101/2018

Question Booklet Alpha Code	A	Question Booklet Serial Number	100081

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 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.

SEAL

1. In which Indian city selected by UNESCO as World Heritage Cities ?
   (A) Ahmadabad (B) Mumbai (C) Kolkata (D) Hyderabad

2. The largest river in India :
   (A) Yamuna (B) Brahmaputra (C) Ganga (D) Sindhu

3. The first Bullet Train Project of India connects :
   (A) Mumbai - Pune (B) Ahmadabad - Mumbai
   (C) Delhi - Patna (D) Delhi - Amritsar

4. Kerala State Law Reform Commission Chairman :
   (A) Dr. N.K. Jayakumar (B) Sasidharan Nair
   (C) Adv. M.K. Damodaran (D) Justice. K.T. Thomas

5. Azad Hind Fauj was founded by :
   (A) Ras Behari Bose (B) Subash Chandra Bose
   (C) Liaqat Ali (D) Maulana Azad

6. Who was regarded as the father of Indian unrest ?
   (A) Mahatma Gandhi (B) Subash Chandra Bose
   (C) Bal Gangadhar Tilak (D) Mohammed Ali Jinna

7. Who is the newly elected Chief Minister of Goa ?
   (A) Manohar Pareekar (B) Beeran Singh
   (C) Amareendar Singh (D) Trivendra Singh Ravath

8. Who is the author of the Book *'A Brief History of Time'* ?
   (A) Roger Penrose (B) Jawaharlal Nehru
   (C) Alan H Guth (D) Stephen Hawking

9. Which country gives citizenship to 'Sofia' Humanoid Robot ?
   (A) Japan (B) Saudi Arabia (C) Israel (D) Qatar

10. The heroin of Quit India Movement :
    (A) Sarojini Naidu (B) Beegam Hazrath Mahal
    (C) Aruna Asafali (D) Sujetha Kripalani

11. Who is the second vice-chairman of NITI Aayog ?
(A) Dr. Rajiv Kumar (B) Aravind Panagaria
(C) Dr. Bibek Debroy (D) Dr. Bimal Jalan

12. Who was the leader of Paik Rebellion of 1817 ?
(A) Rani Laksmibai (B) Bakshi Jagabandhu
(C) Asadulla Khan (D) Tantia Tope

13. *"Katora Kudaram"* a notable work of :
(A) Vaikom Muhammad Basheer (B) Dr. C.K. Kareem
(C) Makthi Thangal (D) Ali Musliar

14. The leader of Ezhava Memorial of 1896 :
(A) Ayyankali (B) Dr. Vasudev
(C) K. Kelappan (D) Dr. Palpu

15. The King who proclaimed Temple entry ?
(A) Ayillyam Thirunnal (B) Swathi Thirunnal
(C) Sremulam Thirunnal (D) Sree Chithira Thirunnal

16. *The Swach Bharath Abhiyan* announced the cleanest city in India in 2017 is :
(A) Indore (B) Mysore (C) Mumbai (D) Chandigarh

17. Who bagged the Ezhuthachan award of the year 2017 ?
(A) Sukathakumari (B) K. Sachidanandan
(C) T.D. Ramakrishnan (D) K.R. Meera

18. The Founder of *"Sadhu Jana Paripalana Yogam"* :
(A) Sree Narayana Guru (B) Vakkom Abdul Khader Moulavi
(C) Ayyankali (D) Sahodaran Ayyappan

19. The first Governor of Reserve Bank of India :
(A) James Braid Taylor (B) Dr. Manmohan Singh
(C) Bimal Jalan (D) Osborne Smith

20. Who is the Minister for Sports in Kerala ?
(A) A.C. Moideen (B) K.T. Jaleel
(C) A.K. Balan (D) T.P. Ramakrishnan

SEAL

21. N - Acetyl galactosamine sulphate is present in :
(A) Hyaluronic acid (B) Heparin
(C) Chondroitin sulphate (D) None of the above

22. Respiratory distress syndrome occurs due to deficiency of :
(A) Plasmalogen (B) Spingomyelin
(C) Diphosphatidyl serine (D) Dipalmitoyl lecithin

23. Some of the calcium phosphate of blood is held in colloidal suspension by the protective action of :
(A) Carbohydrate (B) Lipids
(C) Proteins (D) Minerals

24. If the pH of blood is 7.4, the ratio of $NaHCO_3/H_2CO_3$ will be :
(A) 5 : 1 (B) 10 : 1 (C) 25 : 1 (D) 20 : 1

25. When eggs are cooked :
(A) Biotin is destroyed but avidin remains unaffected
(B) Avidin is inactivated but biotin remains unaffected
(C) Both avidin and biotin are inactivated
(D) Both avidin and biotin remain unaffected

26. Bacterial genomes is prevented by its own endonucleases by :
(A) Methylation at restriction sites
(B) Immune mechanism
(C) Nuclease resistant genome
(D) Are not much effective on bacterial genome

27. The difference which distinguish prokaryotic cell from eukaryotic is :
(A) Endoplasmic reticulum (B) Mesosome
(C) Plasma membrane (D) Nuclear membrane

28. The DNA molecule to which the gene of interest is integrated for cloning is called :
(A) Carrier (B) Transformer
(C) Vector (D) None of the above

29. HIV is the causative agent of AIDS and is a member of the Lentivirus genus of the family Retroviridae. Which of the following features of HIV makes it different from other members of this family ?
(A) HIV virus uses reverse transcriptase to convert its RNA genome into cDNA
(B) HIV infects human cells that are CD4 +
(C) HIV is enveloped
(D) The genomic RNA of HIV is 5' capped and 3' polyadenylated

30. Which cellular organelles are involved in the initiation of the intrinsic pathway of apoptosis ?
(A) Lysosome (B) Mitochondria
(C) Endoplasmic reticulum (D) Peroxisome

31. Which would be best to separate a protein that binds strongly to its substrate ?
(A) Gel filtration (B) Affinity chromatography
(C) Cation exchange (D) Anion exchange

32. Which of the following is not an IR vibrational mode ?
(A) Stretching (B) Scissoring (C) Rocking (D) Rolling

33. In rocket immunodiffusion, the length of the rocket is :
(A) Proportional to the amount of antibody placed in each well
(B) Inversely proportional to the amount of antibody placed in each well
(C) Inversely proportional to the amount of antigen placed in each well
(D) Proportional to the amount of antigen placed in each well

34. The following techniques provides method for locating H - atom in a protein structure :
(A) X - ray crystallography (B) NMR studies
(C) ESR spectroscopy (D) Circular dichroism

35. In mass spectrometer, the ions are sorted out in which of the following ways ?
(A) By accelerating them through electric field
(B) By accelerating them through magnetic field
(C) By accelerating them through electric and magnetic field
(D) By applying high voltage

36. The X - ray diffraction studies conducted by _____ were key to the discovery of the structure of DNA.
(A) Mc Clintok (B) Frankin
(C) Meselson and Stahl (D) Chargaff

37. Enzymes which are always present in an organism are known as :
(A) Inducible enzymes (B) Constitutive enzymes
(C) Functional enzymes (D) Apoenzymes

38. Enzymes which catalyze binding of two substrate by covalent bonds known as :
(A) Lyases (B) Hydrolases (C) Ligases (D) Oxidoreductases

39. The enzyme used to treat myocardial infarction is :
(A) Streptokinase (B) LDH (C) Creatine kinase (D) Lysozyme

40. The enzyme used in the food industry to flavour cheese production ?
(A) Amylase (B) Protease (C) Lipase (D) Catalase

41. Which one of the following is not protein ?
(A) DNase (B) Abzyme (C) Eco R1 (D) Ribozyme

42. The phosphate oxygen (P:O) ratio is defined as :
(A) The moles of phosphate consumed divided by moles of oxygen consumed
(B) The moles of ATP produced divided by the milligrams of protein
(C) The moles of CO_2 produced divided by moles of O_2 consumed
(D) The moles of ATP synthesized divided by the atom equivalents of O_2 consumed

43. Inherited deficiency of β glucosidase causes :
(A) Tay - Sach's disease (B) Meta chromatic leukodystrophy
(C) Gaucher's disease (D) Multiple sclerosis

44. In glyoxylate cycle :
(A) Fat is converted into carbohydrate
(B) Acetyl CoA is converted into carbohydrate
(C) Oxalic acid is converted into carbohydrate
(D) Fatty acid is converted into carbohydrate

45. Ammonia is oxidized to nitrite by :
(A) Nitrobacter (B) Nitrosomonas
(C) Bacillus denitrificans (D) Azotobacter

46. Esterification of cholesterol in plasma is catalyzed by :
(A) Lecithin : Cholesterol acyl transferase
(B) Acyl CoA : Cholesterol acyl transferase
(C) Succinyl CoA : Cholesterol acyl transferase
(D) Malonyl CoA : Cholesterol acyl transferase

47. A drug which prevents uric acid synthesis by inhibiting the enzyme Xanthine oxidase :
(A) Rifampsine (B) Aspirin (C) Allopurinol (D) Digitonin

48. Which is considered the gold standard of existing vaccines ?
(A) Purified proteins (B) Whole organism
(C) Inactivated exotoxins (D) Capsular polysaccharides

49. Which one is a metabolic data base ?
(A) KEGG (B) OMIM (C) PDB (D) PIR

50. Sterilization is done by autoclave that consists of exposure to steam at about :
(A) 120°C (B) 170°C (C) 121°C (D) 116°C

51. In protein ligand docking _____ ligand are often _____ in adopting a shape to fit the receptor binding cocket.
(A) Small molecule and highly flexible
(B) Large molecule and highly flexible
(C) Large molecule and more flexible
(D) Small molecule and less flexible

52. Correlation coefficient between x and y lies in the interval :
(A) [0, 1] (B) [−1, 0] (C) [1, 00] (D) [−1, 1]

53. Find the empirical relation between the mean, median and mode :
(A) Mode − 3 median − 2 mean (B) Median = 3 mean − 2 mode
(C) Mode − 2 median 3 mean (D) Mean = 3 median − 2 mode

54. Which of the following spectrometer techniques is the sample introduces as a solution which is neubilized under an applied electrical potential ?
(A) Fast atom bombardment (B) Electrospray ionization
(C) Electron ionization (D) Matrix assisted laser desorption ionization

55. Which of the following should be in position to split the effluent ?
(A) Interface (B) Ion source
(C) Make up gas (D) Microbore

56. The drug delivery systems with the longest duration of action is :
(A) Buccal preparations (B) Depot injections
(C) Implants (D) Transdermal patches

57. The term nanotechnology was coined by :
(A) Sumio Tijima (B) Richard Feynmann
(C) Richard Smalley (D) Eric Drexler

58. Which of the following is the most commonly used interface ?
(A) Chopper (B) Nebulizer
(C) Filter (D) Vapourizing chamber

59. Which of the following statement regarding epigenetic inheritance is false ?
(A) Epigenetic inheritance can be reset during gametogenesis
(B) Epigenetic inheritance can temporarily affect an individual
(C) Epigenetic inheritance does not involve a change in DNA sequence
(D) None of the above

60. Xeroderma pigmentosum results from a defect in :
(A) Exonuclease that removes pyrimidine dimers
(B) DNA polymerase β
(C) DNA ligase
(D) Any of the above

61. The number of degrees of freedom at the triple point of water system is :
(A) 1 (B) 2 (C) 3 (D) 0

62. Transport property associated with diffusion is :
(A) Concentration (B) Velocity (C) Momentum (D) Pressure

63. Which of the following is true if the wave function $\psi(x)$ is normalized ?
(A) $\psi^*(x)\,\psi(x) = 0$ (B) $\int_{-\alpha}^{+\alpha} \psi^*(x)\,\psi(x)\,dx = 1$
(C) $\int_{-\alpha}^{+\alpha} \psi^*(x)\,\psi(x) = 0$ (D) $\psi^*(x)\,\psi(x) = 1$

64. Charge carriers in conducting polymers are :
(A) Free electrons (B) Polarons
(C) Solitons (D) Both (B) and (C)

65. Inversion temperature is the temperature :
(A) at which Joule-Thomson coefficient changes its sign.
(B) above which a liquid cannot be liquified.
(C) at which a real gas behaves ideally.
(D) at which two enantiomers interchange their rotation.

66. The clausius inequality is given by :
(A) $ds \neq \frac{dq}{T}$ (B) $ds \geq \frac{dq}{T}$ (C) $ds \leq \frac{dq}{T}$ (D) $\frac{ds}{dT} \geq 0$

67. Variation of chemical potential with pressure and temperature can be given as :
(A) $\left(\frac{\partial \mu}{\partial P}\right)_T = V_m$ and $\left(\frac{\partial \mu}{\partial T}\right)_P = -S_m$
(B) $\left(\frac{\partial \mu}{\partial P}\right)_T = -V_m$ and $\left(\frac{\partial \mu}{\partial T}\right)_P = S_m$
(C) $\left(\frac{\partial \mu}{\partial P}\right)_T = -G$ and $\left(\frac{\partial \mu}{\partial T}\right)_P = -S_m$
(D) $\left(\frac{\partial \mu}{\partial P}\right)_S = -G$ and $\left(\frac{\partial \mu}{\partial T}\right)_P = S_m$

68. In cyclic voltammogram :
(A) current is monitored as a function of charge.
(B) current is monitored as a function of potential.
(C) potential is monitored as a function of time.
(D) current is monitored as a function of time.

69. Bosons have :
(A) Integral spins (B) Half integral spins
(C) Spins always equal to zero (D) Spins always equal to ½

70. First Nobel Prize in chemistry was awarded to :
(A) Arrhenius (B) Grignard (C) Van't Hoff (D) Ostwald

71. Fermi energy level of an intrinsic semiconductor lies :
(A) Close to the conduction band
(B) Close to the valence band
(C) Intrinsic semiconductors have no fermi levels
(D) At the middle of the band gap

72. Which of the following statements is **incorrect** ?
(A) Metal excess defects due to anion vacancies can generate F-centers.
(B) Phonons refers to quantum of energy absorbed or emitted by a crystal.
(C) Absorption of phonons by crystals can produce atomic imperfections and displacements.
(D) Total energy of a phonon is usually higher than that of an electron.

73. For a non - linear activated complex, the number of vibrational degrees of freedom is :
(A) 3N (B) 3N + 5 (C) 3N − 6 (D) 3N − 7

74. The molecule active in rotational microwave, infrared as well as rotational - Raman is :
(A) HCl (B) CO_2 (C) SF_6 (D) O_2

75. Which of the following is used to express the dose in dosimetry ?
(A) Exposure (B) Absorbed dose
(C) Equivalent dose (D) All the above

76. Half life of a zero order reaction is :
(A) $\frac{[A_0]}{k}$ (B) $\frac{k}{[A_0]}$ (C) $\frac{[A_0]}{2k}$ (D) $\frac{2k}{[A_0]}$

77. Binding energy per nuclear of $_2He^4$ nucleus is :
(A) 8.2 MeV (B) 7.1 MeV (C) 6.5 MeV (D) 8.9 MeV

78. Reaction of phenol with chloroform in presence of sodium hydroxide to introduce aldehydic group in the benzene ring is :
(A) Kolbe's reaction (B) Reimer - Tiemann reaction
(C) Williamson's synthesis (D) Wilkinson's synthesis

79. Monomer of Nylon 6, 6 is :
(A) Caprolacton
(B) Caprolacton and hexamethylene diamine
(C) Adipic acid and hexamethylene diamine
(D) Acrylonitrile and adipic acid

80. Pyramidine base present in DNA are :
(A) Adenine and Thyamine (B) Guanine and Thyamine
(C) Cytocine and Guanine (D) Cytocine and Thyamine

81. Ribose is a :
(A) Aldopentose sugar
(B) Aldohexose sugar
(C) Ketopentose sugar
(D) Ketohexose sugar

82. Which of the following is less reactive ?
(A) Haloalkanes
(B) Haloarenes
(C) Haloalkenes
(D) Haloalkynes

83. When acyl chlorides react with alcohols and phenoles we get :
(A) Esters (B) Ketones (C) Aldehydes (D) Acetyl alcohols

84. Lactose on hydrolysis produces :
(A) β – D – Galactose and β – D – Glucose
(B) α – D – Galactose and D – (–) – Fructose
(C) α – D + Glucose and α + D – Galactose
(D) D – (+) Glucose and β – D – Galactose

85. When 1-methyl cyclohexene is reacted with hydrogen Iodide, the major product formed is :
(A) 1-iodo 1-methyl cyclohexane
(B) 2-iodo 1-methyl cyclohexane
(C) Both the above products are formed to an equal extent
(D) Hydrogen Iodide will not react with cyclohexane

86. Which of the following statements is **wrong** ?
(A) Starch contain amylose and amylopectin
(B) Amylopectin is made up of D(+) glucose units
(C) C – O – C bond between the rings of polysaccharide molecules is called glycoside linkage
(D) Amylose is a highly branched polymer of α-glucose where as amylopectin is a straight chain polymer

87. pH of a solution containing 0.25 M ammonia and 0.4 M ammonium chloride solution is (given that K_b for NH_3 is 1.8×10^{-5}) :
(A) 8.70 (B) 9.05 (C) 9.6 (D) 9.95

88. The geometry of PCl_4^+ ion is :
(A) trigonal bipyramid
(B) planar trigonal
(C) tetrahedral
(D) square planar

89. In IR spectra, the benzene C=C bond vibrations occur around :
(A) 1300 cm^{-1} and 1400 cm^{-1} (B) 1500 cm^{-1} and 1600 cm^{-1}
(C) 1700 cm^{-1} and 1800 cm^{-1} (D) 2900 cm^{-1} and 3000 cm^{-1}

90. In polarography the current observed in absence of an electroactive species is :
(A) Limiting current (B) Diffusion current
(C) Residual current (D) Half wave current

91. In UV spectroscopy, the $n \rightarrow \pi^*$ transition is characteristic of :
(A) Unsaturated carbonyl compounds
(B) Aromatic hydrocarbons
(C) Non conjugated polyenes
(D) All the above

92. Which of the following statements regarding H^1nmr spectra is **true** ?
(A) Arene C – H signals are always singlets.
(B) Arene C – H signals are always multiplets.
(C) Arene C – H chemical shifts values are greater than simple alkane C – H chemical shift values because of aromatic ring current.
(D) Arene C – H chemical shift values are smaller than simple alkane C – H chemical shift values because of aromatic ring current.

93. Karl Fischer titration is used to determine :
(A) Concentration of Cl_2 in a water sample
(B) pH of an aqueous solution
(C) Alcohol content in a water sample
(D) The water content of the sample

94. In reversed phase HPLC :
(A) a hydrophilic stationary phase is combined with a non polar mobile phase
(B) a hydrophobic stationary phase is combined with a polar mobile phase
(C) a hydrophilic stationary phase is combined with a polar mobile phase
(D) a hydrophobic stationary phase is combined with a non polar mobile phase

95. Langmuir adsorption isotherm at high pressure can be represented as :
(A) $\frac{x}{m} = \frac{a}{b}$ (B) $\frac{x}{m} = \frac{ab}{1 + bp}$ (C) $\frac{x}{m} = ap$ (D) $\frac{x}{m} = \frac{1 + b}{a}$

96. The correct order of coagulating ions for the coagulation of colloidal Ferric hydroxide is :

(A) $Cl^- > SO_4^{2-} > PO_4^{3-}$ (B) $PO_4^{3-} > SO_4^{2-} > Cl^-$

(C) $Al^{3+} > Mg^{2+} > Na^+$ (D) $Na^+ > Mg^{2+} > Al^{3+}$

97. A potential of -0.822 V was applied to a cell potential of -0.734 V. The internal resistance of the cell was 20.0 Ω and an initial current of 1.80 mA was measured. The over potential for this cell is :

(A) 0.076 V (B) 0.042 V (C) 0.062 V (D) 0.018 V

98. The titrant used in the diazotization method employed to assay sulpha drugs is :

(A) Potassium Nitrate (B) Silver Nitrite

(C) Sodium Nitrate (D) Sodium Nitrite

99. The initial step in the experimental procedure for mass spectrometry is :

(A) bombardment of sample by electron beam

(B) converting the sample into gaseous state

(C) separating the ions by passing them through electric and magnetic field

(D) splitting of the ions

100. Internal energy in terms of partition function (Q) can be given as :

(A) $E = -kT^2 \ln Q$ (B) $E = -kT \ln Q$

(C) $E = kT^2\left(\frac{\partial \ln Q}{\partial T}\right)_V$ (D) $E = kT^2\left(\frac{\partial \ln Q}{\partial V}\right)_T . V$

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