## 040/21

## Question Booklet Alpha Code



Total Number of Questions : 100
Time : 75 Minutes

Maximum Marks : 100

## INSTRUCTIONS TO CANDIDATES

1. The Question Paper will be given in the form of a Question Booklet. There will be four versions of Question Booklets with Question Booklet Alpha Code viz. A, B, C \& D.
2. The Question Booklet Alpha Code will be printed on the top left margin of the facing sheet of the Question Booklet.
3. The Question Booklet Alpha Code allotted to you will be noted in your seating position in the Examination Hall.
4. If you get a Question Booklet where the alpha code does not match to the allotted alpha code in the seating position, please draw the attention of the Invigilator IMMEDIATELY.
5. The Question Booklet Serial Number is printed on the top right margin of the facing sheet. If your Question Booklet is un-numbered, please get it replaced by new Question Booklet with same alpha code.
6. The Question Booklet will be sealed at the middle of the right margin. Candidate should not open the Question Booklet, until the indication is given to start answering.
7. Immediately after the commencement of the examination, the candidate should check that the Question Booklet supplied to him/her contains all the 100 questions in serial order. The Question Booklet does not have unprinted or torn or missing pages and if so he/she should bring it to the notice of the Invigilator and get it replaced by a complete booklet with same alpha code. This is most important.
8. A blank sheet of paper is attached to the Question Booklet. This may be used for rough work.
9. Please read carefully all the instructions on the reverse of the Answer Sheet before marking your answers.
10. Each question is provided with four choices (A), (B), (C) and (D) having one correct answer. Choose the correct answer and darken the bubble corresponding to the question number using Blue or Black Ball Point Pen in the OMR Answer Sheet.
11. Each correct answer carries 1 mark and for each wrong answer $1 / 3$ mark will be deducted. No negative mark for unattended questions.
12. No candidate will be allowed to leave the examination hall till the end of the session and without handing over his/her Answer Sheet to the Invigilator. Candidates should ensure that the Invigilator has verified all the entries in the Register Number Coding Sheet and that the Invigilator has affixed his/her signature in the space provided.
13. Strict compliance of instructions is essential. Any malpractice or attempt to commit any kind of malpractice in the Examination will result in the disqualification of the candidate.

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1. What is the Point Group of Naphthalene ?
A) C 2 v
B) C 2 h
C) D2h
D) D2d
2. If a molecule is having the following symmetry element IR active vibrational modes are Raman inactive and vice versa
A) Cn
B) Sn
C) $\sigma v$
D) i
3. Which of the following molecule does not show rotational spectrum ?
A) HCl
B) IF
C) CO
D) $\mathrm{H}_{2}$
4. Number of Vibrational modes in $\mathrm{CO}_{2}$ is
A) 4
B) 3
C) 2
D) 1
5. If $A$ and $B$ are two operators which commute with one another, then the commutator operator, $[A, B]$ is called $\qquad$ operator.
A) Hermitian
B) Linear
C) Zero
D) Laplacian
6. For orbitals with $I \neq 0$, number of nodes in any radial function is given by
A) $n-I-1$
B) $n-I$
C) I-1
D) $n+1$
7. For reactions having half life time $10^{-6}$ or less the method used for the study of fast reaction
A) Flash photolysis
B) Pulse radiolysis
C) Stopped flow method
D) Relaxation method
8. Mean free path of a gas molecule is inversely proportional to
A) Temperature
B) Pressure
C) Velocity
D) Boltzmann constant
9. At high substrate concentration, enzyme catalysed reaction becomes $\qquad$ order reaction.
A) Zero
B) One
C) Two
D) Three
10. Half life of a reaction doubles when initial concentration is reduced to half. What is the order of the reaction?
A) Zero
B) One
C) Two
D) Three
11. Number of isomeric derivatives for neutral closo carborane, $\mathrm{C}_{2} \mathrm{~B}_{10} \mathrm{H}_{12}$ is
A) Two
B) Three
C) Five
D) Four

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12. The molar conductivities at infinite dilution of $\mathrm{NaCl}, \mathrm{Nal}$ and Rbl are 12.7, 10.8 and $9.1 \mathrm{mS} \mathrm{m}^{2} \mathrm{~mol}^{-1}$ respectively. The molar conductivity at infinite dilution of RbCl is
A) $22 \mathrm{mS} \mathrm{m}^{2} \mathrm{~mol}^{-1}$
B) $33 \mathrm{mS} \mathrm{m}^{2} \mathrm{~mol}^{-1}$
C) $11 \mathrm{mS} \mathrm{m}^{2} \mathrm{~mol}^{-1}$
D) $44 \mathrm{mS} \mathrm{m}^{2} \mathrm{~mol}^{-1}$
13. The ground state term symbol of $\mathrm{Nb}(Z=41)$ is ${ }^{6} \mathrm{D}$. The electronic configuration corresponding to this term symbol is
A) $[\mathrm{Kr}] 4 \mathrm{~d}^{4} 5 \mathrm{~S}^{1}$
B) $[K r] 4 d^{3} 5 S^{2}$
C) $[K r] 4 d^{5} 5 S^{0}$
D) $[\mathrm{Kr}] 4 \mathrm{~d}^{3} 5 \mathrm{~S}^{1} 5 \mathrm{P}^{1}$
14. For an electron in a three dimensional rectangular box of dimensions $L x=1 \times 10^{-15} \mathrm{~m}$, $L y=1.5 \times 10^{-15} \mathrm{~m}, \mathrm{Lz}=2 \times 10^{-15} \mathrm{~m}$. Calculate the zero point energy.
A) $2.01 \times 10^{-7} \mathrm{~J}$
B) $1.01 \times 10^{-7} \mathrm{~J}$
C) $3.01 \times 10^{-7} \mathrm{~J}$
D) $4.01 \times 10^{-7} \mathrm{~J}$
15. In the IR spectrum of cyclohexanone, the carbonyl absorption band appears at
A) $1760 \mathrm{~cm}^{-1}$
B) $1715 \mathrm{~cm}^{-1}$
C) $1670 \mathrm{~cm}^{-1}$
D) $1700 \mathrm{~cm}^{-1}$
16. Calculate the angle at which first order reflection will occur in an X-ray spectrophotometer when X-rays of wavelength $1.54 \AA$ Are diffracted by the atoms of the crystal, given that the inter planar distance is $4.04 \AA$.
A) $22^{\circ}$
B) $14^{\circ}$
C) $27^{\circ}$
D) $11^{\circ}$
17. For the deposition of Pb by electroplating which is the most suitable compound among the following
A) $\mathrm{PbSO}_{4}$
B) $\mathrm{PbCl}_{2}$
C) $\mathrm{Pb}\left(\mathrm{BF}_{4}\right)_{2}$
D) $\mathrm{Pb}(\mathrm{Et})_{4}$
18. Total number of hyperfine EPR lines for octahedral high spin Mn (II) complexes ( $\mathrm{I}=5 / 2$ for Mn ) is
A) 30
B) 36
C) 24
D) 33
19. No. of signals expected in the CNMR spectrum of anthracene is
A) 8
B) 6
C) 4
D) 2
20. During addition of polymerization, the reaction proceeds via
A) Step growth process
B) Free radical chain reaction
C) Addition reaction
D) Cascade process
21. Which of the following will not result in deviation from Beer's Law ?
A) Change in refractive index of the medium
B) Dissociation of the analyte on dilution
C) Polychromatic light
D) Path length of cuvette

A
22. The ratio of relative intensities of signals in the first order carbon NMR spectrum of $\mathrm{CD}_{3} \mathrm{Cl}$ is
A) $1: 3: 6: 7: 6: 3: 1$
B) $1: 2: 1$
C) $1: 4: 6: 4: 1$
D) $1: 3: 3: 1$
23. Configurations of carbon atoms $\mathrm{C}_{3}$ and $\mathrm{C}_{4}$ in D-ribose are
A) $R$ and $S$
B) $S$ and $R$
C) $S$ and $S$
D) $R$ and $R$
24. $S$ and $L$ value of ${ }^{15} \mathrm{~N}$ is
A) $1 / 2$ and 0
B) $3 / 2$ and 0
C) 1 and 0
D) $1 / 2$ and 1
25. pH of an aqueous solution containing $\left[\mathrm{H}^{+}\right]=3 \times 10^{-3} \mathrm{M}$ is
A) 2.471
B) 2.523
C) 2.756
D) 3
26. Which of the following aqueous solutions $(0.01 \mathrm{M})$ have the highest boiling point ?
A) Glucose
B) Urea
C) NaCl
D) $\mathrm{ZnSO}_{4}$
27. Zero point energy of SHO whose vibrational frequency is $v$, is given by
A) hv
B) $h v / 2$
C) $\mathrm{hv} / 3$
D) $h v / 4$
28. Which hydrocarbon is known as Marsh gas ?
A) Butane
B) Propane
C) Ethane
D) Methane
29. Which of the following is not an ortho para directing group ?
A) Methyl
B) Hydroxy
C) Amino
D) Nitro
30. This compound is identified as the chief component of oil of winter green is
A) Methyl salicylate
B) Phenyl salicylate
C) Acetyl salicylic acid
D) Amino salicylic acid
31. Total yield in mitochondrial breakdown of pyruvate per glucose molecule is
A) 25 ATP
B) 28 ATP
C) 30 ATP
D) 36 ATP
32. Zellweger's syndrome is caused by
A) $\beta$-oxidation
B) $\alpha$-oxidation
C) $\omega$-oxidation
D) Both B) and C)
33. Which of the following is the inhibitor of complex III ?
A) Rotenone
B) Antimycin A
C) Amytal
D) Pteridicin A

A

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34. Match the following :
35. Southern blotting
A. Alwine
36. Western blotting
B. E. M. Southern
37. Northern blotting
C. A. Jeffrey
38. DNA fingerprinting
D. Towbin
A) $1-\mathrm{A}, 2-\mathrm{C}, 3-\mathrm{D}, 4-\mathrm{B}$
B) $1-\mathrm{B}, 2-\mathrm{D}, 3-\mathrm{A}, 4-\mathrm{C}$
C) $1-B, 2-A, 3-D, 4-C$
D) $1-B, 2-C, 3-A, 4-C$
39. The lipoprotein possessing the highest quantity of phospholipid
A) HDL
B) LDL
C) VLDL
D) Chylomicrons
40. To avoid ketosis, the total content of fat (F) must not exceed which of the following sum of carbohydrate (C) and protein (P) ?
A) $\mathrm{C}+\mathrm{P}$
B) $2 \mathrm{C}+\mathrm{P}$
C) $2 C+1 / 2 P$
D) $C+2 P$
41. Fischer's lock and key model cannot explain
A) Inactivation due to denaturation
B) Allosteric modulation
C) Competitive inhibition
D) Saturation kinetics
42. Which of the following sequence is correct in cholesterol synthesis ?
A) Mevalonate $\rightarrow$ Isoprenoid units $\rightarrow$ Squalene $\rightarrow$ Lanosterol
B) Mevalonate $\rightarrow$ Squalene $\rightarrow$ Isoprenoid units $\rightarrow$ Lanosterol
C) Mevalonate $\rightarrow$ Isoprenoid units $\rightarrow$ Lanosterol $\rightarrow$ Squalene
D) Mevalonate $\rightarrow$ Lanosterol $\rightarrow$ Isoprenoid units $\rightarrow$ Squalene
43. Find out the mismatch between amino acid and its corresponding amine.
A) Cysteine- $\beta$-mercapto ethanol amine
B) Glutamic acid- $\gamma$-amino butyric acid
C) Ornithine-cadaverine
D) Histidine-Histamine
44. A one year old female patient is lethargic, weak and anemic. Her height and weight are both low for her age. Her urine contains an elevated level of orotic acid. The administration of which of the following compounds is most likely to alleviate her symptoms?
A) Thymidine
B) Uridine
C) Guanine
D) Adenine
45. Which immunoglobulin does play role in hypersensitivity reactions and defend the body from helminthic parasites ?
A) $\lg G$
B) $\lg A$
C) $\lg D$
D) $\lg E$
46. The resolving power of TEM is derived from
A) Electrons
B) Specimens
C) Power
D) Ocular system

A
43. Which of the following metabolic disorder of phenyl alanine and tyrosine metabolic pathway does not match to its defective enzyme?
A) Phenyl ketonuria - Phenyl alanine hydroxylase
B) Tyrosinaemia Type I - Hydrolase
C) Tyrosinaemia Type II - Hydroxylase
D) Alkaptonuria - Homogentisate oxidase
44. A sedentary fifty-year-old man weighing 80 kg requests a physical examination. He denies any health problems. Routine blood analysis is unremarkable except for plasma cholesterol of $280 \mathrm{mg} / \mathrm{dl}$. The man refuses drug therapy for his hypercholesterolemia. Analysis of a one-day dietary recall showed the following :

| Kilocalories | 3475 kcal | Cholesterol | 822 mg |
| :--- | :--- | :--- | :--- |
| Protein | 102 g | Saturated fat | 69 g |
| Carbohydrates | 383 g | Total fat | 165 g |
| Fiber-Crude | 6 g |  |  |

Changes in which one of the following dietary components would have the greatest effect in lowering plasma cholesterol ?
A) Cholesterol
B) Saturated fat
C) Polyunsaturated fat
D) Carbohydrate
45. Pulse field gel electrophoresis separates DNA molecule of size
A) $10-20 \mathrm{bp}$
B) $20-30 \mathrm{~kb}$
C) $30-50 \mathrm{~kb}$
D) $40-50 \mathrm{bp}$
46. Amino sugars (Hexosamines) are not the constituents of which one of the following ?
A) Hyaluronic acid
B) Chondroitin Sulphate
C) Erythromycin and carbomycin
D) Streptomycin
47. Diphtheria toxin inhibits translation by biding with
A) elF-2
B) 40 S subunit of ribosome
C) eEF-2
D) 60 S subunit of ribosome
48. An enzyme of purine metabolism associated with immunodeficiency disease
A) Adenosine deaminase
B) Xanthine oxidase
C) PRPP synthetase
D) HGPRT
49. Ketone bodies are not utilized or oxidized in which one of the following tissues ?
A) Heart
B) Brain
C) Liver
D) Muscles

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50. A teenager concerned about his weight attempts to maintain a fat-free diet for a period of several weeks. If his ability to synthesize various lipids were examined, he would be found to be most deficient in his ability to synthesize
A) Triacylglycerol
B) Phospholipids
C) Cholesterol
D) Prostaglandins
51. A tRNA molecule that is supposed to carry cysteine (tRNA ${ }^{\text {cys }}$ ) is mischarged, so that it actually carries alanine (ala-tRNA ${ }^{\text {cys }}$ ). What will be the fate of this alanine residue during protein synthesis?
A) It will be incorporated into a protein in response to an alanine codon
B) It will be incorporated into a protein in response to a cysteine codon
C) It will remain attached to the tRNA, as it cannot be used for protein synthesis
D) It will be chemically converted to cysteine by cellular enzymes
52. Which of the sequence of formation of initiation complex during translation with the help of initiation factors?
A) $30 \mathrm{~S} \rightarrow$ mRNA $\rightarrow$ f-Met-tRNA $\rightarrow 50 \mathrm{~S}$
B) $50 \mathrm{~S} \rightarrow \mathrm{mRNA} \rightarrow$ f-Met-tRNA $\mathrm{f}_{\mathrm{f}} \rightarrow 30 \mathrm{~S}$
C) $50 \mathrm{~S} \rightarrow$ f-Met-tRNA $\rightarrow$ mRNA $\rightarrow 30 \mathrm{~S}$
D) $30 \mathrm{~S} \rightarrow$ f-Met-tRNA $\rightarrow$ mRNA $\rightarrow 50 \mathrm{~S}$
53. How many DNA duplexes are obtained from one DNA duplex after 4 cycles of PCR ?
A) 8
B) 4
C) 32
D) 16
54. In hemolytic jaundice Vandenberg reaction is
A) Indirect positive
B) Direct positive
C) Biphasic
D) None of these
55. The following is the sum of three steps in the citric acid cycle
$\mathrm{A}+\mathrm{B}+\mathrm{FAD}+\mathrm{H}_{2} \mathrm{O} \longrightarrow \mathrm{C}+\mathrm{FADH}_{2}+\mathrm{NADH}$

Reactant $A$
A) Succinyl CoA
B) Succinate
C) Fumarate
D) Succinate

Reactant B
GDP
NAD+
NAD+
NAD+

## Reactant C

Succinate
Oxaloacetate
Oxaloacetate
Malate
56. Which one of the following statements concerning the binding of oxygen by haemoglobin is correct?
A) The Bohr effect results in a lower affinity for oxygen at higher pH values
B) Carbon dioxide increases the oxygen affinity of haemoglobin by binding to the amino terminal groups of the polypeptide chains
C) The oxygen affinity of haemoglobin increases as the percent saturation increases
D) The haemoglobin tetramer binds four molecules of 2, 3-BPG
57. Passive immunity is obtained by injecting
A) Antibiotics
B) Antigens
C) Antibodies
D) Vaccines
58. Mobilization of stored iron occurs in which of the following sequences ?
A) Ferritin of RE system $\rightarrow$ Ferritin of intestinal mucosal cells $\rightarrow$ Absorption from Intestine
B) Ferritin of intestinal mucosal cells $\rightarrow$ Absorption from intestine $\rightarrow$ Ferritin of RE system
C) Ferritin of RE system $\rightarrow$ Absorption from intestine $\rightarrow$ Ferritin of intestinal mucosal cells
D) Absorption from intestine $\rightarrow$ Ferritin of intestinal mucosal cells $\rightarrow$ Ferritin of RE system
59. Which one of the following statements about the urea cycle is correct?
A) The two nitrogen atoms that are incorporated into urea enter the cycle as ammonia and alanine
B) Urea is produced directly by the hydrolysis of ornithine
C) ATP is required for the reaction in which argininosuccinate is cleaved to form arginine
D) Urinary urea is increased by a diet rich in protein
60. Shine-Delgarno sequence is present in which of the following RNA ?
A) tRNA
B) mRNA
C) rRNA
D) SnRNA
61. The suprasegmental feature juncture is related to
A) Intonation
B) Duration
C) Stress
D) Tone
62. Which of the following are examples of physiological biometric ?

1. Retina
2. Thermogram
3. Keystroke dynamics
A) 1 and 3 only
B) 1, 2 and 3
C) 2 and 3 only
D) 1 and 2 only
4. Which of the following are useful to determine location of a given mobile device ?
5. Time Difference of Arrival
6. Time of Arrival
7. Enhanced Observed Time Difference
A) 1, 2 and 3
B) 1 and 2 only
C) 1 and 3 only
D) 2 and 3 only

A

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64. Statement - I: One of the primary technologies used to detect deception with brain-based measures is Event-Related Potentials (ERPs).
Statement - II : ERPs are derived from the Electroencephalogram (EEG).
A) Statement - I is true and Statement - II is false
B) Statement - I is false and Statement - II is true
C) Both Statement - I and Statement - II are false
D) Both Statement - I and Statement - II are true
65. A three-barrelled long firearm with a combination of smooth and rifled barrels is better known as
A) Vierling
B) Drilling
C) Machine gun
D) Sub-machine gun
66. The most common calibre of tear-gas ammunition encountered is
A) 6 mm
B) 8 mm
C) 9 mm
D) 12 mm
67. Velocity of recoil of a gun weighing 3 kilograms firing a 100 gram bullet at 300 metre/second is
A) 1 metre/second
B) 3 metre/second
C) 6 metre/second
D) 9 metre/second
68. Which of the following ASTM standards are for separation of ignitable liquid residue from fire debris ?
69. ASTM E1386-00
70. ASTM E1412-00
71. ASTM E1413-00
72. ASTM E2388-00
A) 1, 2 and 4 only
B) 2, 3 and 4 only
C) 1, 2 and 3 only
D) 1, 3 and 4 only
73. The common shapes of crystalline pigments are
74. Spherical
75. Cubic
76. Rectangular
77. Needle-shaped
A) 1, 2 and 3 only
B) 1, 2 and 4 only
C) 1, 3 and 4 only
D) 2, 3 and 4 only

## A

70. Which of the following ASTM guidelines are for examination of Portland cement clinker?
71. ASTM C114-18
72. ASTM C1356-07
73. ASTM C1365-18
74. ASTM C1872-18e2
A) 1 and 2 only
B) 2 and 3 only
C) 3 and 1 only
D) 4 and 2 only
75. Abnormal situations of hair growth where excessive growth of hair take place are
76. Hirsutism
77. Alopecia
78. Hypertrichosis
79. Hypotrichosis
A) 1 and 2 only
B) 2 and 3 only
C) 3 and 1 only
D) 4 and 1 only
80. Particle size of sand in terms of grain size is
A) 64 mm to 2048 mm
B) 2 mm to 64 mm
C) 63 microns to 2000 microns
D) 2 microns to 63 microns
81. Perspective grid method of crime scene sketching is best utilized for
82. Traffic accident case
83. Indoor scene
84. Dense forest type of scene
A) 1 and 2 only
B) 2 and 3 only
C) 1 and 3 only
D) 1, 2 and 3
85. Lakshadweep is under jurisdiction of which of the following CFSL ?
A) CFSL, Kolkata
B) CFSL, Hyderabad
C) CFSL, Pune
D) CFSL, Bhopal
86. NICFS was renamed after the name of Lok Nayak Jayaprakash Narayan in the year
A) 1976
B) 1983
C) 1991
D) 2003
87. The appellate jurisdiction of the Supreme Court can be invoked by a certificate granted by the High Court concerned under Article
88. 125
89. 132(1)
90. 133(1)
91. 134
A) 1, 2 and 3
B) 1, 3 and 4
C) 1, 2 and 4
D) 2, 3 and 4

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77. According to Casper's dictum, time taken for the same amount of putrefaction to occur when body is in air, water and buried in earth is in the ratio of
A) $8: 1: 2$
B) $1: 2: 8$
C) $4: 1: 3$
D) $3: 1: 4$
78. Which of the following are characteristics observed in antemortem wounds ?
79. No hemorrhage
80. Cellular proliferation and infiltration
81. Absence of spurting
82. Staining of wound edges

Choose the correct option :
A) 1 and 2 only
B) 2 and 3 only
C) 2 and 4 only
D) 3 and 4 only
79. In Tsuchihashi classification, reticulate grooves belong to which of the following type of lip prints ?
A) Type I
B) Type II
C) Type III
D) Type IV
80. As per Gosta Gustafson's method, which of the following is the single most reliable criteria for determination of age from teeth in dead?
A) Secondary dentin
B) Cementum apposition
C) Root resorption
D) Transparency of root
81. Running amok is a culture bound syndrome observed due to consumption of which of the following plant poisons?
A) Cannabis sativa
B) Digitalis purpurea
C) Abrus precatorius
D) Atropa belladonna
82. Statement - I: Oral administration of heroin is 1.5 times more potent than that of morphine.
Statement - II : 6-monoacetyl morphine is more potent $\mu$ agonist than morphine.
In the light of the above two statements choose the correct option :
A) Both Statement - I and Statement - II are true
B) Both Statement - I and Statement - II are false
C) Statement - I is true, but Statement - II is false
D) Statement - I is false, but Statement - II is true
83. Match the following List - I with List - II :

List - I
a. Organochlorines
b. Pyrethroids
c. Organophosphorus
d. Carbamates
d. iv. Dieldrin

Choose the correct option from those given below :

|  | a | b | c | d |
| :--- | :---: | :---: | :---: | :---: |
| A) | ii | i | iv | iii |
| B) | i | ii | iii | iv |
| C) | iii | iv | ii | i |
| D) | iv | i | ii | iii |

84. Hooch tragedy is a term associated with spurious consumption of which of the following?
A) Dhatura
B) Opium
C) Cocaine
D) Illicit liquor
85. Which of the following bending vibrations are observed in IR spectroscopy, which causes two atoms move either above or below with respect to plane of central atom?
A) Rocking
B) Twisting
C) Scissoring
D) Wagging
86. Arrange the following in correct sequence for Atomic Mass Spectrometric Analysis.
87. Separation of ion based on $\mathrm{m} / \mathrm{z}$ ratio
88. Ionization
89. Measuring the ion current
90. Atomization

Choose the correct option :
A) $4,2,1,3$
B) 2, 4, 1, 3
C) $2,1,3,4$
D) $1,2,3,4$
87. Which of the following is the characteristics of the ideal detector for Gas

Chromatography?

1. Good stability and reproducibility
2. Nonlinear response to solutes
3. Short response time
4. Poor reliability

Choose the correct option :
A) 1, 2 and 3 only
B) 2, 3 and 4 only
C) 1 and 3 only
D) 2 and 4 only

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88. Which of the following is the correct sequence of $F$-number with respect to passage of light through the lens ?
A) $F / 2.0>F / 2.8>F / 4.0>F / 5.6$
B) $F / 2.8>F / 2.0>F / 4.0>F / 5.6$
C) $F / 4.0>F / 5.6>F / 2.8>F / 2.0$
D) $F / 5.6>F / 4.0>F / 2.8>F / 2.0$
89. Match the following List - I with List - II :

> List - I
a. Double diffusion in one dimension
b. Single diffusion in two dimensions
c. Double diffusion in two dimensions
d. Single diffusion in one dimension

## List - II

i. Ouchterlony method
ii. Mancini method
iii. Oudin method
iv. Oakley-Fulthorpe method

Choose the correct option from those given below :

|  | a | b | c | d |
| :--- | :---: | :---: | :---: | :---: |
| A) | i | iii | iv | ii |
| B) | iv | ii | i | iii |
| C) | i | ii | iii | iv |
| D) | iv | iii | i | ii |

90. Which of the following methods for determination of blood group in dried bloodstain is based on the detection of antibody?
A) Absorption elution method
B) Lattes' crust method
C) Mixed agglutination method
D) Absorption inhibition method
91. Reaction in Barberio's test for the chemical examination of seminal fluid detects the presence of which of the following ?
A) Spermine
B) Pyruvate
C) Choline
D) Ascorbic acid
92. Which of the following polymorphic markers shows the least variation between individuals?
A) D18S51
B) TPOX
C) D21S11
D) FGA
93. "Squash" on the printed document is the characteristics of which of the following printing techniques ?
A) Gravure
B) Lithography
C) Letterpress
D) Laser

A
94. Which of the following are considered as elements of execution?

1. Line Quality
2. Line Continuity
3. Arrangement
4. Alignment
A) 1, 2 and 3 only
B) 1, 2 and 4 only
C) 1, 3 and 4 only
D) 2, 3 and 4 only
5. Inability to write the correct words is better known as
A) Motor agraphia
B) Amnesic agraphia
C) Agnostic agraphia
D) Paragraphia
6. A document written entirely written and signed by the same person is better known as
A) Holograph
B) Genuine document
C) Pilcrow
D) Recto document
7. A metal is suitable for casting of tool marks, if its
A) Melting point is high
B) Specific gravity is high
C) Melting point is low
D) Specific gravity is low
8. Which of the following is a tire mark that occurs from rapid deflation of a tire on the revolving wheel rim ?
A) Flat tire mark
B) Skid mark
C) Acceleration mark
D) Yaw mark
9. "An accused person is not criminally responsible, if his unlawful act is the product of mental disease of metal defect." The statement is better known as
A) McNaughten's rule
B) Durrham's rule
C) Curren's rule
D) Doctrine of Diminished responsibility
10. Under which of the following Section of Wildlife (Protection) Act, 1972, a wild animal shall be a Government property?
A) $23(2)$
B) 13
C) 54
D) $39(1)$

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Space for Rough Work

