Question Booklet Alpha Code



Total Number of Questions : 100

Time: 75 Minutes

Question Booklet

SI. No

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.
- 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.
- 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.

1.	What is the Point Gro A) C2v	pup of Naphthalene ? B) C2h	C) D2	2h	D) D2d
2.	If a molecule is havir are Raman inactive a		etry ele	ement IR active	vibrational modes
	A) Cn	B) Sn	C) σν	/	D) i
3.	Which of the followin A) HCl	g molecule does not s B) IF	show ro C) C(ım ? D) H ₂
4.	Number of Vibrationa	al modes in CO ₂ is			
	A) 4	B) 3	C) 2		D) 1
5.	If A and B are two op operator, [A, B] is ca	erators which commu		one another, the	en the commutator
	A) Hermitian	B) Linear	C) Ze	ero	D) Laplacian
6.	For orbitals with $I \neq 0$		-	-	•
	A) n – I – 1	B) n – I	C) I –	- 1	D) n + l
7.	For reactions having reaction	half life time 10 ⁻⁶ or l	ess the	e method used fo	or the study of fast
	A) Flash photolysis	h a d		ulse radiolysis	al
	C) Stopped flow met	nou	D) RE	elaxation metho	ia.
8.	Mean free path of a g A) Temperature	gas molecule is invers		portional to ressure	
	C) Velocity		,	oltzmann consta	ant
9.	At high substrate con	centration, enzyme ca	atalysed	d reaction becor	mes
	order reaction. A) Zero	B) One	C) Tv	NO	D) Three
10.	Half life of a reaction the order of the reaction		concen	ntration is reduc	ed to half. What is
	A) Zero	B) One	C) Tv	NO	D) Three
11.	Number of isomeric of A) Two	derivatives for neutral B) Three	closo c C) Fiv		₁₀ H ₁₂ is D) Four

12. The molar conducti 9.1 mS m ² mol ^{−1} re A) 22 mS m ² mol ^{−1} C) 11 mS m ² mol ^{−1}	spectively. The molar		e dilution of RbCl is
 The ground state to corresponding to the A) [Kr]4d⁴5S¹ 	-		ctronic configuration D) [Kr]4d ³ 5S ¹ 5P ¹
	three dimensional recta Lz = 2×10^{-15} m. Cal B) 1.01 × 10 ⁻⁷ J	culate the zero point	
15. In the IR spectrum A) 1760 cm ⁻¹	of cyclohexanone, the B) 1715 cm ⁻¹		
 Calculate the angle a when X-rays of way that the inter planar A) 22° 	velength 1.54 Å are di		
17. For the deposition of the followingA) PbSO₄	f Pb by electroplating w B) PbCl ₂		
18. Total number of hy (I = 5/2 for Mn) is A) 30	perfine EPR lines for c B) 36	octahedral high spin M C) 24	In (II) complexes D) 33
19. No. of signals expe A) 8	cted in the CNMR spe B) 6	ctrum of anthracene i C) 4	s D) 2
20. During addition of pA) Step growth proC) Addition reaction	cess	ction proceeds via B) Free radical cha D) Cascade proces	
, .	ctive index of the med he analyte on dilution ght		aw ?

22.	The ratio of relative in CD_3CI is			n NMR spectrum of
	 A) 1:3:6:7:6:3 C) 1:4:6:4:1 	:1	B) 1:2:1 D) 1:3:3:1	
23.	Configurations of car A) R and S	bon atoms C ₃ and C ₂ B) S and R	₁ in D-ribose are C) S and S	D) R and R
24.	S and L value of 15 N A) $\frac{1}{2}$ and 0	-	C) 1 and 0	D) 1/2 and 1
25.	pH of an aqueous so A) 2.471	lution containing [H ⁺] B) 2.523	= 3 × 10 ⁻³ M is C) 2.756	D) 3
26.	Which of the following A) Glucose	g aqueous solutions (B) Urea	(0.01 M) have the high C) NaCl	nest boiling point ? D) ZnSO ₄
27.	Zero point energy of A) hv	SHO whose vibration B) hv/2	al frequency is v, is g C) hv/3	iven by D) hv/4
28.	Which hydrocarbon is A) Butane	s known as Marsh ga B) Propane	s ? C) Ethane	D) Methane
29.	Which of the following A) Methyl	g is not an ortho para B) Hydroxy	directing group ? C) Amino	D) Nitro
30.	This compound is ideA) Methyl salicylateC) Acetyl salicylic ac		omponent of oil of win B) Phenyl salicylate D) Amino salicylic a)
31.	Total yield in mitocho A) 25 ATP	ndrial breakdown of B) 28 ATP	oyruvate per glucose C) 30 ATP	molecule is D) 36 ATP
32.	Zellweger's syndrom A) β-oxidation C) ω-oxidation	e is caused by	B) α-oxidationD) Both B) and C)	
33.	Which of the following A) Rotenone	g is the inhibitor of co B) Antimycin A	mplex III ? C) Amytal	D) Pteridicin A

34.	Match the following : 1. Southern blotting 2. Western blotting 3. Northern blotting 4. DNA fingerprinting A) $1 - A$, $2 - C$, $3 - C$ C) $1 - B$, $2 - A$, $3 - C$), 4 — В	A. Alwine B. E. M. S C. A. Jeffro D. Towbin	ey B)	nern 1 – B, 2 – D, 3 – 1 – B, 2 – C, 3 –	,
35.	The lipoprotein posse A) HDL	essing the B) LDL	highest qua		y of phospholipid VLDL	D) Chylomicrons
36.	To avoid ketosis, the sum of carbohydrate		• •) mı	ist not exceed wh	ich of the following
	A) C + P	B) 2C +		C)	2C + 1/2P	D) C + 2P
37.	Fischer's lock and ke A) Inactivation due to C) Competitive inhibi	denatura	•	B)	Allosteric modula Saturation kinetic	
38.	Which of the following A) Mevalonate \rightarrow Iso B) Mevalonate \rightarrow Sq C) Mevalonate \rightarrow Iso D) Mevalonate \rightarrow La	prenoid u ualene \rightarrow prenoid u	nits \rightarrow Squa Isoprenoid nits \rightarrow Lanc	alen unit ostei	e ightarrow Lanosterol s ightarrow Lanosterol rol ightarrow Squalene	sis ?
39.	Find out the mismatchA) Cysteine-β-mercaC) Ornithine-cadaver	pto ethano		B)	d its correspondin Glutamic acid-γ-a Histidine-Histami	mino butyric acid
40.	A one year old female are both low for her administration of whi symptoms ?	age. Her i	urine contai	ns a	an elevated level	of orotic acid. The
	A) Thymidine	B) Uridin	ie	C)	Guanine	D) Adenine
41.	Which immunoglobul			ype	rsensitivity reactio	ns and defend the
	body from helminthic A) IgG	B) IgA	?	C)	lgD	D) IgE
42.	The resolving power A) Electrons C) Power	of TEM is	derived fror	B)	Specimens Ocular system	
Α			-6	-		

- 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 mg/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 o effect in lowering pla	•	etary components w	vould have the greatest	
	A) Cholesterol		 B) Saturated fat 	t	
	C) Polyunsaturated	fat	D) Carbohydrate	e	
45.	Pulse field gel elect	rophoresis separates	DNA molecule of s	size	
	A) 10-20 bp	B) 20-30 kb	C) 30-50 kb	D) 40-50 bp	
46.	Amino sugars (Hexo	samines) are not the c	constituents of which	n one of the following ?	
	A) Hyaluronic acid		B) Chondroitin S	Sulphate	
	C) Erythromycin an	d carbomycin	D) Streptomycir	1	
47.	Diphtheria toxin inhi	bits translation by bic	ling with		
	A) eIF-2		B) 40 S subunit of ribosome		
	C) eEF-2 D) 60			of ribosome	
48.	8. An enzyme of purine metabolism associated with immunodeficiency disease				
	A) Adenosine deaminase		B) Xanthine oxidase		
	C) PRPP synthetas	e	D) HGPRT		
49.	Ketone bodies are r	not utilized or oxidized	d in which one of th	e following tissues ?	

A) Heart B) Brain C) Liver D) Muscles

- 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
 - C) Cholesterol
- B) Phospholipids
- D) Prostaglandins
- 51. A tRNA molecule that is supposed to carry cysteine (tRNA^{cys}) is mischarged, so that it actually carries alanine (ala-tRNA^{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) $30S \rightarrow mRNA \rightarrow f-Met-tRNA_f \rightarrow 50S$ B) $50S \rightarrow mRNA \rightarrow f-Met-tRNA_f \rightarrow 30S$
 - C) $50S \rightarrow f$ -Met-tRNA_f $\rightarrow mRNA \rightarrow 30S$ D) $30S \rightarrow f$ -Met-tRNA_f $\rightarrow mRNA \rightarrow 50S$
- 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

 $A + B + FAD + H_2O \longrightarrow C + FADH_2 + NADH$

Reactant A	Reactant B	Reactant C
A) Succinyl CoA	GDP	Succinate
B) Succinate	NAD+	Oxaloacetate
C) Fumarate	NAD+	Oxaloacetate
D) Succinate	NAD+	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 → Ferritin of intestinal mucosal cells → Absorption from Intestine
 - B) Ferritin of intestinal mucosal cells → Absorption from intestine → 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 ?
- Retina
 Thermogram
 Keystroke dynamics
 A) 1 and 3 only
 B) 1, 2 and 3
 C) 2 and 3 only
 D) 1 and 2 only
 G3. Which of the following are useful to determine location of a given mobile device ?
 Time Difference of Arrival
 Time of Arrival
 Enhanced Observed Time Difference
 - A) 1, 2 and 3 B) 1 and 2 only C) 1 and 3 only D) 2 and 3 only

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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 known as	g firearm with a combin	atio	n of smooth and rif	led barrels is better
	A) Vierling		,	Drilling	
	C) Machine gun		D)	Sub-machine gui	ו
66.	The most common c	alibre of tear-gas amm	nuni	tion encountered	is
	A) 6 mm	B) 8 mm	C)	9 mm	D) 12 mm
67.	Velocity of recoil of a 300 metre/second is A) 1 metre/second C) 6 metre/second	gun weighing 3 kilogr	B)	s firing a 100 gran 3 metre/second 9 metre/second	n bullet at
68.	 Which of the following from fire debris ? 1. ASTM E1386-00 2. ASTM E1412-00 3. ASTM E1413-00 4. ASTM E2388-00 A) 1, 2 and 4 only C) 1, 2 and 3 only 	g ASTM standards are	B)	2, 3 and 4 only 1, 3 and 4 only	table liquid residue
69.	 The common shapes 1. Spherical 2. Cubic 3. Rectangular 4. Needle-shaped A) 1, 2 and 3 only C) 1, 3 and 4 only 	s of crystalline pigmen	B)	re 1, 2 and 4 only 2, 3 and 4 only	

- A) 1 and 2 only B) 2 and 3 only C) 3 and 1 only D) 4 and 2 only
- 71. Abnormal situations of hair growth where excessive growth of hair take place are 1. Hirsutism

70. Which of the following ASTM guidelines are for examination of Portland cement

2. Alopecia

clinker?

1. ASTM C114-18 2. ASTM C1356-07 3. ASTM C1365-18 4. ASTM C1872-18e2

- 3. Hypertrichosis
- 4. Hypotrichosis
- A) 1 and 2 only
- B) 2 and 3 only C) 3 and 1 only D) 4 and 1 only
- 72. 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
- 73. Perspective grid method of crime scene sketching is best utilized for
 - 1. Traffic accident case
 - 2. Indoor scene

C) 1 and 3 only

- 3. Dense forest type of scene
- A) 1 and 2 only
- B) 2 and 3 only D) 1, 2 and 3
- 74. Lakshadweep is under jurisdiction of which of the following CFSL?
 - A) CFSL, Kolkata B) CFSL, Hyderabad
 - C) CFSL, Pune D) CFSL, Bhopal
- 75. NICFS was renamed after the name of Lok Nayak Jayaprakash Narayan in the year A)

) 1976	B) 1983	C) 1991	D) 200
) 1970	D) 1903	0) 1991	D) 20

- 76. The appellate jurisdiction of the Supreme Court can be invoked by a certificate granted by the High Court concerned under Article
 - 1. 125
 - 2.132(1)
 - 3. 133(1)
 - 4. 134
 - A) 1, 2 and 3 B) 1, 3 and 4 C) 1, 2 and 4 D) 2, 3 and 4

- 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 ?
 - 1. No hemorrhage
 - 2. Cellular proliferation and infiltration
 - 3. Absence of spurting
 - 4. 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 μ 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 I List – I	List – I with List – II : List – II		
	a. Organochlorines			
	b. Pyrethroids	ii. Dimeton		
	c. Organophosphor			
	d. Carbamates	iv. Dieldrin		
		option from those give	n 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 following?	term associated with	spurious consumpt	ion of which of the
	A) Dhatura	B) Opium	C) Cocaine	D) Illicit liquor
85.		ng bending vibrations a nove either above or be		
	A) Rocking	B) Twisting	C) Scissoring	D) Wagging
86.	 Arrange the following 1. Separation of ion 2. Ionization 3. Measuring the ion 4. Atomization Choose the correct of A) 4, 2, 1, 3 C) 2, 1, 3, 4 	n current	or Atomic Mass Spec B) 2, 4, 1, 3 D) 1, 2, 3, 4	trometric Analysis.
87.	 Which of the followin Chromatography ? 1. Good stability and 2. Nonlinear response 3. Short response ti 4. Poor reliability Choose the correct of 	ise to solutes me	s of the ideal detecto	r for Gas

A) 1, 2 and 3 only B) 2, 3 and 4 only C) 1 and 3 only

D) 2 and 4 only

- 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

Choose the correct option from those given below :

- а b С d
- A) i iii iv ii
- B) iv ii i iii
- C) i ii iii iv ii
- i D) iv iii

List – II

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

- is based on the detection of antibody ? B) Lattes' crust method
- A) Absorption elution 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?

90. Which of the following methods for determination of blood group in dried bloodstain

- 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

- 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
- 95. Inability to write the correct words is better known as
 - A) Motor agraphia B) Amnesic agraphia
 - C) Agnostic agraphia
- 96. A document written entirely written and signed by the same person is better known as

D) Paragraphia

- A) Holograph B) Genuine document
- C) Pilcrow D) Recto document
- 97. 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
- 98. 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
- 99. "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
- 100. Under which of the following Section of Wildlife (Protection) Act, 1972, a wild animal shall be a Government property ?

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A) 23(2) B) 13 C) 54 D) 39(1)

Space for Rough Work