OMR Based NFAT MOCK TEST

M.Sc. Forensic Science/Biotechnology/Toxicology

Physics

1. Any moving object on earth finally comes to rest due to which among the following?
   A. Gravity
   B. Friction
   C. Inertia
   D. Motion

2. Which among the following principle is used by Bats?
   A. RADAR (Radio Detective & Ranging)
   B. SONAR (Sound Navigation & Ranging)
   C. Law of reflection
   D. Law of diffraction

3. Kirchhoff's first law (junction rule) is based on the conservation of:
   A. Energy
   B. Charge
   C. Momentum
   D. Mass

4. Which among the following explains the radiation emitted by black bodies?
   A. Big-bang theory
   B. Quantum Theory
   C. Piezoelectric Effect
   D. None of the above

5. On which of the following the jet Engine works?
   A. Conservation of energy
   B. Conservation of Linear Momentum
   C. Conservation of Mass
   D. Conservation of Angular momentum

6. In a full-wave rectifier, if the input frequency is f, the output frequency is:
   A. f/2
   B. f
   C. 2f
   D. 4f

7. A piece of Ice was tied with a string to a water bucket's bottom, and the water bucket was filled with water with ice fully submerged in it. What would be the impact on the level of water when the ice melts away completely?
   A. The level of water will go up
   B. The level of water will go down
   C. The level of water will remain unchanged
   D. The level of water will first increase then come to the previous one

8. If the time taken in an echo is 5 seconds, which among the following will be the approximate distance of the object from source of sound? (Assume normal room temperature at 20°C)
   A. 1715 meters
   B. 1256 meters
   C. 857 meters
   D. 554 meters

9. A Zener diode is primarily used as a:
   A. Rectifier
   B. Amplifier
   C. Voltage regulator
   D. Oscillator

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12. What do we call the strain produced in a body when the deforming force produces a change in its shape without changing its volume?
A. Linear Strain
B. Volumetric Strain
C. Shearing strain
D. Thermal Strain

13. Which of the following is true about an ideal gas:
A. Cp + Cv = R
B. Cp / Cv = R
C. Cp – Cv = R
D. None of the above

14. What is the Meissner effect?
A. Perfect paramagnetism in superconductors
B. Perfect ferromagnetism in superconductors
C. Perfect diamagnetism in insulators
D. Perfect diamagnetism in superconductors

15. What is the process which causes the elimination of one or more electrons from the atomic shell known as?
A. Excitation
B. Ionisation
C. Diffusion
D. Refraction

16. Which type of semiconductor do we get when pure silicon is doped with a group-5 element?
    A. n-type semiconductor
    B. p-type semiconductor
    C. Intrinsic semiconductor
    D. None of the above

17. What is the SI unit of pressure?
    A. Newton
    B. Weber
    C. Henry
    D. Pascal

18. What was a key postulate of Bohr's model of the atom?
    A. Continuous spectrum
    B. Random electron motion
    C. Energy levels
    D. Nucleus stability

19. The electric field inside a uniformly charged spherical shell is:
    A. Zero
    B. Non-zero and uniform
    C. Non-zero and non-uniform
    D. Dependent on the radius

20. A potentiometer is preferred over a voltmeter for measuring EMF because:
    A. It is more portable
    B. It draws no current from the cell
    C. It has a higher resistance
    D. It is cheaper

21. What is the reason for formation of Mirage in desert?
    A. Refraction of light
    B. Reflection of light

C. Total internal reflection of light
D. Both Refraction and Total internal reflection of light

22. The momentum of a photon of wavelength λ is:
A. hλ
B. h/λ
C. λ/h
D. h/cλ

23. A body moving in a circular path with a constant speed has a:
A. Constant velocity
B. Constant acceleration
C. Constant kinetic energy
D. Constant displacement

24. In a Wheatstone bridge, the bridge is balanced when:
A. Potential difference between midpoints is maximum
B. No current flows through the galvanometer
C. All resistors are equal
D. Current is equal in all branches

25. The wavelength of light in a denser medium (refractive index n) compared to its wavelength in vacuum (λ0) is:
A. nλ0
B. λ0 / n
C. λ0
D. n + λ0

Chemistry

26. Which law governs the solubility of gases in liquids?
A. Henry's law
B. Raoult's law
C. Dalton's law
D. Boyle's law

27. Which theory explains the colour and magnetic properties of coordination compounds?
    A. VBT
    B. Crystal field theory
    C. Molecular orbital theory
    D. Band Theory

28. What is the unit of molality?
    A. mol/L
    B. mol/kg
    C. g/L
    D. kg/mol

29. Nernst equation is used to calculate:
    A. Cell potential at non-standard conditions
    B. Resistance
    C. Current
    D. Capacitance

30. What is the standard electrode potential of the hydrogen electrode?
    A. 0.00 V
    B. 1.00 V
    C. -0.76 V
    D. 0.34 V

31. Which of the following is a primary cell?
    A. Lead storage battery
    B. Fuel cell
    C. Dry cell
    D. Nickel-cadmium cell

32. Which is a bidentate ligand?
    A. NH_3
    B. $C_2O_4^{2-}$

C. CN^-
D. Cl^-

33. The rate of reaction is affected by:
A. Temperature
B. Concentration
C. Catalyst
D. All of these

34. The half-life of a first-order reaction is:
A. Proportional to initial concentration
B. Independent of initial concentration
C. Inversely proportional to initial concentration
D. Depends on pressure

35. Activation energy is the:
A. Minimum energy required for a reaction to occur
B. Maximum energy required for a reaction
C. Energy of the reactants
D. Energy of the products

36. Which element is not a transition metal?
A. Fe
B. Zn
C. Cr
D. Mn

37. Which of the following is used as an anaesthetic?
A. $CHCl_3$
B. CCl_4
C. CH_2Cl_2
D. CF_2Cl_2

38. Which of the following factors does NOT affect the conductivity of an electrolytic solution?
A. Concentration of electrolyte
B. Nature of the solvent
C. Temperature
D. Pressure

39. Oxidation state of Co in $[Co(NH_3)_6]^{3+}$ is:
A. +1
B. +2
C. +3
D. 0

40. Which compound is commonly known as wood spirit?
A. Ethanol
B. Methanol
C. Phenol
D. Glycerol

41. Ethers can be cleaved by:
A. Dilute H_2SO_4
B. Conc. HBr
C. NaOH
D. $KMnO_4$

42. Which reagent is used to distinguish between alcohols and phenols?
A. Fehling's solution
B. Iodoform test
C. Neutral $FeCl_3$
D. Lucas reagent

43. Which of the following has the highest boiling point?
A. Alcohol
B. Aldehyde

C. Ketone
D. Ether

44. What is the functional group of carboxylic acids?
A. –OH
B. –COOH
C. –CHO
D. –CO–

45. Which of the following compounds will give a positive iodoform test?
A. Propanone
B. Ethanal
C. Propanal
D. Benzaldehyde

46. The reduction of aldehydes leads to the formation of:
A. Alcohols
B. Ketones
C. Carboxylic acids
D. Esters

47. Which amine reacts with Hinsberg reagent to form a soluble product?
A. Primary amine
B. Secondary amine
C. Tertiary amine
D. Quaternary ammonium salt

48. Which of the following is a secondary amine?
A. NH_3
B. CH_3NH_2
C. $(CH_3)_2NH$
D. $(CH_3)_3N$

49. Which of the following amines is most basic?
A. NH_3
B. CH_3NH_2
C. $C_6H_5NH_2$
D. $(C_2H_5)_2NH$

50. Which of the following will undergo SN1 reaction most easily?
A. CH_3Cl
B. $(CH_3)_3CBr$
C. CH_3CH_2Br
D. CH_3CH_2Cl

Biology

51. Which of the following is an example of an organism that reproduces by budding?
A. Amoeba
B. Yeast
C. Planaria
D. Spirogyra

52. A condition where a single gene affects multiple phenotypic traits is called:
A. Codominance
B. Pleiotropy
C. Polygenic inheritance
D. Epistasis

53. The causative agent of AIDS is:
A. Salmonella typhi
B. HIV
C. Plasmodium vivax
D. Mycobacterium tuberculosis

54. Colostrum, the yellowish fluid secreted by mother during the initial days of lactation, is rich in which antibody?
    A. IgA
    B. IgG
    C. IgM
    D. IgE

55. Which of the following is a hallucinogenic drug?
    A. Morphine
    B. Heroin
    C. LSD
    D. Cocaine

56. Which hormone is responsible for the maintenance of the endometrium during pregnancy?
    A. Estrogen
    B. Progesterone
    C. LH
    D. FSH

57. A plant disease caused by fungi is:
    A. Citrus canker
    B. Rust of wheat
    C. Tobacco mosaic
    D. Red rot of sugarcane

58. What is the primary role of flocs in sewage treatment?
    A. To produce biogas
    B. To remove toxic chemicals
    C. To settle suspended solids and reduce BOD
    D. To kill pathogenic bacteria

59. The lagging strand during DNA replication is synthesized:
    A. Continuously
    B. In fragments (Okazaki fragments)
    C. From 3' to 5' end
    D. Without the need for RNA primer

60. Which of the following is a primary producer in an aquatic ecosystem?
    A. Zooplankton
    B. Phytoplankton
    C. Small fish
    D. Large fish

61. Decomposers are also known as:
    A. Consumers
    B. Heterotrophs
    C. Saprotrophs
    D. Producers

62. What percentage of the incident solar radiation is captured by plants for photosynthesis?
    A. 1–5%
    B. 2–10%
    C. 10–20%
    D. 20–50%

63. The enzyme that catalyzes the removal of nucleotide sequences from the ends of DNA molecules is:
    A. Endonuclease
    B. Exonuclease
    C. Ligase
    D. Reverse transcriptase

64. Eutrophication in lakes is caused by:
    A. Excess nitrates and phosphates
    B. Increase in dissolved oxygen

C. Decrease in algal growth
D. Acid rain

65. The depletion of the ozone layer is mainly due to:
A. Carbon dioxide
B. Methane
C. Chlorofluorocarbons (CFCs)
D. Sulfur dioxide

66. Filiform apparatus is characteristic of:
A. Antipodals
B. Synergids
C. Central cell
D. Egg cell

67. Approximately what percentage of the energy from one trophic level is transferred to the next trophic level in an ecosystem?
A. 1%
B. 10%
C. 50%
D. 90%

68. The outermost layer of the human ovum is called the:
A. Zona pellucida
B. Corona radiata
C. Vitelline membrane
D. Plasma membrane

69. The semiconservative nature of DNA replication was experimentally proven by:
A. Hershey and Chase
B. Watson and Crick
C. Meselson and Stahl
D. Frederick Griffith

70. The concept of 'hotspots' for biodiversity conservation was given by:
    A. E.O. Wilson
    B. Norman Myers
    C. Paul Ehrlich
    D. Rachel Carson

71. The enzyme DNA gyrase (topoisomerase) is involved in:
    A. Unwinding the DNA helix
    B. Relieving supercoiling in DNA during replication
    C. Joining DNA fragments
    D. Synthesizing RNA primer

72. The concept of "survival of the fittest" is central to the theory of:
    A. Mutation
    B. Genetic drift
    C. Natural selection
    D. Lamarckism

73. The process of removing introns from hnRNA is called:
    A. Translation
    B. Transcription
    C. Splicing
    D. Ligation

74. A human female with Turner's Syndrome has:
    A. 44 autosomes + XO
    B. 44 autosomes + XXY
    C. 45 autosomes + XX
    D. 45 autosomes + XY

75. The Montreal Protocol is associated with the control of emission of:
    A. Carbon dioxide
    B. Chlorofluorocarbons
    C. Methane
    D. Nitrogen oxides

76. What is the process of comparing the microscopic striations on a fired bullet to striations found on a test-fired bullet from a suspect weapon?
A. Ballistic trajectory analysis
B. Bore examination
C. Striation matching
D. Primer residue analysis

77. The earliest known use of forensic science principles dates back to:
A. Ancient Rome
B. Medieval Europe
C. Ancient China
D. 19th Century America

78. Who is considered the "Father of Forensic Toxicology"?
A. Alphonse Bertillon
B. Mathieu Orfila
C. Francis Galton
D. Edmond Locard

79. Which technique developed by Alphonse Bertillon involved a system of body measurements for identification?
A. Dactyloscopy
B. Anthropometry
C. Odontology
D. Serology

80. A "plastic" fingerprint is formed when:
A. Oils and sweat are transferred to a surface
B. Fingers are pressed into a soft material
C. A finger has blood on it
D. It is lifted with adhesive tape

81. The study of the unique friction ridge patterns found on fingers, palms, and soles is called:
A. Palynology
B. Dactyloscopy

C. Graphology
D. Anthropology

82. Which component of human blood lacks a nucleus and cannot be used for nuclear DNA analysis?
A. Lymphocytes
B. Erythrocytes
C. Leukocytes
D. Platelets

83. What does RFLP stand for?
A. Random Fragment Length Polymorphism
B. Restriction Fragment Length Polymorphism
C. Repetitive Fragment Locus Pattern
D. Recombinant Faction Length Profile

84. A standard sample of known origin used for comparison with unknown evidence is called a:
A. Questioned sample
B. Control sample
C. Reference sample
D. Blind sample

85. The determination of the post-mortem interval is often assisted by the study of:
A. Plants (Botany)
B. Insects (Entomology)
C. Soil (Geology)
D. Bacteria (Microbiology)

86. The bluish glow emitted after treatment with Luminol is called:
A. Fluorescence
B. Phosphorescence
C. Chemiluminescence
D. Bioluminescence

87. The outermost layer of a hair shaft, composed of overlapping scales, is called the:
A. Medulla
B. Cortex
C. Cuticle
D. Follicle

88. What is the standard number of STR loci used by the FBI for DNA profiling in CODIS?
A. 5
B. 9
C. 13
D. 20

89. The precipitin test is a confirmatory test for:
A. Semen
B. Saliva
C. Blood (human origin)
D. Urine

90. The chemical test that gives a pink colour in the presence of cocaine is:
A. Marquis test
B. Scott test
C. Dillie-Koppanyi test
D. Duquenois-Levine test

91. Which skeletal feature is most reliable for determining the sex of an adult human skeleton?
A. Skull
B. Pelvis
C. Femur
D. Ribs

92. Short Tandem Repeats (STRs) are used in DNA profiling because they are:
A. Very long sequences of DNA
B. Highly variable between individuals
C. Identical in all humans
D. Only found in criminals

93. What is the primary class of drugs associated with euphoria and pain relief, often derived from opium poppy?
A. Stimulants
B. Hallucinogens
C. Opiates/Opioids
D. Depressants

94. A person who analyzes voice recordings to identify a speaker is a:
A. Forensic audiologist
B. Forensic phonologist
C. Forensic voice analyst
D. Forensic linguist

95. When collecting soil evidence, samples should be taken from:
A. Only the immediate area around the body/item
B. The crime scene and several reference samples from surrounding areas
C. Only from the suspect's shoes
D. Only from under the victim's fingernails

96. Forensic botany is the study of:
A. Plant matter used in drug production
B. Plant evidence (pollen, fibers, wood, seeds) at crime scenes
C. Plant toxins
D. Plant growth patterns for determining time of death

97. Adipocere formation (grave wax) is associated with:
A. Early decomposition in warm, dry environments
B. Rapid mummification

C. Decomposition in moist, anaerobic environments
D. Extreme cold preservation

98. Digital forensics primarily deals with:
A. Analyzing fingerprints on electronic devices
B. Recovering and analyzing data from electronic devices
C. Investigating crimes committed using digital cameras
D. Analyzing digital images of crime scenes

99. The "caliber" of a bullet refers to its:
A. Length
B. Weight
C. Diameter
D. Material

100. The study of diatoms in forensic science can help determine if a body drowned in:
A. Saltwater
B. Freshwater
C. A specific body of water
D. Both A and B

Answer Key

1. B	26. A	51. B	76. C
2. B	27. B	52. B	77. C
3. B	28. B	53. B	78. B
4. B	29. A	54. A	79. B
5. B	30. A	55. C	80. B
6. C	31. C	56. B	81. B
7. A	32. B	57. B	82. B
8. C	33. D	58. C	83. B
9. C	34. B	59. B	84. C
10. B	35. A	60. B	85. B
11. C	36. B	61. C	86. C
12. C	37. A	62. B	87. C
13. C	38. C	63. B	88. C
14. D	39. C	64. A	89. C
15. B	40. B	65. C	90. B
16. A	41. B	66. B	91. B
17. D	42. C	67. B	92. B
18. C	43. A	68. B	93. C
19. A	44. B	69. C	94. A
20. B	45. A	70. B	95. B
21. D	46. A	71. B	96. B
22. B	47. A	72. C	97. C
23. C	48. C	73. C	98. B
24. B	49. D	74. A	99. C
25. B	50. B	75. B	100. D