiple groups
- 46.** Which of the following is the correct formula for Bayes Theorem ?
- A  $P(A/B) = P(A) * P(B)$
  - B  $P(A/B) = P(B/A) * P(A) / P(A)/P(B)$
  - C  $P(A/B) = P(A)/P(B)$
  - D  $P(A/B) = P(B)/P(A)$

**47.** Type -I error and Type - II error are also known as :

- A** False positive and False Negative
- B** False Negative and False Positive
- C** Null hypothesis and Alternate hypothesis
- D** None of the mentioned

**48.** What error occurs when 'a true null hypothesis is rejected'?

- A** Type - I error
- B** TYPe - II error
- C** Both A and B
- D** None of the mentioned

**49.** A comparison microscope is used for :

- A** Bullets
- B** Hair
- C** DNA
- D** Both Bullets and Hair

**50.** What is the maximum magnification power of a compound microscope ?

- A** 1500X
- B** 1000X
- C** 450X
- D** 10X

**51.** Light that is confined to a single plane of vibration is said to be:

- A** Ultra Violet light
- B** Infra Red light
- C** Plane polarised light
- D** Halogen light

**52.** What are the sources of DNA at a scene of crime ?

- A** Hair
- B** Seminal stains
- C** Blood stains
- D** All of the mentioned

**53.** What type of detection is typically used in genetic analyzers to identify DNA fragments ?

- A Radio active labeling
- B Colorimetric assays
- C Fluorescence detection
- D Chemiluminescence

**54.** In a Genetic Analyzer, what does a peak in the electropherogram represent ?

- A A specific DNA sequence
- B The relative amounts of specific DNA Fragment
- C The size of a specific DNA fragment
- D The purity of the DNA sample

**55.** What is the purpose of the 'amelogenin' marker in forensic DNA analysis ?

- A To determine the size of DNA fragment
- B To analyse Mitochondrial DNA
- C To identify specific STR alleles
- D To determine the sex of the DNA source

**56.** Which is not a area of use of Y - Chromosome testing ?

- A In cases of sexualt assault
- B In cases of Y- deletion
- C In cases of paternity testing
- D In cases of biological connection between two sisters

**57.** What does '21' signify in the STR Marker 'D21S11' ?

- A Chromosome number
- B Allele number
- C Loci Position
- D Number of repeats

**58.** What are the commonly used nucleotide repeats in STR ?

- A mononucleotide
- B dinucleotide
- C trinucleotide
- D tetranucleotide

**59.** Which is the repeating tetranucleotide marker in TH01?

- A** TCAT
- B** CATT
- C** TTCA
- D** GCCA

**60.** Under which section of BNSS deals with the admissibility of reports from a Scientific Expert ?

- A** 293 of BNSS
- B** 329 of BNSS
- C** 176 of BNSS
- D** 103 OF BNSS

**61.** Mitochondrial DNA is inherited :

- A** Biparentally ( from both the parents)
- B** Maternally ( from the mother only )
- C** Paternally ( from the father only )
- D** Through random assortment

**62.** Which Forum serves as a board of Quality assurance and validation in Forensic DNA analysis ?

- A** CODIS
- B** FBI
- C** SWGDAM
- D** All of the mentioned

**63.** Which of the following swquencing technology is known for its high throughput and massively parallel processing ?

- A** Sanger sequencing
- B** Next Generation Sequencing
- C** Real time PCR
- D** Capillary electrophoresis

**64.** Which method is commonly used in Forensic DNA analysis for individual identification ?

- A Single nucleotide polymorphism
- B Restriction Fragment Length Polymorphism
- C Short Tandem Repeats
- D Mitochondrial DNA Sequencing

**65.** Which method can be used to estimate the ethnic origin of a person ?

- A SNP
- B STR
- C RFLP
- D VNTR

**66.** Most commonly used approaches to utilize real time PCR homogenous detection are :

- A Taq Man
- B SYBR Green
- C Both Taq Man and SYBR Green
- D None of the Mentioned

**67.** A nucleosome core particle consists of:

- A DNA and H1 histone
- B DNA and H2A-H2B dimer
- C DNA and a histone octamer
- D DNA and a tetramer of H3 and H4

**68.** The primary role of DNA Polymerase 'γ' in eukaryotes is to:

- A Replicate nuclear DNA
- B Repair DNA damage in the nucleus
- C Replicate mitochondrial DNA
- D Participate in DNA recombination

**69.** The template strand of DNA during transcription is also known as:

- A sense strand
- B antisense strand
- C coding strand
- D complementary strand

**70.** What is the preferred method for collecting small, dried bloodstains from a non-porous surface?

- A Scraping the stain directly into a paper envelope.
- B Swabbing the stain with a moistened sterile swab.
- C Cutting out the portion of the surface containing the stain.
- D Applying a liquid absorbent material to the stain.

**71.** The first criminal case in which DNA fingerprinting was used for identification and conviction was:

- A People v. Castro (USA)
- B The Colin Pitchfork case (UK)
- C State of Florida v. Tommy Lee Andrews (USA)
- D The Buck Ruxton case (UK)

**72.** Which of the following amino acids has a sulfur atom in its side chain?

- A Cysteine
- B Valine
- C Alanine
- D Serine

**73.** Transfer RNA (tRNA) and 5S ribosomal RNA (rRNA) genes are transcribed by:

- A RNA Polymerase I
- B RNA Polymerase II
- C RNA Polymerase III
- D RNA Polymerase V

**74.** Dried blood evidence should be packed in a:

- A Paper bag
- B Tin can
- C Glass jar
- D Plastic bag

**75.** What is the purine present in RNA?

- A Guanine
- B Thymine
- C Uracil
- D Cytosine

**76.** Forensic Quality Services International ( FQS-I ) accredits Forensic Laboratories to :

- A ISO 17025
- B ISO 17021
- C ISO 16025
- D ISO 17000

**77.** Sec.3.5 of ISO 17025 define s the term :

- A Internal Audit
- B Proficiency Testing
- C External Audit
- D Calibration of Instrumentrs

**78.** What does 'RFU' stands for ?

- A Refractive Fluorescence Unit
- B Relative Fragment Unit
- C Restriction Fragment Unit
- D Relative Fluorescence Unit

**79.** STR, SNP, InDel Are various Forms of ?

- A Mutation
- B DNA Transcription
- C DNA Translation
- D None of the above

**80.** Genetic drift in a population increases,when the :

- A Size of the Population Increases
- B Size of the Population reduces
- C Genotypic variations are observed
- D Phenotypic variations are observed

**81.** who's contribution is natural selection to Evolutionary Theory ?

- A EDMOND LOCARD
- B KARL LANDSTINER
- C CHARLES DARWIN
- D FRANCIS DARWIN

**82.** The SEAWALL EFFECT is also known as ?

- A Random selection
- B Natural selection
- C Mutation
- D Genetic drift

**83.** WHAT IS HARDY-WEINBERG EQUATION?

- A  $P^2+2PQ+q^2 =1$
- B  $p^2+2pq+q^2 =1$
- C  $p^3+3pq+q^2 =1$
- D  $2P+PQ+2Q =1$

**84.** FOR A POPULATION TO BE AT HARDY-WEINBERG EQUILIBRIUM WHICH OF THE PARAMETER ARE NECESSARY?

- A NO NATURAL SELECTION
- B A HUGE BREEDING POPULATION
- C RANDOM MATING
- D All of the Mentioned

**85.** WHICH AMONG THE FOLLOWING TOOLS CAN BE USED FOR PHYLOGENETIC ANALYSIS?

- A MEGA
- B PhyML
- C RAxML
- D ALL OF THE MENTIONED



**86.** WHICH OF THE FOLLOWING METHOD IS USED TO INVESTIGATE POACHING CASES INVOLVING RHINO HORN AND CAN HELP IDENTIFY THE GEOGRAPHIC OF THE HORN?

- A MITOCHONDRIAL DNA ANALYSIS
- B MORPHOLOGICAL ANALYSIS
- C STABLE-ISOTOPE ANALYSIS
- D RADIO-CARBON DATING

**87.** THE WILDLIFE PROTECTION SOCIETY OF INDIA WAS FOUNDED IN?

- A 1994
- B 1972
- C 1984
- D 1980

**88.** WHICH SECTION UNDER THE WILDLIFE PROTECTION ACT, 1972 DEALS WITH PENALTIES?

- A SECTION 10 OF THE ACT
- B SECTION 45 OF THE ACT
- C SECTION 51 OF THE ACT
- D SECTION 52 OF THE ACT

**89.** Which among these is the latest amendment made under the WILDLIFE PROTECTION ACT, 1972?

- A Amendment of 2002
- B Amendment of 2010
- C Amendment of 2020
- D Amendment of 2022

**90.** When was IUCN established ?

- A 1950
- B 1964
- C 1968
- D 1972

**91.** CITES STANDS FOR?

- A CONSERVATION OF INTERNATIONAL TRADE OF ENDANGERED SPECIES
- B CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
- C CONVENTION OF INDIAN TRIBAL AND ENDANGERED SPECIES
- D NONE OF THE Mentioned

**92.** WHICH OF THESE ARE A FORM OF POACHING WILDLIFE?

- A SNARE & TRAP
- B ELECTROCUTION
- C SHOOTING BY GUN
- D ALL OF THE Mentioned

**93.** What is the Detector used in a Genetic Analyzer ?

- A Thermal Conductivity Detector ( TCD)
- B Flame Ionization Detector (FID)
- C Charged Couple Detector ( CCD)
- D Electron Capture Detector (ECD)

**94.** What is the function of Formamide in a Capillary Electrophoresis

- A Help to denature the double -stranded DNA molecule
- B Help to reduce the salt levels
- C Aid the electrokinetic injection process
- D All of the Mentioned

**95.** Under which section of BNS ,Murder is defined?

- A 300
- B 101
- C 302
- D 103

**96.** Under which section of BNS ,Rape is defined?

- A 62
- B 63
- C 64
- D 65

**97.** Section 64 of BNS is related to :

- A** Punishment of Rape
- B** Punishment for murder
- C** Stalking
- D** Dowry death

**98.** Age of blood stain can be determined by ,except :

- A** Colour change
- B** protein pattern
- C** Globulin /Albumin ratio
- D** DNA

**99.** Exciter filter is a part of the following microscope:

- A** SEM
- B** TEM
- C** Fluorescence Microscope
- D** Phase contrast Microscope

**100.** A quantity of 1 ng of human genomic DNA corresponds to approximately of ----- no. Of copies of each locus that are amplified.

- A** 303
- B** 150
- C** 10510
- D** 5000