

**COMBINED TECHNICAL SERVICES EXAMINATION
(NON-INTERVIEW POST)**

COMPUTER BASED TEST

DATE OF EXAM: 08.08.2025 AN

**PAPER – II – PHYSICS, CHEMISTRY, BIOLOGY,
COMPUTER SCIENCE AND FORENSIC SCIENCE**

(Code-575)

1. Crime scene photography involves
- (i) Indoor and outdoor photography
 - (ii) Micro and macro photography
 - (iii) Scaled and labeled photography
 - (iv) Normal lighting and oblique lighting
- (A) (i), (ii), (iii) are correct and (iv) is not correct
(B) (i), (ii), (iv) are correct and (iii) is not correct
☒ (C) (i), (ii), (iii) and (iv) are correct
(D) (ii), (iii) and (iv) are correct and (i) is not correct
(E) Answer not known
2. The ability to establish the exact whereabouts of an item of evidence and under whose control it was from its collection to the court of law and everywhere in between is known as maintaining the
- (A) Chain of command (B) Continuity of investigation
☒ (C) Chain of custody (D) Business records circle
(E) Answer not known
3. Class characteristics of an evidence material collected from the scene of crime.
- (A) Have little evidentiary value
(B) Are useful for including a suspect with a high degree of certainty
☒ (C) Are useful for excluding a suspect
(D) (A) and (C)
(E) Answer not known

4. Which of the following is best suited for collection, preservation and transportation of blood stained clothing?
- (A) Metal boxes (B) Sealable plastic bags
☒ (C) Paper bags (D) Druggist fold
(E) Answer not known
5. Which of the following are individual characteristics?
- (a) A new automobile tyre impression
(b) A fingerprint
(c) A spent bullet cartridge from a rifled weapon
(d) A mass produced synthetic fibre
☒ (A) (b) and (c) (B) (a) and (b)
(C) (c) and (d) (D) (a) and (c)
(E) Answer not known
6. Arrange the following in sequential order.
In an explosive train
1. Detonator
2. Igniter
3. Containment
4. Main charge
- (A) 1, 2, 3, 4 (B) 2, 3, 4, 1
(C) 2, 1, 3, 4 ☒ (D) 2, 1, 4, 3
(E) Answer not known

7. What is fire?
- (A) Rapid oxidation similar to rusting process
 - (B) Flame that produces heat, smoke and light
 - ☒ (C) Rapid oxidation process with evolution of light and heat
 - (D) Slow reduction process with evolution of heat
 - (E) Answer not known
8. Tri Nitro Toluene (TNT) is a
- (A) Low explosive
 - ☒ (B) High explosive
 - (C) Booster
 - (D) Detonator
 - (E) Answer not known
9. The most common evidence of an explosion is
- (i) Fragmentation effects
 - (ii) Blast pressure
 - (iii) Thermal effects
 - (iv) All of the above
- (A) (i)
 - ☒ (B) (iv)
 - (C) (ii)
 - (D) (iii)
 - (E) Answer not known
10. The decomposition of solid organic matter by heat is called
- (A) Oxidation
 - (B) Ignition
 - (C) Convection
 - ☒ (D) Pyrolysis
 - (E) Answer not known

11. Rifled slug is used in the cartridges of _____ type of firearm.
- (A) Rifled (B) Shotgun
(C) Stengun (D) INSAS rifle
(E) Answer not known
12. Integrated Ballistic Identification System
- (A) identifies the range of the projectile
(B) identifies the direction of the bullet
(C) identifies the firearm which fired
(D) compiles all ballistic data regarding flight of a bullet
(E) Answer not known
13. For recovery of serial marks marked by the manufacturer on a firearm, reagent used is
1. Vinella's solution
2. Fry's reagent
3. Hume-Rothery solution
4. Scott reagent
- (A) 1, 2, 3 correct (B) 2, 3, 4 correct
(C) 1, 3, 4 correct (D) 1, 2, 4 correct
(E) Answer not known
14. The quick firing of two bullets one after another is termed
- (A) Sabot (B) Explosive bullet
(C) Armour-piercing bullet (D) Tandem bullet
(E) Answer not known

15. For tool mark examination, what is used to cast indentations with appreciable depth on metal or other surfaces.
- (A) Plaster of Paris ☒ (B) Wood's metal
(C) Plastic solutions (D) Adhesive tape
(E) Answer not known
16. An acronym which provide suspects or investigative leads from computerized database for finger print is
- (A) AAFS (B) AFTE
(C) FPDB ☒ (D) AFIS
(E) Answer not known
17. To determine gait pattern - How many consecutive foot or footwear marks are essential?
- ☒ (A) Four (B) Two
(C) Ten (D) One
(E) Answer not known
18. Individualization of biological evidence from a crime scene is carried out in which of the following division?
- (A) Forensic toxicology (B) Forensic entomology
☒ (C) Forensic DNA division (D) Forensic serology
(E) Answer not known

19. In forensic science, the term identification refers to
- (a) Placement of an inanimate object into its proper class
 - (b) Individualization of an inanimate object
 - (c) Establishing the identity of a person
 - (A) (a) only
 - (B) (a) and (c) only
 - (C) (a) and (b) only
 - (D) (b) only
 - (E) Answer not known
20. Forensic Science is
- ☒ (A) Application of science to criminal justice system
 - (B) Application of physical sciences to the court of law
 - (C) Application of forest science to the court of law
 - (D) Study of crime scene
 - (E) Answer not known
21. According to cosmic panspermia theory proposed by Arrhenius, which of the following statements are true?
- (i) Life existed throughout the universe
 - (ii) Spores etc. could freely travel through the space from one planet to other
 - (iii) Life was through on the earth with falling meteorites
 - (iv) Protoplasm reached the earth in the form of sports or germ
 - (A) (i) only
 - (B) (i) and (iii) only
 - ☒ (C) (i) and (ii) only
 - (D) (ii) and (iii) only
 - (E) Answer not known

22. In the lepidopteran insects, the Type I pheromones are synthesized in a gland located between the
- ☒ (A) Eight and ninth abdominal segments of female moths
 - (B) Fifth and sixth abdominal segments of female moths
 - (C) Eight and ninth abdominal segments of male moths
 - (D) Fourth and fifth abdominal segments of female moths
 - (E) Answer not known
23. Juvenile hormone is released from
- (A) Prothoracic gland
 - ☒ (B) Corpora allata
 - (C) Corpus luteum
 - (D) Corpora cardiaca
 - (E) Answer not known
24. In organisms which have DNA along with RNA, they use the RNA in carrying the orders of DNA, these are called
- ☒ (A) Non-Genetic RNA
 - (B) tRNA
 - (C) Genetic RNA
 - (D) Non-Genetic-DNA
 - (E) Answer not known
25. The clover leaf model for yeast tRNA proposed by
- ☒ (A) R. Holley (1968)
 - (B) R. Holley (1978)
 - (C) De Robertis (1975)
 - (D) Edmons (1971)
 - (E) Answer not known

26. If a fresh victim is found midafternoon and the insect analysis indicates that the egg were laid on the body at around 8.00 a.m. that means the person has been dead since atleast
- (A) 12.00 noon (B) 10.00 a.m.
☒ (C) 8.00 a.m. (D) 6.00 a.m.
 (E) Answer not known
27. The commercially available software for forensic anthropologists
- (A) SCISPOT ☒ (B) FORDISC
 (C) LabLynx (D) STARLIMS
 (E) Answer not known
28. Match the common name of insects correctly with their binomial nomenclature :
- | | |
|-----------------------------|----------------------------|
| (a) Grasshopper | 1. Sesamia inferens |
| (b) Black hairy caterpillar | 2. Spodoptera exigua |
| (c) Pink stem bores | 3. Colemania sphenarioides |
| (d) Beet armyworm | 4. Estigmene lactinea |
- (a) (b) (c) (d)
- ☒ (A) 3 4 1 2
 (B) 2 4 1 3
 (C) 4 2 1 3
 (D) 1 4 3 2
 (E) Answer not known

29. Among the following disease which one is caused by the Tick *Borrelia burgdorferi*.
- (A) Ehrlichiosis
 - (B) Tick Paralysis
 - ☒ (C) Lyme Disease
 - (D) Rocky Mountain Spotted Fever
 - (E) Answer not known
30. A valuable homogeneous substance secreted by hypopharyngeal glands of young worker honeybees called
- (A) Honey
 - (B) ☒ Royal jelly
 - (C) Propolis
 - (D) Wax
 - (E) Answer not known

31. A marriage between a polydactylous man and normal woman and they reproduce three children, a polydactylous daughter, a polydactylous son and normal son (Generation II). If the polydactylous daughter marry a normal man, their children are?
- ☒ (A) 2 polydactylous and 2 normal
 - (B) 1 polydactylous and 3 normal
 - (C) 3 polydactylous and 1 normal
 - (D) 4 polydactylous
 - (E) Answer not known
32. Many plants and animals, besides having autosomes and sex-chromosomes possess a special category of chromosomes called
- (A) L.Chromosome
 - (B) E-Chromosome
 - ☒ (C) Supernumerary chromosomes
 - (D) Lampbrush chromosome
 - (E) Answer not known
33. The X-chromosomes in mammalian female, one of which is active and remains euchromatic, whereas the other is inactive and forms at interphase called
- ☒ (A) Barr body
 - (B) Microchromosomes
 - (C) Heterochromatin
 - (D) Facultative heterochromatin
 - (E) Answer not known

34. Cat cry syndrome due to loss of small part of
- (A) Chromosome - 1 (B) Chromosome - 3
☒ (C) Chromosome - 5 (D) Chromosome - 7
(E) Answer not known
35. A codon which undergoes an alteration to specify another amino acid
- ☒ (A) Missence codon (B) Triplet codon
(C) Stop codon (D) Anti codon
(E) Answer not known
36. Assertion [A] : The decrease in number of white blood cell is called leucopenia.
- Reason [R] : Its common cause are bacterial infection.
- (A) [A] is true, but [R] is false
(B) Both [A] and [R] are true and [R] is the correct explanation of [A]
(C) [A] is false, [R] is true
☒ (D) Both [A] and [R] are true, but [R] is not the correct explanation of [A] is correct
(E) Answer not known
37. The junction between the terminal of a motor neurone and a muscle fibre is called
- (A) Nerve impulses ☒ (B) Neuromuscular junction
(C) Node of Rahvier (D) Neuromuscular protein
(E) Answer not known

38. Which among the following is not grouped by Amniota?
- (A) Mammalia (B) Aves
(C) Reptilia ☒ (D) Amphibia
(E) Answer not known
39. Match correctly the species of the same phylum?
1. Scorpion, Spider, Flies
2. Obelia, Hydra, Sycon
3. Planaria, Fasciola, Taenia
4. Nereis, Leech, Snail
- (A) 1 and 2 are correct ☒ (B) 1 and 3 are correct
(C) 2 and 3 are correct (D) 2 and 4 are correct
(E) Answer not known
40. Contractile vacuole in a protozoa is responsible for which function?
- (A) Ingestion (B) Locomotion
(C) Digestion ☒ (D) Osmoregulation
(E) Answer not known
41. For effective radiation of waves from the antenna, if the frequency of the audio signal is 1000 hertz, the length of the antenna is
- ☒ (A) 300 kilometers (B) 100 kilometers
(C) 330 kilometers (D) 1000 kilometers
(E) Answer not known

42. The general voltage equation of a frequency modulated wave is
 $(W_c = \text{angular frequency of the carrier wave,}$
 $W_s = \text{angular frequency of audio signal,}$
 $m_f = \text{modulation index})$
- (A) $e = E_c \cos(W_c t + m_f \sin W_s t)$
- (B) $e = E_c \cos(W_c \theta + m_f \sin W_s t)$
- (C) $e = E_c \cos(W_c t - m_f \sin W_s t)$
- (D) $e = E_c \cos(W_s t + m_f \sin W_c t)$
- (E) Answer not known
43. The frequency range of alpha band in Electroencephalogram is
- (A) Below $3\frac{1}{2}$ Hz
- (B) From $3\frac{1}{2}$ Hz to above 8 Hz
- (C) From about 8 Hz to above 13 Hz
- (D) Above 13 Hz
- (E) Answer not known
44. An ideal op-amp, the characteristics has
- (A) Zero input resistance, infinite output resistance
- (B) Infinite input resistance, zero output resistance
- (C) Infinite open-loop gain, infinite output resistance
- (D) Zero open-loop gain, zero output resistance
- (E) Answer not known

45. In an integrated circuit, the feedback device is
- (A) Resistor (B) ☒ Capacitor
- (C) Inductor (D) Diode
- (E) Answer not known
46. Assertion [A] : D-MOSFET operate with positive or negative gate voltage.
- Reason [R] : D-MOSFET acts like a capacitor.
- (A) [A] is true, but [R] is false
- (B) ☒ Both [A] and [R] are true and [R] is the correct explanation of [A]
- (C) [A] is false, [R] is true
- (D) Both [A] and [R] are true, but [R] is not the correct explanation of [A]
- (E) Answer not known
47. In astable mode, 555 timer generates
- (A) Single pulse wave (B) Triangular wave
- (C) Sine wave (D) ☒ Continuous square wave
- (E) Answer not known

48. Match the following :

Boolean Expression	Simplified Output
(a) $(A + B)(A + C)$	1. A
(b) $A + AB$	2. $A + B$
(c) $A + \bar{A}B$	3. $A + BC$
(d) $A(\bar{A} + B)$	4. AB

	(a)	(b)	(c)	(d)
(A)	2	4	1	3
☒ (B)	3	1	2	4
(C)	4	2	3	1
(D)	1	3	4	2
(E)	Answer not known			

49. Which of the following statements are true about JFET?

- (i) JFET is a three terminal semiconductor device.
 - (ii) The input circuit of a JFET is always reverse biased
 - (iii) The three terminals of a JFET are : emitter, base, collector
- (A) (i) only (B) (i) and (iii) only
- ☒ (C) (i) and (ii) only (D) (ii) and (iii) only
- (E) Answer not known

50. Assertion [A] : In a JFET, the common source connection is the most widely used arrangement.

Reason [R] : The common source connection provides high input impedance, good voltage gain and a moderate output impedance.

- (A) [A] is true, but [R] is false
- ☒ (B) Both [A] and [R] are true and [R] is the correct explanation of [A] is true
- (C) [A] is false, but [R] is true
- (D) Both [A] and [R] are true, but [R] is not the correct explanation of [A] is true
- (E) Answer not known

51. Assertion [A] : In the study of k-map, min terms and max terms will be repeatedly used.

Reason [R] : Min terms are associated with sum of product form (SOP) and max terms are associated with product of sum form (POS)

- (A) [A] is false, but [R] is true
- ☒ (B) Both [A] and [R] are true and [R] is the correct explanation of [A] is true
- (C) [A] is true, but [R] is false
- (D) Both [A] and [R] are false
- (E) Answer not known

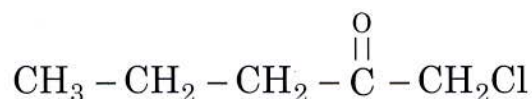
52. A flip flop which has only one input and which transfers the input data to the output on application of a clock pulse is called as
- (A) SR Flip-flop
 - (B) Clocked SR flip-flop
 - ☒ (C) D flip-flop
 - (D) JK flip-flop
 - (E) Answer not known
53. Assertion [A] : A transistor transfers a signal from a low resistance path to high resistance path.
- Reason [R] : A transistor has two pn junctions one junction is forward biased and the other is reverse biased.
- (A) [A] is true, but [R] is false
 - (B) Both [A] and [R] are false
 - ☒ (C) Both [A] and [R] are true and [R] is the correct explanation of [A] is true
 - (D) [A] is false, but [R] is true
 - (E) Answer not known
54. In a common base connection of a transistor, current amplification factor (α) is 0.9. If the emitter current is 1 mA. The value of base current will be
- ☒ (A) 0.1 mA
 - (B) 10 mA
 - (C) 100 mA
 - (D) 1000 mA
 - (E) Answer not known

55. Which of the following statements are incorrect with LCD?
- (i) It is very compact and light weight
 - (ii) It has no geometric distortion
 - (iii) It consumes less power
 - (iv) It cannot be easily interfaced with a 4-bit or 8-bit microprocessor
- (A) (i) only
(B) (ii) only
(C) (iii) only
☒ (D) (iv) only
(E) Answer not known
56. Which of the following statements are incorrect about the transistor?
- (i) A transistor can be used as an amplifier
 - (ii) Base of a transistor is heavily doped
 - (iii) For proper functioning of transistor as an amplifier, it is always in CB arrangement
 - (iv) A transistor can be used as an oscillator
- (A) (i) and (ii) only
☒ (B) (ii) and (iii) only
(C) (i) and (iii) only
(D) (ii) and (iv) only
(E) Answer not known

57. What value of series resistor is required to limit the current through a LED to 20 mA with a forward voltage drop of 1.6 V, when connected to a 10 V supply?
- (A) 120 Ω
 - (B) 220 Ω
 - (C) 320 Ω
 - ☒ (D) 420 Ω
 - (E) Answer not known
58. Which of the following statements are correct in accordance with diodes?
- (i) Forward power rating for germanium diode is 0.7 V
 - (ii) The ratio of reverse to forward resistance for germanium diode is 40000 : 1
 - (iii) The ratio of reverse to forward resistance for silicon diode is 1000000 : 1
 - (iv) Forward power rating for silicon diode is 0.3 V
- (A) (i) only
 - ☒ (B) (ii) and (iii) only
 - (C) (iv) only
 - (D) (i) and (iv) only
 - (E) Answer not known

59. The reverse current in a diode is of the order of
- (A) kA
 - (B) mA
 - ☒ (C) μ A
 - (D) A
 - (E) Answer not known
60. A semiconductor diode is used as
- (A) An amplifier
 - ☒ (B) A rectifier
 - (C) An oscillator
 - (D) A voltage regulator
 - (E) Answer not known
61. Select the incorrect statement from the following option
- (A) Racemic modification in an equimolar mixture of dextro and levorotatory isomers
 - (B) Meso compounds contain more than one chiral Carbon Centre
 - ☒ (C) Meso compounds are externally compensated
 - (D) Racemic mixture is designated as dl-pair
 - (E) Answer not known

62. Write the IUPAC name of the following compound



- (A) 5 - chloro - 4 - Pentanone
- ☒ (B) 1 - chloro 2 - Pentanone
- (C) 5 - chloro - 4 Butanone
- (D) 1 chloro - 2 butanone
- (E) Answer not known

63. The correct structure of an optically active form of an acid whose molecular formula $\text{C}_5\text{H}_{10}\text{O}_2$ is

- ☒ (A) $\text{CH}_3 - \text{CH}_2 - \text{CH}(\text{CH}_3) - \text{COOH}$
- (B) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{COOH}$
- (C) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOCH}_3$
- (D) $\begin{array}{c} \text{CH}_3 - \text{CH} - \text{COOCH}_3 \\ | \\ \text{CH}_3 \end{array}$
- (E) Answer not known

64. A nucleophile must necessarily have the following

- (A) An unpaired electron
- ☒ (B) A loan pair of electrons
- (C) An overall positive charge
- (D) An overall negative charge
- (E) Answer not known

65. Which one of the following is the correct order of leaving group reactivity?
- ☒ (A) $\text{H}_2\text{O} > \text{ROH} > \text{ACO}^- > \text{OH}^-$
 - (B) $\text{OH}^- > \text{ACO}^- > \text{ROH} > \text{H}_2\text{O}$
 - (C) $\text{H}_2\text{O} > \text{ACO}^- > \text{ROH} > \text{OH}^-$
 - (D) $\text{OH}^- > \text{ROH} > \text{ACO}^- > \text{H}_2\text{O}$
 - (E) Answer not known
66. Homolytic fission of C – C bond leads to the formation of
- (A) Carbocation
 - (B) Carbanion
 - (C) Divalent ion
 - ☒ (D) Free radical
 - (E) Answer not known
67. Three molecules of benzyne combine to give as
- (A) Naphthalene
 - (B) Benzene
 - ☒ (C) Triphenylene
 - (D) Anthracene
 - (E) Answer not known

68. The maximum number of 90° angles between bond pair-bond pair of electrons is indicated in
- (A) dsp^2 hybridisation
 - ☒ (B) $sp^3 d^2$ hybridisation
 - (C) $sp^3 d$ hybridisation
 - (D) dsp^3 hybridisation
 - (E) Answer not known
69. The ionic character of the covalent bond depends upon the following one
- ☒ (A) Electronegativity differences of the bonded atoms
 - (B) Electron affinity differences of the bonded atoms
 - (C) Heat of enthalphy of the Bonded atoms
 - (D) Lattice energy differences of the bonded atoms
 - (E) Answer not known
70. The lattice energies of KF, KCl, KBr and KI follow the order
- ☒ (A) $KF > KCl > KBr > KI$
 - (B) $KI > KBr > KCl > KF$
 - (C) $KF > KCl > KI > KBr$
 - (D) $KI > KBr > KF > KCl$
 - (E) Answer not known

71. The hybridisation of ICl molecule is

- ☒ (A) sp^3
- (B) sp^2
- (C) sp
- (D) sp^3d
- (E) Answer not known

72. Conjugate acid of NH_3 molecule

- (A) NH_2^-
- (B) H_2O
- ☒ (C) NH_4^+
- (D) NH_2OH
- (E) Answer not known

73. Assertion [A] : The oxidising power of halogen is $F_2 > Cl_2 > Br_2 > I_2$

Reason [R] : E° value decreases from $E^\circ_{f_2/2f^-}$ couple to $E^\circ_{I_2/2I^-}$ couple

- (A) [A] is true, but [R] is false
- ☒ (B) Both [A] and [R] are true and [R] is the correct explanation of [A]
- (C) [A] is false, [R] is true
- (D) Both [A] and [R] are true, but [R] is not the correct explanation of [A]
- (E) Answer not known

74. The quantitative determinations of acid or base strength can be calculate by using the following equation

☒ (A) $K = \frac{a_H + a_{B^-}}{a_{HB}}$

(B) $K = \frac{a_H + a_{OH^-}}{a_H + OH^-}$

(C) $K = \frac{a[H^+OH^-]}{a[H_2O]}$

(D) $D = \frac{a_{OH^-} a_{H^+}}{a_H a_B}$

(E) Answer not known

75. In the electro chemical series elements or ions are arranged in the decreasing order of the following one

(A) Standard oxidation potential

☒ (B) Standard reduction potential

(C) Standard redox potential

(D) Standard electrochemical potential

(E) Answer not known

76. In the reaction of BF_3 with NH_3 , which is the Lewis acid and which is the Lewis base?
- (A) NH_3 is Lewis acid and BF_3 is the Lewis base
 - ☒ (B) BF_3 is the Lewis acid and NH_3 is the Lewis base
 - (C) Both are Lewis acid
 - (D) Both are Lewis bases
 - (E) Answer not known
77. The internal motions of the reacting molecules are not considered in the following concept
- (A) Transition state theory
 - ☒ (B) Collision theory
 - (C) Arrhenius theory
 - (D) Energy of activation
 - (E) Answer not known
78. For a certain first order $t_{0.5}$ is 100 sec. How long will it take for the reaction to be completed 75%?
- (A) 100 sec
 - ☒ (B) 200 sec
 - (C) 300 sec
 - (D) 50 sec
 - (E) Answer not known
79. In third order reaction, the time taken for any fraction of the reaction to be completed is inversely proportional to the
- (A) Square of final concentration
 - (B) Square of $1\frac{1}{2}$ concentration
 - ☒ (C) Square of initial concentration
 - (D) Square of initial and final concentration
 - (E) Answer not known

80. If the concentration of reactant decreases from 1.0 M to 0.25 M in 20 minutes for a first order reaction, the value of K is
- (A) 0.6932 min^{-1} (B) 6.932 min^{-1}
(C) 0.06932 min^{-1} (D) 69.32 min^{-1}
(E) Answer not known
81. Which of the following is a type of malicious software that disguise itself as legitimate software or appear to be harmless but once installed it performs malicious action?
- (A) Spasm (B) Phishing
(C) Trojan Horse (D) Virus
(E) Answer not known
82. Which of the following is an operational influence affecting cloud computing performance?
- (A) Market demand
(B) Technological advancements
(C) Network Latency
(D) Legal regulations
(E) Answer not known

83. Check for the validity of the matching statements

- (i) Cloud stack – Used to alter the cloud according to user requirement
- (ii) Amazon S₃ – Simple storage service
- (iii) Cloud storage – Module of offline storage
- (iv) Sales force – Iaas
- ☒ (A) (i) and (ii) (B) (ii) and (iv)
- (C) (i) and (iv) (D) (ii) and (iii)
- (E) Answer not known

84. _____ is a code Injection technique that exploits a security vulnerability occurring in the database layer of an application.

- ☒ (A) SQL injection (B) MYSQLenum
- (C) Database scanner (D) Oracle clipper
- (E) Answer not known

85. _____ is a program that can infect legitimate programs by modifying them to include a possibly evolved copy of itself.

- (A) Malwares ☒ (B) Computer virus
- (C) Antikey logger (D) Spywares
- (E) Answer not known

86. The term _____ is used to refer to a group of compromised computers running Malwares under a common command and control infrastructure.
- ☒ (A) Botnet (B) Bottlenet
(C) Pharming (D) Phishing
(E) Answer not known
87. Which protocol is commonly used for Wireless Sensor Networks (WSN) in IoT applications?
- ~~(A)~~ (A) TCP/IP ☒ (B) Zigbee
(C) BAC Net (D) More than one of the above
(E) Answer not known
88. Which of the following is not a valid aggregate function in SQL?
- (A) avg (B) min
(C) max ☒ (D) total
(E) Answer not known
89. What is the primary goal of a Database system?
- (i) Retrieve information from the Database
(ii) Store new information in the Database
(iii) To build good applications with standard backends
(iv) To build client server applications
- ☒ (A) (i) and (ii) (B) (i), (ii), (iii) and (iv)
(C) (iv) (D) (iii) and (iv)
(E) Answer not known

90. What are the list type available in HTML?
- (A) Ordered, unordered (B) Bullet, numbering
(C) Numbering, Alphabets (D) Ordered, List
(E) Answer not known
91. Which option is used to create a table to contents automatically in a word processor?
- (A) Insert → Table
(B) References → Table of contents
(C) Format → Tab
(D) View → Draft
(E) Answer not known
92. What does the ACID property stand for in the context of database transactions?
- (A) Atomicity, Consistency, Isolation, Durability
(B) Atomicity, Concurrency, Integrity, Durability
(C) Accuracy, Consistency, Isolation, Durability
(D) Accuracy, Constant, Integration, Data
(E) Answer not known
93. What does normalization in a relational database help with?
- (A) Avoiding redundancy (B) Increasing performance
(C) Reducing query time (D) Reducing query
(E) Answer not known

94. Which tag is used to render an image on a webpage?
- ☒ (A) img (B) src
(C) image (D) picture
(E) Answer not known
95. Which device is used to connect different Networks together?
- (A) Switch (B) Hub
☒ (C) Router (D) Repeater
(E) Answer not known
96. Check for the validity of the statements:
1. Asynchronous Digital Subscriber Line (ADSL) was introduced by PSTN.
 2. Two major systems for mobile communication is GSM and CDMA.
 3. Sending and receiving message simultaneously is a half duplex channel.
 4. Number of mobile phone connection is overtaking fixed connections
- (A) 1, 2, 3, 4 are valid statements
(B) 1 and 2 are valid statements
(C) 2, 3 and 4 are valid statements
☒ (D) 1, 2 and 4 are valid statements
(E) Answer not known

97. In the given time t_1 the required data is available in Memory Data Register then the elapsed time ($t_1 - t_0$) is called as
- (A) Cycle time (B) Access time
(C) Write time (D) Fetch time
(E) Answer not known
98. The need for a head to move and impinge on a ribbon to print character is avoided while using _____ printer.
- (A) Laser printer (B) Inkjet printer
(C) Dot matrix printer (D) Chain printer
(E) Answer not known
99. To access the service of operating system, the service is provided by
- (A) System resources (B) Program call
(C) System call (D) Kernel of operating system
(E) Answer not known

100. Choose the right answers which are listed below :

- | | | | |
|----|----------------------------------|---|----------------------------------|
| 1. | Mainframe Computers | – | IBM 4381, CDC 6600 |
| 2. | Supercomputers produced by India | – | PARAM AIRAWAJ |
| 3. | MINI computers | – | Can support only single user |
| 4. | CDAC | – | Produces super computer in India |
- (A) 1 and 2 are correct (B) 1, 2, 3, 4 are correct
☒ (C) 1, 2 and 4 are correct (D) 2, 3, 4 are correct
(E) Answer not known

101. Informal resources to victimization usually involves :

- (A) Court trail
(B) Police and legal authorities
☒ (C) Family, friend and community support
(D) Sentencing and punishment
(E) Answer not known

102. Which of the following is an example of a protective factor?

- ☒ (A) Strong family support
(B) Peer pressure to commit crime
(C) Poverty
(D) Substance abuse
(E) Answer not known

103. The order for awarding compensation to a victim of crime is made under, which section of code of criminal procedure?

- ☒ (A) Section 357 (B) Section 375
(C) Section 315 (D) Section 351
(E) Answer not known

104. Assertion [A] : Victimization surveys are being used to estimate the gap between reported and unreported crimes.

Reasoning [R] : These surveys help direct and attention to the experiences of victims.

Codes :

- (A) [A] is correct, but [R] is wrong
☒ (B) Both [A] and [R] are correct
(C) [A] is wrong, but [R] is correct
(D) Both [A] and [R] are wrong
(E) Answer not known

105. Match the following :

List I

- (a) Victim precipitation theory
- (b) Learned helplessness
- (c) Just World Theory
- (d) Thaumia theory

List II

- 1. Suggests victims may play role in triggering the crime
- 2. Victims develop a sense of powerlessness due to repeated trauma
- 3. People blame victims to maintain belief in a fair world
- 4. Focuses on psychological and emotional impact after victimization

- | | (a) | (b) | (c) | (d) |
|---|------------------|-----|-----|-----|
| (A) | 4 | 3 | 2 | 1 |
| (B) | 2 | 1 | 3 | 4 |
| ☒ (C) | 1 | 2 | 3 | 4 |
| (D) | 3 | 4 | 1 | 2 |
| (E) | Answer not known | | | |

106. John Augustus practised probations for the first time in

- | | |
|---|---------------|
| (A) UK | (B) Austria |
| ☒ (C) USA | (D) Australia |
| (E) Answer not known | |

107. The reformatory theory of punishment primarily focuses on :
- (A) Public deterrence
 - (B) Compensation to victims
 - ☒ (C) Moral education and rehabilitation of the offender
 - (D) Physical punishment
 - (E) Answer not known
108. Who is competent to commute death penalty to life imprisonment?
- (A) Director General of Prisons
 - ☒ (B) Governor of State
 - (C) Chief Minister
 - (D) Prime Minister
 - (E) Answer not known
109. Parole helps in :
- (A) Punishing the offender more
 - (B) Increasing jail population
 - ☒ (C) Rehabilitating the offender into society
 - (D) Delaying trial
 - (E) Answer not known
110. Judicial sentencing happens after which stage?
- (A) Arrest
 - ☒ (C) Conviction
 - (E) Answer not known
 - (B) Charge sheet
 - (D) Appeal

111. Which international organization is primarily involved in combating environmental crimes?
- (A) WTO (B) IMF
(C) NATO ~~(D) INTERPOL~~
(E) Answer not known
112. Drug addiction is most commonly classified under which type of crime in criminology?
- (A) White collar crime (B) Blue collar crime
~~(C) Victimless crime~~ (D) Organized crime
(E) Answer not known
113. Which of the following is an example of cyber crime?
- (A) Arson ~~(B) Identity theft~~
(C) Racketeering (D) Fraud
(E) Answer not known
114. The term "Statutory rape" refers to
- (A) Rape committed by a stranger
(B) Rape committed by family member
(C) Sexual Assault
~~(D) Sexual activity with a minor below the age of consent regardless of consent~~
(E) Answer not known

115. Who coined the term “white collar crime”?

- ☒ (A) Edwin Sutherland (B) Robert Merton
(C) Emile Durkheim (D) Enrico Ferri
(E) Answer not known

116. The Uniform Crime Reporting (UCR) is associated with which country?

- ☒ (A) United States (B) United Kingdom
(C) Canada (D) Italy
(E) Answer not known

117. A person who fails to tame, id impulses sufficiently, becomes a criminal. This is according to

- (A) Edwin Sutherland ☒ (B) Sigmund Freud
(C) Nigel South (D) Gabriel Tarde
(E) Answer not known

118. Victims DNA is no longer available to retrieve from which part of insect?

- (A) Salivary gland ☒ (B) Crop
(C) Intestine (D) Blood
(E) Answer not known

119. The observation, that men react to social structure and values and institutions derived there from was given by

- (A) Edwin H. Sutherland (B) Park and Burgers
(C) Robert K. Merton ~~(D) Donald Taft~~
(E) Answer not known

120. Match the following :

List I

- (a) Albert Cohen
(b) Travis Hirschi
(c) A.M. Guerry
(d) Messner and Rosenfeld

List II

1. Institutional anomie theory
2. Environmental criminology
3. Control theory
4. Delinquent sub-culture

- | | (a) | (b) | (c) | (d) |
|----------------|------------------|-----|-----|-----|
| (A) | 4 | 3 | 2 | 1 |
| (B) | 1 | 3 | 2 | 4 |
| (C) | 2 | 3 | 4 | 1 |
| (D) | 3 | 4 | 2 | 1 |
| (E) | Answer not known | | | |

121. Choose the correctly matched pairs

- | Viral Disease | | Causative agent |
|----------------------------------|---|---|
| 1. RSV like illness | : | Respiratory Syncytial Virus (RSV) |
| 2. Respiratory Syncytial disease | : | Influenza A |
| 3. SARS | : | SARS coronavirus |
| 4. Influenza | : | Human parainfluenza virus I |
| (A) Only 4 | | (B) Only 2 |
| (C) 2 and 4 | | ☒ (D) 1 and 3 |
| (E) Answer not known | | |

122. Which of the following food borne bacterium grows in SPS (Sulfadiazine and Polymyxin Sulfate) agar medium?

- | | |
|---|--------------------------|
| ☒ (A) Clostridium botulinum | (B) Campylobacter jejuni |
| (C) Campylobacter coli | (D) Escherichia Coli |
| (E) Answer not known | |

123. _____ is used as the counter stain in Gram staining.

- | | |
|----------------------|---|
| (A) Crystal violet | ☒ (B) Saffranin |
| (C) Methylene blue | (D) Iodine |
| (E) Answer not known | |

124. Microorganisms that live in an extreme acidic environment are referred to as

- (A) Thermophiles (B) Alkalaphiles
☒ (C) Acidophiles (D) Barophiles
(E) Answer not known

125. Which of the following are incorrectly paired?

- | | Viral disease | Infected plant |
|-----|-------------------------|--|
| 1. | Tobacco rattle virus | Tobacco |
| 2. | Tungro virus | Cauliflower |
| 3. | Cauliflower mosaicvirus | Rice |
| 4. | Potato virus Y | Potato |
| (A) | 1 and 4 | ☒ (B) 2 and 3 |
| (C) | 1 and 2 | (D) Only 4 |
| (E) | Answer not known | |

126. Kary Mullis, the inventor of PCR, received the noble prize in which of the following years?

- (A) 1991 (B) 1999
☒ (C) 1993 (D) 1982
(E) Answer not known

127. Assertion [A] : RFLP is a hybridization based, codominant length polymorphism type markers.

Reason [R] : It allows one to distinguish homozygotes from heterozygotes.

- (A) [A] is true, but [R] is false
- ☒ (B) Both [A] and [R] are true and [R] is the correct explanation of [A]
- (C) [A] is false, [R] is true
- (D) Both [A] and [R] are true; but [R] is not the correct explanation of [A]
- (E) Answer not known

128. Recessive alleles often arise due to

- ☒ (A) DNA mutations
- (B) Increased gene expression
- (C) Dominant gene expression
- (D) Hyper chromosomal activity
- (E) Answer not known

129. Which of the following enzymes is used to join DNA fragments by forming phosphodiester bond?

- (A) Helicase
- ☒ (B) DNA ligase
- (C) Reverse transcriptase
- (D) Taq DNA polymerase
- (E) Answer not known

130. The usage of RNase free water is essential in northern blotting, analysis. This is required for which of the following reasons?

- (A) To prevent DNA degradation
- ☒ (B) To prevent RNA degradation
- (C) To improve gel conductivity
- (D) To reduce the blotting time
- (E) Answer not known

131. Which of the following codes for the amino acid methionine?

- (A) UUU
- (B) GUA
- (C) UAG
- ☒ (D) AUG
- (E) Answer not known

132. The tendency of genes located on the same chromosome to be inherited together is referred as

- (A) Recombination
- (B) Repulsion
- ☒ (C) Linkage
- (D) Crossing over
- (E) Answer not known

133. Choose the correctly paired matches from the following :

Antiviral drugs		Targeted virus
(1) Azidothymidine (AZT)	–	HIV
(2) Oseltamivir (Tamiflu)	–	HIV
(3) Ribavirin	–	Hepatitis-B
(4) Valacyclovir (Valtrex)	–	HIV

☒ (A) (1) and (3)

(B) (1) and (4)

(C) (2) and (3)

(D) (3) and (4)

(E) Answer not known

134. In which of the following structures, the callose fails to dissolve, due to cytoplasmic male sterility?

(A) Anther wall

☒ (B) Tetrad of microspores

(C) Megaspore mother cell

(D) Pollen tube

(E) Answer not known

135. Choose the correctly matched pairs from the following :

Antibacterial agent		Mode of action
(1) Penicillin	–	Inhibits cell wall synthesis
(2) Tetracyclin	–	Inhibits protein synthesis
(3) Rifampin	–	Inhibits RNA synthesis
(4) Bacitracin	–	Inhibits RNA synthesis

(A) Only (4)

(B) (2) and (4)

☒ (C) (1), (2) and (3)

(D) Only (1)

(E) Answer not known

136. Which of the following statements are true about the given plant pathogenic bacteria?

- (i) Agrobacterium tumefaciens is the causative agent and crown gall.
- (ii) Erwinia amylovora is the cause of fire blight of banana and crown gall in pears.
- (iii) Xylella fastidiosa is a xylem limited bacterium that causes wide range of diseases in economically important plants
- (A) (i) only (B) (i) and (ii) only
- ☒ (C) (i) and (iii) only (D) (iii) only
- (E) Answer not known

137. Cytoplasmic membrane surrounding the vacuole of a plant cell is called as

- (A) Chromoplast (B) Protoplast
(C) Leucoplast ~~(D) Tonoplast~~
(E) Answer not known

138. Which of the following is not a characteristic of Riccia Thallus?

- ☒ (A) The tuberculate rhizoids possess smooth lumen
- ☐ (B) The ventral portion of thallus has compact mass of parenchyma tissue lacking chlorophyll
- ☐ (C) The dorsal region of the thallus possess narrow vertical slits
- ☐ (D) The outer most cell in each of the vertical cells are achlorophyllous
- ☐ (E) Answer not known

139. Which of the following are the examples of spices obtained from flowers/flower buds?

- (A) ☒ Saffron, Capers, Cloves (B) Sage, Basil, Clove
 (C) Saffron, Capers, Star Anise (D) Cloves, Caraway, Anise
 (E) Answer not known

140. Choose the right matches

- | Resin type | Source of Resin |
|-----------------|---------------------------------|
| 1. Copal | – <u>Agathis australis</u> |
| 2. Canadabalsam | – <u>Tetraclinis articulata</u> |
| 3. Amber | – <u>Abies balsamea</u> |
| 4. Rosin | – <u>Pinus voxburghii</u> |
- (A) 2 and 4 are correct (B) 1 and 3 are correct
 (C) 2 and 3 are correct ☒ (D) 1 and 4 are correct
 (E) Answer not known

141. The number of theoretical plates (n) is calculated from retention time and peak width is

- (A) $n = 7.5 \left(\frac{t_R}{w_b} \right)^2$ ☒ (B) $n = 16 \left(\frac{t_R}{w_b} \right)^2$
 (C) $n = 16 \times t_R \times w_b$ (D) $n = 5.45 \times t_R \times w_n$
 (E) Answer not known

142. A xylene chromatogram was obtained and recorded. The recorder speed was 3.68 cm/min. The retention time for xylene was 54.0 cm. The uncorrected retention time is
- (A) 198.72 min ☒ (B) 14.7 min
(C) 0.681 min (D) 1.75 min
(E) Answer not known
143. Thermal conductivity and flame ionization detectors are
- ☒ (A) Non-destructive and destructive detectors
(B) Destructive and non-destructive detectors
(C) Both are destructive detectors
(D) Both are non-destructive detector
(E) Answer not known
144. Which among the following is used as spraying agent in paper chromatography for the separation of amino acids?
- (A) Con. H_2SO_4 (B) Con. HCl
(C) CuSO_4 solution ☒ (D) Ninhydrin solution
(E) Answer not known
145. The purpose of injector in gas chromatography is
- (A) To inject the sample
(B) To vaporize the sample
(C) To mix the sample with carrier gas
☒ (D) All of the above
(E) Answer not known

146. Which one of the following is liquid-liquid chromatography technique?
- (A) Column chromatography
 - (B) Ion-exchange chromatography
 - ☒ (C) Paper chromatography
 - (D) Adsorption chromatography
 - (E) Answer not known
147. A 0.01 M solution of a compound transmits 20% of the radiation in a container with path length equal to 1.5 cm. The molar extinction coefficient of the compound is
- (A) $56.598 \text{ m}^{-1}\text{cm}^{-1}$
 - (B) $26.598 \text{ m}^{-1}\text{cm}^{-1}$
 - (C) $36.598 \text{ m}^{-1}\text{cm}^{-1}$
 - ☒ (D) $46.598 \text{ m}^{-1}\text{cm}^{-1}$
 - (E) Answer not known
148. The splitting of NMR signals arises due to the following
- (A) Shielding effect
 - (B) Spin-spin decoupling
 - ☒ (C) Spin-spin coupling
 - (D) Deshielding effect
 - (E) Answer not known
149. The effect of the extra nuclear electrons on the strength of the applied magnetic field is called
- ☒ (A) Magnetic shielding
 - (B) Magnetic deshielding
 - (C) Peak splitting
 - (D) Coupling
 - (E) Answer not known

150. Which one of the following is the wavelength range corresponding to UV-visible region?
- (A) 100-200 nm (B) 16-300 nm
(C) 400-800 nm ☒ (D) 200-800 nm
(E) Answer not known
151. Mass spectroscopic studies can be done for the following kind of substances
- (A) Solid
(B) Solid and Liquid
(C) Gas
☒ (D) Solid, Liquid and Gas
(E) Answer not known
152. In semi-micro qualitative analysis the presence of Zirconium ion is confirmed by the addition of following reagent with corresponding precipitate
- (A) Dil.HCl + KI – Yellow precipitate
☒ (B) Saturated oxalic acid – White precipitate solution
(C) Potassium hexa cyano ferrate (II) solution - yellow precipitate
(D) Dil.HCl + KSCN – Blood Red Precipitate
(E) Answer not known

153. Magneson reagent is called as

- (A) 2-hydroxy quinoline
- (B) Ammonical Silver Nitrate
- ☒ (C) Dye -stuff of para-nitrobenzene-azo -Resorcinol
- (D) Dye-stuff of parahydroxy azobenzene
- (E) Answer not known

154. The number moles of Dimethyl glyoxime required in the complex formation to the detection of Ni^{2+} ion

- (A) 4
- (B) 3
- ☒ (C) 2
- (D) 1
- (E) Answer not known

155. In semimicro qualitative analysis, the presence of tungsten, heated with dil. HCl and addition SnCl_2 followed by conc. HCl. produced the following colour precipitate.

- (A) Red
- ☒ (B) Blue
- (C) Orange
- (D) Pink
- (E) Answer not known

156. The Magneson reagent is

- ☒ (A) P-Nitrobenzene Azo resorcinol
- (B) P-Nitro benzene
- (C) Azo benzene
- (D) Resorcinol
- (E) Answer not known

157. Weight of solid sample used in semi-micro qualitative analysis ranges between _____ g.

- (A) 0.1 to 1
(B) ~~0.01 to 0.1~~
(C) 0.001 to 0.01
(D) 0.0001 to 0.001
(E) Answer not known

158. Volume of 0.5 M KMnO_4 required to oxidize 20 ml of 0.1 M FeSO_4 solution is

- (A) 5 ml
(B) 6 ml
(C) 4 ml
(D) ~~8 ml~~
(E) Answer not known

159. Assertion [A] : A primary standard solution is prepared by direct measurement of the weight of the solute and the volume of the solution.

Reason [R] : Sodium hydroxide is a hygroscopic substance. So it can't be a primary standard.

- (A) [A] is true but [R] is false
(B) Both [A] and [R] are true [R] is the correct explanation of [A]
(C) [A] is false, [R] is true
(D) ~~Both [A] and [R] are true; but [R] is not the correct explanation of [A]~~
(E) Answer not known

160. Which one of the following indicator is suitable for the p^H range 3.1 to 4.4?

- (A) Phenolphthalein (B) Methyl red
(C) Thymol blue ~~(D) Methyl orange~~
(E) Answer not known

161. In NMR spectroscopy, the spin quantum number (I) with even mass number and even atomic number is

- (A) $\frac{1}{2}, \frac{3}{2}, \frac{5}{2}, \dots$ ~~(B) 0~~
(C) 1, 2, 3, (D) $\frac{1}{2}, 1, \frac{3}{2}, 2, \frac{5}{2}, \dots$
(E) Answer not known

162. In a non-linear molecule, C_6H_6 , the number of vibrational degrees of freedom is

- ~~(A) 30~~ (B) 31
(C) 18 (D) 19
(E) Answer not known

163. Which of the following statements are true?

- (i) In X-Ray diffraction, Rotating crystal method is used to determination of the size of the unit cell of a crystal.
- (ii) Debye-Scherrer method is used to determine the space lattice of the crystal structure.
- (iii) Laue Method is used to determine the crystal structure.

- (A) (i) only
- (B) (i) and (iii) only
- ☒ (C) (i) and (ii) only
- (D) (ii) and (iii) only
- (E) Answer not known

164. In a crystal, the lengths of unit cell are different, two axes are right angles and third is obliquely inclined. The crystal system is

- (A) Orthorhombic crystal
- ☒ (B) Monoclinic crystal
- (C) Triclinic crystal
- (D) Rhombohedral crystal
- (E) Answer not known

165. The resonance condition in NMR spectroscopy is given by

- (A) $h\gamma = \frac{g_N \mu_N}{B_0}$
- ☒ (B) $h\gamma = g_N \mu_N B_0$
- (C) $h\gamma = \frac{g_N B_0}{\mu_N}$
- (D) $h\gamma = \frac{\mu_N B_0}{g_N}$
- (E) Answer not known

166. The pumping mechanism in a Laser device used to achieve
- ☒ (A) population inversion
 - ☐ (B) intensity the input radiation
 - ☐ (C) intensity the output radiation
 - ☐ (D) amplify the input radiation
 - ☐ (E) Answer not known
167. Compare the monochromaticity of an ordinary light ($\Delta\theta \sim 10^{10} H_z$) and a laser light ($\Delta\theta \sim 100 H_z$) for a light of frequency $10^{14} H_z$.
- ☒ (A) For laser light 10^{-12} and ordinary light 10^{-4}
 - ☐ (B) For laser light 10^{-10} and ordinary light 10^{-2}
 - ☐ (C) For laser light 10^{-9} and ordinary light 10^{-3}
 - ☐ (D) For laser light 10^{-10} and ordinary light 10^{-10}
 - ☐ (E) Answer not known
168. The rotational constant (B) for $H^{12}C^{14}N$ is $147.82 m^{-1}$. Calculate the moment of Inertia of HCN molecule. (Given : $h = 6.625 \times 10^{-34} JS$ and $C = 3 \times 10^8 m/s$)
- ☐ (A) $18.94 \times 10^{-46} kg.m^2$
 - ☒ (C) $1.894 \times 10^{-46} kg.m^2$
 - ☐ (E) Answer not known
 - ☐ (B) $189.4 \times 10^{-46} kg.m^2$
 - ☐ (D) $1894 \times 10^{-46} kg.m^2$

169. In the normal longitudinal Zeeman effect the spectral line of sodium splits into two components, which are _____
- (A) plane polarised ~~(B)~~ circularly polarised
(C) elliptically polarised (D) cylindrically polarised
(E) Answer not known
170. The usual life time of an atom in the excited state is
- (A) $\sim 10^{-6}$ sec (B) $\sim 10^{-3}$ sec
~~(C)~~ $\sim 10^{-8}$ sec (D) $\sim 10^{-10}$ sec
(E) Answer not known
171. In the Fraunhofer diffraction, the incident wavefront is
- (A) spherical ~~(B)~~ plane
(C) cylindrical (D) elliptical
(E) Answer not known
172. Which of the following conditions are correct to achieve the interference pattern two point sources should satisfy the following conditions?
- (i) The waves must be of similar types.
(ii) Wave sources must be coherent.
(iii) The waves must have comparable amplitudes.
- (A) (i) only (B) (i) and (ii)
(C) (ii) only ~~(D)~~ (i), (ii) and (iii)
(E) Answer not known

173. Which of the following statement is/are correct. Fresnel's biprism set-up can be used to?

- (i) Determine the wavelength of light.
- (ii) Determine the intensity of light.
- (iii) Determine the thickness of the thin sheet of transparent material.

- (A) (i) only
- (B) (ii) only
- (C) (iii) only
- ☒ (D) (i), (ii) and (iii) all
- (E) Answer not known

174. Which of the following examples are correct for the impulsive force?

- (i) a ball is falling in free space
- (ii) the blow of a hammer on a pile
- (iii) the force exerted by the bat on a cricket ball

- (A) (i) and (ii) only
- (B) (i) and (iii) only
- (C) (i) only
- ☒ (D) (ii) and (iii) only
- (E) Answer not known

175. In a rigid body, u and v are the initial and final velocities of a particle i.e. $a = \frac{(v-u)}{t}$ then impulse $I =$

- (A) $\frac{(a-u)}{t}$
- ☒ (B) $m(v-u)$
- (C) at
- (D) ma
- (E) Answer not known

176. The effective distance of the particle of a body from its axis of rotation is called
- (A) moment of inertia
 - ☒ (B) radius of gyration
 - (C) angular momentum
 - (D) momentum
 - (E) Answer not known
177. Convert the following energy value into eV $E = 9 \times 10^{20}$ ergs
($\because 1eV = 1.602 \times 10^{-12}$ ergs.)
- (A) $1.78 \times 10^{-33} eV$
 - (B) $1.78 \times 10^{33} eV$
 - (C) $5.618 \times 10^{-32} eV$
 - ☒ (D) $5.618 \times 10^{32} eV$
 - (E) Answer not known
178. A steel balls is let fall through a height of 0.64 m on a plate of steel. The height through which it rebounds is 0.36 m. Calculate the co-efficient of restitution $e = ?$ (here $e^2 = \frac{h_1}{h}$)
- (A) 1.25
 - (B) 2.75
 - ☒ (C) 0.75
 - (D) 1.75
 - (E) Answer not known

179. A body of mass (m), moving with velocity v , the K.E of the body is $F_k = mc^2 - m_0c^2$ and rest mass energy is m_0c^2 . The total energy of the body is

- (A) $-m_0c^2$
- ☒ (B) mc^2
- (C) $mc^2 - 2m_0c^2$
- (D) $mc^2 - m_0c^2$
- (E) Answer not known

180. Which of the following statement is the correct for the one of the postulates of special theory of relativity?

- (i) The laws of motion are the same for all mechanical system.
 - (ii) The laws of physics are the same for all inertial frames of reference.
 - (iii) The laws of conservation of momentum are the same for all physical system.
- (A) (i) and (iii) only
 - ☒ (B) (ii) only
 - (C) (ii) and (iii) only
 - (D) (i) and (ii) only
 - (E) Answer not known

181. Which of the following statement is correct?

- (i) Fermented drinks are alcoholic beverages
- (ii) Brewed and Fermented drinks are alcoholic beverages
- (iii) Carbonated drinks are alcoholic beverages
- (iv) Distilled drinks are alcoholic beverages
- (A) (i) (ii) and (iii) are correct
- (B) (i) (iii) and (iv) are correct
- (C) (ii) (iii) and (iv) are correct
- ☒ (D) (i) (ii) and (iv) are correct
- (E) Answer not known

182. Fusel oil is related to

- (A) Lubricating oils
- (B) Vegetable oil
- ☒ (C) Group of Aliphatic Alcohols
- (D) Gasoline
- (E) Answer not known

183. Fuel ethanol usually denotes anhydrous ethanol denatured by addition of _____ % of unleaded gasoline.

- (A) 0.5 to 1 %
- (B) 1 to 2 %
- ☒ (C) 2 to 5 %
- (D) 5 to 10 %
- (E) Answer not known

184. In Narcotic drugs, the best known true Hallucinogens are

- (A) Cocaine
- ☒ (B) LSD
- (C) Heroin
- (D) Nitrazepam
- (E) Answer not known

185. Match the following :

- | | |
|------------------|--------------------------|
| (a) Marihuana | 1. Dillie-koppanyi test |
| (b) Cocaine | 2. Ehrlich's test |
| (c) Barbiturates | 3. Dequenois-Levine test |
| (d) LSD | 4. Scott test |

- | | (a) | (b) | (c) | (d) |
|--------------------------------------|------------------|-----|-----|-----|
| ☒ (A) | 3 | 4 | 1 | 2 |
| (B) | 2 | 3 | 1 | 4 |
| (C) | 4 | 3 | 2 | 1 |
| (D) | 3 | 4 | 2 | 1 |
| (E) | Answer not known | | | |

186. Fentanyl is

- (i) More potent than morphine
 - (ii) A natural opioid
 - (iii) A semi-synthetic opioid
 - (iv) Less potent than morphine
- (A) (i) and (ii) are correct
☒ (B) (i) is correct
(C) (ii) and (iv) are correct
(D) (iii) is correct
(E) Answer not known

187. Match the following :

- | | |
|-------------------------------------|-------------------------|
| (a) Tear gases | 1. Chlorine |
| (b) Nerve poison | 2. Mustard gas |
| (c) Sternutators
(Vomitting gas) | 3. Chloro aceto phenone |
| (d) Choking gases | 4. Carbon monoxide |
| (e) Vesicants
(blister gases) | 5. Arsine compounds |

- | | (a) | (b) | (c) | (d) | (e) |
|---|------------------|-----|-----|-----|-----|
| (A) | 2 | 5 | 4 | 1 | 3 |
| (B) | 3 | 1 | 2 | 5 | 4 |
| (C) | 4 | 3 | 5 | 2 | 1 |
| ☒ (D) | 3 | 4 | 5 | 1 | 2 |
| (E) | Answer not known | | | | |

188. Which of these is not a plant poison?

- | | |
|---|--------------|
| ☒ (A) Arsenic | (B) Aconite |
| (C) Abrus | (D) Capsicum |
| (E) Answer not known | |

189. The technique 'Polymerase Chain Reaction' (PCR) which revolutionized individualization in biological forensic samples was invented by

- (A) Alec Jeffrays
☒ (B) Kary Mullis
(C) John Buffer
(D) Karl Landsfeiner
(E) Answer not known

190. The presence of which of the following is an unambiguous test for seminal fluid in the vaginal smear from a sexual assault victim.
- (A) Blood stain
 - (B) Prostate Specific Antigen (PSA)
 - ☒ (C) Sperm Cells
 - (D) Yeast Cells
 - (E) Answer not known
191. Blood grouping of dried stains in forensic serology is based on
- ☒ (A) Red cell antigen Polymorphism
 - (B) Single Nucleotide Polymorphism
 - (C) Insertion/Deletion Polymorphism
 - (D) Copy Number variation
 - (E) Answer not known
192. Biological evidence materials such as blood and other body fluid stains can be individualized by
- ☒ (A) DNA profiling
 - (B) Blood grouping
 - (C) Species Origin Determination
 - (D) Cross-over Immuno Electrophoresis
 - (E) Answer not known

193. Which of the following antigens does a type O individual have?
- (A) A antigen
 - (B) B antigen
 - (C) A and B antigens
 - ☒ (D) Neither (A) nor (B) antigens
 - (E) Answer not known
194. Which of the following is the most sensitive presumptive colour test for blood involves which a proven carcinogenic?
- (A) Kastle-Meyer Test
 - ☒ (B) Benzidine Test
 - (C) Luminol Test
 - (D) Bluestar Test
 - (E) Answer not known
195. The type of scale pattern in Human Hair is
- (A) Coronal
 - ☒ (B) Spinous
 - ☒ (C) Imbricate
 - (D) Irregular wave
 - (E) Answer not known
196. A very useful method for visual display of audio forensic recording is
- (A) tape recordings
 - ☒ (B) the spectrogram
 - (C) the chromatogram
 - (D) audograph
 - (E) Answer not known

197. Characterization of paint pigments can be identified by which technique.
- (A) Absorption Spectroscopy
 - (B) Magnetic Spectroscopy
 - (C) Adsorption Spectroscopy
 - ☒ (D) Emission Spectroscopy
 - (E) Answer not known
198. How should glass fragments be packed and forwarded for forensic examination?
- ☒ (A) In solid containers
 - (B) In paper envelope
 - (C) Druggist fold
 - (D) In polythene bags
 - (E) Answer not known
199. Partially visible depressions on a sheet of paper underneath the one of which the visible writing was done is called as
- ☒ (A) Indented writings
 - (B) Obliterated writings
 - (C) First page writings
 - (D) Cursive writings
 - (E) Answer not known
200. A nondestructive method used for ink lines comparison is
- (A) UV spectrophotometer
 - ☒ (B) Visible microspectrophotometer
 - (C) IR spectroscopy
 - (D) Capillary electrophoresis
 - (E) Answer not known
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