

LIFE SCIENCES

Name & Signature of the Invigilator

PAPER-II OMR Answer Sheet No. :

SEPT-18/04

Roll No. :

(in figures as in Hall Ticket)

Roll Number in words :

Time : 2 Hours]

No. of Printed Pages : 26

[Maximum Marks : 200

Instructions for the Candidates

- Write your Roll Number in the space provided on the top of this page.
- This paper consists of one hundred (100) multiple choice type of questions. All questions are compulsory.
- At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below :
 - To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker seal and do not accept an open booklet.
 - Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.
 - After this verification is over, the Test Booklet Number should be entered on the OMR Answer Sheet and the OMR Answer Sheet Number should be entered on this Test Booklet.
- Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the oval as indicated below on the correct response against each item.
Example : (A) (B) (C) (D) where (B) is the correct response.
- Your responses to the items are to be indicated on the OMR Answer Sheet under Paper - II only. If you mark your response at any place other than in the oval in the OMR Answer Sheet, it will not be evaluated.
- Read instructions given inside carefully.
- Rough Work is to be done in the end of this booklet.
- If you write your Name, Roll Number, Phone Number or put any mark on any part of the OMR Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, such as change of response by scratching or using white fluid, you will render yourself liable to disqualification.
- You have to return the original OMR Answer Sheet to the invigilator at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are however, allowed to carry original question booklet and duplicate copy of OMR Answer Sheet on conclusion of examination.
- Use only Blue/Black Ball point pen.
- Use of any calculator or any electronic devices or log table etc., are prohibited.
- There shall be no negative marking.
- In case of any discrepancy in the English and Gujarati versions of questions, English version will be taken as final.

પરીક્ષાની શરૂઆતમાં આપને પ્રશ્નપુસ્તિકા આપવામાં આવશે. પ્રથમ પાંચ (૫) મિનિટ દરમિયાન તમારે પ્રશ્નપુસ્તિકા ખોલી અને ફરજિયાત પસંદગી મુજબ પરીક્ષણ કરવું :

- આ પાનાની ટોચ પર દર્શાવેલી જગ્યામાં તમારો રોલ નંબર લખો.
- આ પ્રશ્નપત્રમાં બહુવિકલ્પિક ઉત્તરો ધરાવતા સો (૧૦૦) પ્રશ્નો આપેલા છે. બધા જ પ્રશ્નો ફરજિયાત છે.
- પરીક્ષાની શરૂઆતમાં આપને પ્રશ્નપુસ્તિકા આપવામાં આવશે. પ્રથમ પાંચ (૫) મિનિટ દરમિયાન તમારે પ્રશ્નપુસ્તિકા ખોલી અને ફરજિયાત પસંદગી મુજબ પરીક્ષણ કરવું :
 - પ્રશ્નપુસ્તિકાનો વપરાશ કરવા માટે આ કવર પૃષ્ઠની ઘાર પર આપેલ સીલ સ્ટીકર ફાડી નાખો. કોઈપણ સંજોગોમાં સીલ સ્ટીકર વગર નીચે મુજબ પ્રશ્નપુસ્તિકા સ્વીકારશો નહીં.
 - કવર પૃષ્ઠ પર છપાયેલ નિર્દેશાનુસાર પ્રશ્નપુસ્તિકાના પ્રશ્નો, પૃષ્ઠો અને સંખ્યાને બરાબર ચકાસી લો. ખામીયુક્ત પ્રશ્નપુસ્તિકા કે જેમાં પ્રશ્નો/પૃષ્ઠો ઓછાં હોય, બે વાર છપાયા હોય, અનુક્રમમાં અથવા અન્ય કોઈ ફરક હોય અર્થાત કોઈપણ સંજોગોમાં ખામીયુક્ત પ્રશ્નપુસ્તિકા સ્વીકારશો નહીં. અને જો ખામીયુક્ત પ્રશ્નપુસ્તિકા મળી હોય તો નિરીક્ષક પાસેથી તુરંત જ બીજી સારી પ્રશ્નપુસ્તિકા મેળવી લેવી. આ માટે ઉમેદવારને પાંચ (૫) મિનિટનો સમયગાળો આપવામાં આવશે. પછીથી, પ્રશ્નપુસ્તિકા બદલવામાં આવશે નહીં કે કોઈ વધારાનો સમયગાળો આપવામાં આવશે નહીં.
 - આ ચકાસણી સમાપ્ત થાય પછી, પ્રશ્નપુસ્તિકાનો નંબર OMR જવાબ પત્રક પર લખવો અને OMR જવાબ પત્રકનો નંબર પ્રશ્નપુસ્તિકા પર લખવો.
- પ્રત્યેક પ્રશ્ન માટે ચાર જવાબ વિકલ્પ (A), (B), (C) અને (D) આપવામાં આવેલ છે. તમારે સાચા જવાબના ઓવલ (oval) ને નીચે આપેલ ઉદાહરણ મુજબ પેનથી ભરીને સંપૂર્ણ કરવાનું રહેશે.
ઉદાહરણ : (A) (B) (C) (D) કે જ્યાં (B) સાચો જવાબ છે.
- આ પ્રશ્નપુસ્તિકાના પ્રશ્નો ના જવાબ અલગથી આપવામાં આવેલ OMR જવાબ પત્રકમાં પેપર-II લખેલ વિભાગમાં જ અંકિત કરવા. જો આપ OMR જવાબ પત્રકમાં આપેલ ઓવલ (oval) સિવાય અન્ય સ્થાને જવાબ અંકિત કરશો તો તે જવાબનું મૂલ્યાંકન કરવામાં આવશે નહીં.
- અંદર આપેલ સૂચનાઓ ધ્યાનપૂર્વક વાંચો.
- કાંચું કામ (Rough Work) પ્રશ્નપુસ્તિકાના અંતિમ પૃષ્ઠ પર કરવું.
- જો આપ OMR જવાબ પત્રક નિયત જગ્યા સિવાય અન્ય કોઈપણ સ્થાને, આપનું નામ, રોલ નંબર, ફોન નંબર અથવા એવું કોઈ ચિહ્ન કે જેનાથી તમારી ઓળખ થઈ શકે, અંકિત કરશો અથવા અભદ્ર ભાષાનો પ્રયોગ કરો, અથવા અન્ય કોઈ અનુચિત સાધનોનો ઉપયોગ કરો, જેમ કે અંકિત કરી દીધેલ જવાબ ભૂંસી નાખવો કે સફેદ શાલીનો ઉપયોગ કરી બદલશો તો આપને પરીક્ષા માટે અયોગ્ય જાહેર થઈ શકો છો.
- પરીક્ષા સમય પૂરો થઈ ગયા બાદ ઓરીજનલ OMR જવાબ પત્રક જે તે નિરીક્ષકને ફરજિયાત સોંપી દેવું અને કોઈ પણ સંજોગોમાં તે પરીક્ષાખંડની બહાર લઈ જવું નહીં. પરીક્ષા પૂર્ણ થયા બાદ ઉમેદવાર ઓરીજનલ પ્રશ્નપુસ્તિકા અને OMR જવાબ પત્રકની ડુપ્લિકેટ કોપી પોતાની સાથે લઈ જઈ શકે છે.
- માત્ર કાચી/ભૂરી બોલ પોઈન્ટ પેન વાપરવી.
- કેલ્ક્યુલેટર, લોગ ટેબલ અને અન્ય ઈલેક્ટ્રોનિક યંત્રોનો ઉપયોગ કરવાની મનાઈ છે.
- ખોટા જવાબ માટે નકારાત્મક ગુણાંકન પ્રથા નથી.
- પ્રશ્નપુસ્તિકાના કોઈ પ્રશ્નમાં અનુવાદ અંગે કોઈ વિવાદ/મતભેદ જણાય તો અંગ્રેજી વર્ઝન યોગ્ય ગણાશે.

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Your Personal Exam Guide

LIFE SCIENCES**PAPER-II**

Note : This paper contains **One Hundred (100)** multiple-choice, matching questions, each question carrying **TWO (2)** marks. Attempt **All** the questions.

1. Which one of the following statements is *incorrect* with respect to the nature and properties of lipids ?
 - (A) Most natural unsaturated lipids are *cis* isomers.
 - (B) *n*-3 and *n*-6 denotations of unsaturated fatty acids are based on the last double bonded carbon from the methyl terminal.
 - (C) *n*-3 and *n*-6 denotations of unsaturated fatty acids are based on the last double bonded carbon from the Carboxyl terminal.
 - (D) Lipid fluidity is different for *cis* and *trans* forms of lipids.
2. How many fragments of a linear DNA of 1 kb size are obtained upon treating with a restriction enzyme having a recognition sequence 5'-TCGA-3' ?
 - (A) 4
 - (B) 10
 - (C) 12
 - (D) 20
3. Which one of the following is a phagemid vector ?
 - (A) pUC19
 - (B) pBR322
 - (C) λ EMBL3
 - (D) pBluescript KS
4. How much is the approximate propeller twist in B-form of DNA ?
 - (A) 30°
 - (B) -30°
 - (C) 36°
 - (D) -36°
5. Which one of the following enzymes can alter the linking number of covalently closed circular form of DNA ?
 - (A) Primase
 - (B) DNA polymerase
 - (C) Gyrase
 - (D) Helicase

6. Which one of the following is a *mismatch* ?
- (A) Late blight of Potato - *Phytophthora infestance*
 - (B) Red rot of sugarcane - *Colletotrichum falcatum*
 - (C) Tikka leaf spot of groundnut - *Cercospora personata*
 - (D) Angular leaf spot of cotton - *Albugo candida*
7. Polynucleotide kinase can be used for :
- (A) 3'-end labeling of DNA fragments
 - (B) 5'-end labeling of DNA fragments
 - (C) Phosphorylation of linkers prior to ligation
 - (D) Both (B) and (C)
8. The presence of F-factor in the bacterial cell indicates it as :
- (A) Male
 - (B) Female
 - (C) F⁺ Cell
 - (D) F⁻ Cell
9. Which one of the following chemical mutagens is incorporated into the genome by DNA polymerase during genome replication ?
- (A) Alkylating agent
 - (B) Base analogs
 - (C) Deaminating agents
 - (D) Intercalating agents
10. 'Cap' is a feature of which of the following nucleic acid molecules ?
- (A) Eukaryotic mRNA
 - (B) Eukaryotic rRNA
 - (C) Viral RNA
 - (D) Mitochondrial mRNA
11. RAPD marker is :
- (A) Recessive
 - (B) Co-dominant
 - (C) Dominant
 - (D) Partially dominant

12. Restriction endonucleases which recognize and cut at the same site of recognition sequences are known as :
- (A) Isoschizomers (B) Isozymes
(C) Neoschizomers (D) Isocaudomers
13. Which one of the following features is a *mismatch* repair ?
- (A) Modified nucleotides are recognized
(B) Cyclobutyl primers are removed
(C) Parent and daughter strands of newly replicated DNA are distinguished
(D) The correct reading frame is identified
14. Exon skipping is associated with :
- (A) a nonsense mutation (B) regulatory mutation
(C) silent mutation (D) RNA processing mutation
15. A segment of DNA has 30 adenine and 30 cytosine bases. The total number of nucleotides present in this segment is :
- (A) 15 (B) 30
(C) 60 (D) 120
16. A transcription unit is 8000 nucleotide long. If only 15% of this unit codes for protein, calculate the approximate molecular weight of the protein encoded.
- (A) 44kDa (B) 50kDa
(C) 120kDa (D) 300kDa
17. A purified dimer protein of 70kDa when ran on SDS-PAGE, give single band. What would be the size of the band ?
- (A) 70kDa
(B) 35kDa
(C) 45kDa
(D) depends upon acrylamide % in the gel

18. Which one of the following is (better) separation method for two polypeptides of identical molar mass ?
- (A) SDS-PAGE (B) Isoelectric focusing
(C) Acid degradation (D) Native PAGE
19. The K_{cat}/K_m is :
- (A) affinity constant (B) turnover constant
(C) efficiency constant (D) substrate constant
20. Abzymes are :
- (A) isozymes (B) oligomeric proteins
(C) non-protein catalysts (D) catalytic antibodies
21. Leaves of grasses can continue to elongate following mowing or grazing due to actively growing tissue at the base of leaf blade and sheath that is called :
- (A) apical meristem (B) basal meristem
(C) lateral meristem (D) intercalary meristem
22. Which one of the following is the *correct* sequence of events for running 2 D gel electrophoresis ?
- (A) SDS PAGE, IEF (B) Native PAGE, SDS PAGE
(C) IEF, SDS PAGE (D) SDS PAGE, Native PAGE
23. Which one of the following is TRUE for mycoplasma ?
- (A) They fail to grow on artificial media
(B) They resistant to streptomycin
(C) They stain well with Gram's stain
(D) They are resistant to penicillin

24. Which one of the following does *not* protect microbes grown under aerobic conditions from free radicals ?
- (A) Superoxide dismutase (B) Peroxidase
(C) Catalase (D) Hexokinase
25. Which one of the following is an obligate anaerobic fungus ?
- (A) *Neurospora* sp. (B) *Neocallimastix* sp.
(C) *Nectria* sp. (D) *Penicillium* sp.
26. Which one of the following is FALSE with respect to quorum quenching ?
- (A) Analogues of acyl-ACP and SAM
(B) Lactonolysing enzymes
(C) Garlic extract
(D) Flavonoid
27. Which one of the following statements about quiescent centre is *not true* ?
- (A) It occupies the central position of the root meristem.
(B) It is present in the apical as well as lateral meristem.
(C) It connects to all initial cells of the root meristem.
(D) It has most actively dividing cells in the root meristem.
28. Which one of the following is commonly used for identification of bacteria ?
- (A) 18S *r*DNA sequences (B) 16S *r*DNA sequences
(C) Insertion sequences (D) 23S *r*DNA sequences

29. Which one of the following represents the probable identity of 3 enteric bacteria (1, 2, 3) based on the results of standard biochemical tests ?

	Bacteria		
Test	1	2	3
Indole	+	—	—
Methyl Red	+	+	+/-
Voges-Proskauer	—	—	+

- (A) *Escherichia*, *Salmonella*, *Enterobacter*
 (B) *Enterobacter*, *Salmonella*, *Escherichia*
 (C) *Salmonella*, *Enterobacter*, *Escherichia*
 (D) *Escherichia*, *Enterobacter*, *Salmonella*
30. The following table shows the number of individuals of five fungal species in a community :

Fungal species	No. of individuals
1	50
2	20
3	20
4	05
5	05

Based on the above, the Simpson's Diversity Index of the community will be :

- (A) 0.345 (B) 0.435
 (C) 0.335 (D) 0.552

31. Morphological similarities amongst organisms with different genotypes indicate :
- (A) microevolution (B) macroevolution
(C) divergent evolution (D) convergent evolution
32. When the presence of secretory product of a species inhibits another species ?
- (A) Amensalism (B) Predation
(C) Parasitism (D) Commensalism
33. First life on earth was :
- (A) Photo-autotrophs (B) Chemoheterotrophs
(C) Cyanobacteria (D) Autotrophs
34. The process of product recovery from fermentation broth is called :
- (A) Upstream processing (B) Inoculation
(C) Elution (D) Downstream processing
35. In which one of the following tissues of wheat seed, alpha amylase gene is induced in response to GA ?
- (A) Embryo (B) Aleurone layer
(C) Coleoptile (D) Endosperm
36. Which one of the following biopesticides also acts as a biofungicide ?
- (A) *Metarrhizium anisopliae* (B) *Verticillium lecani*
(C) *Bacillus thuringiensis* (D) *Trichoderma harzianum*

37. The microbial products and their producers are listed below in two columns :

- | | |
|------------------|------------------------------------|
| (a) Vitamin B2 | (i) <i>Aspergillus terreus</i> |
| (b) Vitamin B12 | (ii) <i>Tolypocladium</i> sp |
| (c) Statin | (iii) <i>Propionibacterium</i> sp. |
| (d) Cyclosporine | (iv) <i>Ashbya gossypi</i> |

Which one of the following combinations of producers and product is the *correct* match ?

- (A) (a) – (iv), (b) – (iii), (c) – (i), (d) – (ii)
(B) (a) – (iii), (b) – (iv), (c) – (i), (d) – (ii)
(C) (a) – (iv), (b) – (i), (c) – (ii), (d) – (iii)
(D) (a) – (i), (b) – (ii), (c) – (iii), (d) – (iv)

38. Which one of the following does *not* involve biostimulation in bioremediation ?

- (A) *In-situ* stimulation of microbial growth
(B) Bioaugmentation with desired microbes
(C) Non-selective stimulation of microbial growth
(D) Addition of easily utilisable substrates

39. The mean for a binomial distribution of 10 samples having a probability of occurrence of 0.4 will be :

- (A) 4 (B) 8
(C) 16 (D) 40

40. Correlation coefficient tends to lie between :

- (A) -2 to +2 (B) -1 to +1
(C) -1 to Zero (D) Zero to +1

41. According to the classical genetics, which one of the following statements is true ?
- (A) Genes on different autosomes segregate independently
 - (B) Genes on sex chromosomes segregate with same pattern as autosome genes
 - (C) Recessive alleles are detected by the phenotype of the F_1 generation
 - (D) The closer the distance between the genes, higher is the frequency of recombination
42. Silent mutation in a gene results in :
- (A) an amino acid substitution that has a significant effect on the functional activity of the protein encoded by the gene.
 - (B) no expression of the protein encoded by the gene.
 - (C) no change in the amino acid sequence of the protein encoded by the gene.
 - (D) no change in the nucleotide sequence of the mRNA encoded by the gene.
43. Active transport differs from facilitated diffusion in that :
- (A) in active transport the molecules move from higher to lower concentration
 - (B) carrier protein is involved in both the transports
 - (C) energy is consumed to move molecules against a concentration gradient in active transport only
 - (D) in active transport only water molecules are transported
44. Microtubule-depolymerizing drug, such as colchicine, is expected to :
- (A) inhibit mitosis but allow cytokinesis
 - (B) inhibit cytokinesis
 - (C) allow mitosis beyond metaphase
 - (D) induce formation of multiple contractile rings

45. Neurons are formed from precursor cells in proneural region due to :
- (A) relatively low level of notch activity
 - (B) relatively high level of notch activity
 - (C) inactivation/knock-out of notch molecule
 - (D) over-activation/knock-in of delta molecule
46. In developing brain, Notch signalling :
- (A) promotes neuron formation
 - (B) promotes astrocyte formation and inhibits neuron formation
 - (C) inhibits stem cell to neural progenitor cell formation
 - (D) inhibits astrocyte formation
47. A neuron at resting state when treated with (X) showed transmembrane potential 50 mV, while when treated with (Y) showed -90 mV. Given such a condition, which of the following statements would be most appropriate ?
- (A) (X) induced depolarization, while (Y) induced hyperpolarization
 - (B) the threshold for inducing a response by the neuron was higher for (X) than that for (Y)
 - (C) both the treatments induced depolarization of the neuron
 - (D) both the treatments induced hyperpolarization of the neuron
48. Mark the *incorrect* function of the kidney. It is responsible for :
- (A) thermoregulation
 - (B) coordinated muscle movement
 - (C) blood pressure control
 - (D) maintaining ionic balance and pH of the blood

49. The C_4 plants are photosynthetically more efficient than C_3 plants because :
- (A) the CO_2 compensation point is high
 - (B) CO_2 generated during photorespiration is trapped and recycled through PEP carboxylase
 - (C) they have high density of chloroplasts
 - (D) atmospheric CO_2 is efficiently trapped in mesophyll cells
50. Neurons originate from :
- (A) mesoderm and ectoderm
 - (B) entoderm and mesoderm
 - (C) glia and entoderm
 - (D) ectoderm
51. Which one of the following statements is *incorrect* for the brain in higher animals ?
- (A) Glia are more in number than the neurons and they help in providing protection, growth and development of neurons.
 - (B) Glia are significantly fewer in number than the neurons, the latter help in the former's survival.
 - (C) Neurons are significantly fewer in number than the glia and the latter helps maintaining ionic homeostasis of neurons.
 - (D) Glia are significantly more in number than neurons, they help in making blood brain barrier but apparently do not appear to directly regulate the rate of propagation of action potential in neurons.
52. Progesterone :
- (A) is synthesized in the hypothalamic neurons and stored in posterior pituitary.
 - (B) plays a major role in preparing the uterus for implantation.
 - (C) is a protein hormone and solely responsible for the maintenance of secondary sex characteristics.
 - (D) is exclusively responsible for stimulation of FSH production and follicle growth.

53. Which one of the following statements regarding RBC is *correct* ?
- (A) Human and frog RBCs are biconcave.
 - (B) Nucleated in camel and enucleated in humans.
 - (C) Camel and frog RBCs are biconcave.
 - (D) Nucleated in humans and enucleated in camels.
54. Translocation of organic solutes in the sieve tube members is supported by :
- (A) root pressure
 - (B) carrier proteins and ATP
 - (C) cytoplasmic movements
 - (D) *p*-proteins
55. Which one of the following is known as the pacemaker of the heart ?
- (A) AV node
 - (B) Purkinje fibers
 - (C) Bundle of His
 - (D) SA node
56. Diaphragm helps in. :
- (A) filtration process while urine formation
 - (B) synthesis and secretion of hormones
 - (C) maintaining the intestinal coils/loops in place
 - (D) inspiration and expiration
57. Precursor of natural indoleacetic acid is :
- (A) Proline
 - (B) Methionine
 - (C) Tryptophan
 - (D) Phenylalanine

58. Which one of the following is *not* a function of an auxin ?
- (A) Maintenance of apical dominance
 - (B) Enhancement of cell division
 - (C) Induction of dormancy
 - (D) Inducing callus formation
59. Coiled cochlea is found in :
- (A) mammals
 - (B) mammals as well as in birds
 - (C) birds and reptiles
 - (D) all vertebrates without exception
60. Which one of the following types of neurons is predominantly lost in Alzheimer's disease ?
- (A) Cholinergic
 - (B) Serotonergic
 - (C) Noradrenergic
 - (D) Histaminergic
61. The lens in the human eye is :
- (A) biconcave
 - (B) biconvex
 - (C) concavo-convex
 - (D) planoconvex
62. Conduction of electrical signals in neurons depends on :
- (A) length and diameter of axons
 - (B) diameter of axons and number of dendrites
 - (C) myelination and diameter of axons
 - (D) myelination and length of axons

63. In plant tissue culture, keeping auxin amount constant and increase in cytokinin leads to :
- (A) root differentiation (B) shoot differentiation
(C) callus formation (D) somatic embryogenesis
64. Normally a dog did not salivate if it was shown red light but salivated when given a piece of meat. It was also observed that if the red light was shown every time before giving the piece of meat, the dog salivated. After a few such trials of showing light followed by giving a piece of meat, it was observed that the dog started salivating even if it was shown the red light alone, without giving piece of meat. Salivation upon showing the red light alone :
- (A) is an unconditioned response
(B) the red light acted as an unconditioned stimulus
(C) was because the light stimulated the taste buds
(D) is an example of conditioned response
65. A grazing antelope was killed by a leopard for food. It is an example of :
- (A) competition (B) interaction
(C) predation (D) mutualism
66. In extreme cold weather, the water in most of the lakes freezes. Which one of the following options is valid for the fish in those frozen lakes ?
- (A) Most of the fish die/complete their life cycle by the time the water freezes.
(B) Deeper water (near the bottom) of the lake does not freeze.
(C) Fish possesses a unique property like preserving cells in liquid nitrogen.
(D) Ice is a good conductor of heat.

67. Genetic dwarfism in plants can be nullified by spraying with :
- (A) Auxin (B) Cytokinin
(C) Gibberellins (D) Abscissic acid
68. What would you expect when a solution containing particles with similar density but varying sizes is centrifuged ?
- (A) heavier particles will move more rapidly away from the centre than the lighter ones.
(B) the force experienced depends only on the relative distance at which the particles are from the centre.
(C) lighter particles will move more rapidly away from the centre than the heavier ones.
(D) all particles will experience the same amount of force.
69. You are given two proteins "A" and "B", "A" was a homodimer, while "B" a homotetramer. They were dissolved separately and run on SDS PAGE. Both the gels gave clean single band at 100 KDa. The molecular weight of the proteins were :
- (A) A 200 KDa, while B 400 KDa
(B) A 400 KDa, while B 200 KDa
(C) A 100 KDa, while B 200 KDa
(D) A 100 KDa, while B 400 KDa

70. "M" is a naturally occurring physiological chemical which acts through a second messenger. Chemically, "X" and "Y" two new synthetic structural analogues of "M" were prepared. However, in a cell culture experiment it was observed that treatment of the cells with "X" in the medium mimicked the action of "M" but "Y" was significantly less effective. The most probable reason could be :
- (A) "X" and "Y" have different affinities for surface receptor of the cells
 - (B) "X" could enter the cells but "Y" could not
 - (C) "Y" could enter the cells but "X" could not
 - (D) analogues can never act as natural products
71. Florigen synthesis in plants is regulated by :
- (A) Cytokinin
 - (B) Gibberellins
 - (C) Ethylene
 - (D) Absciscic acid
72. In the process of sample preparation for R.B.C. and W.B.C. count by a hemocytometer :
- (A) the dilution of the sample for R.B.C. counting is significantly more because they do not possess nucleus.
 - (B) the dilution of the sample for W.B.C. counting is significantly more because they possess nucleus and have amoeboid movement.
 - (C) the dilution is significantly higher for R.B.C. counting and it is done to keep the corpuscles separated for accuracy in counting.
 - (D) the dilution for both the preparation is maintained constant to reduce non-specific error of counting.

73. Which of the following factor(s) is/are likely to affect the spectrophotometric readings ?
- (A) volume of the solution in the same cuvet (used for taking the reading)
 - (B) if the readings of the same solution taken in a 3 ml or a 0.5 ml cuvet
 - (C) concentration of the solution even if the volume in the cuvet varies but the light path remains constant
 - (D) if the readings of the same solution are taken at sea level and again at a height of 1523.32 meters (other conditions remaining constant)
74. Record of electrical signals from the scalp is known as :
- (A) Electroencephalogram (EEG)
 - (B) Electrocardiogram (ECG)
 - (C) Magnetoencephalogram (MEG)
 - (D) Magnetic Resonance Imaging (MRI)
75. Which one of the following is *not* applicable for a chemical synapse ?
- (A) Usually synaptic cleft is approx. 20 – 40 nm
 - (B) May release excitatory or inhibitory neurotransmitter
 - (C) Cannot modulate signal intensity
 - (D) There is a delay of signal propagation
76. Release of neurotransmitter from the presynaptic terminal depends on :
- (A) Na^+ influx
 - (B) K^+ efflux
 - (C) Ca^{++} influx
 - (D) Ca^{++} efflux

77. Which one of the following is the target protein/enzyme for the activation of tumors by phorbol esters ?
- (A) Phospholipase C (B) Protein Kinase A
(C) Protein Kinase C (D) Receptor G protein
78. During water stress, increase in abscisic acid level initially causes :
- (A) increased absorption of water by roots
(B) reduced transpiration
(C) opening of stomata
(D) closing of stomata
79. Puromycin inhibits which step of translation in protein synthesis ?
- (A) Transpeptidation (B) Elongation
(C) Initiation (D) Termination
80. Ethylene enhances the production of :
- (A) protease and amylase (B) amylase and cellulose
(C) cellulase and chlorophyllase (D) protease and chlorophyllase
81. Which one of the following non-standard amino acid is present in some naturally occurring proteins ?
- (A) γ -Aminobutyric acid (B) Ornithine
(C) Homocysteine (D) γ -Carboxyglutamic acid

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86. Azacytidine is used to :
- (A) induce DNA damage in the cells
 - (B) repress the transcription of genes
 - (C) activate the transcription of silent genes
 - (D) label the *mRNAs* during transcription
87. Which one of the following is *wrongly* matched ?
- (A) Cryptochrome – Blue light receptor
 - (B) Thigmotropism – Movement of tendrils due to contact
 - (C) Cohesion theory – Movement of water and minerals through xylem
 - (D) Ammonification – Conversion of ammonia into nitrite and nitrate
88. Beta diversity represents :
- (A) the diversity of habitat or ecosystem in a single site
 - (B) the diversity of entire landscape
 - (C) comparison of diversity in habitats or ecosystems
 - (D) the number of species shared by multiple assemblage
89. Which of the following is TRUE of eukaryotic *rRNA* introns ?
- (A) They are group I self splicing introns.
 - (B) They are group II self splicing introns.
 - (C) They are spliced by *mRNA* spliceosomal machinery.
 - (D) *rRNA* splicing is catalyzed by small nucleolar RNAs.

90. A theoretical range of conditions in which a species could inhabit and reproduce with no competition is called :
- (A) niche density (B) niche width
(C) regional density (D) niche partitioning
91. Which one of the following amino acids is represented by a single codon in the universal genetic code ?
- (A) Tyrosine (B) Cysteine
(C) Tryptophan (D) Lysine
92. Which one of the following is *not* a characteristic of an *r*-selected species ?
- (A) Many small offsprings
(B) Large size
(C) Early reproductive maturity
(D) A large allocation of resources to reproduction
93. Which one of the following is TRUE with respect to the affect of methylation on the transcription of eukaryotic genes ?
- (A) DNA methylation is associated with active genes
(B) H3 histone methylation is only associated with activation of gene transcription
(C) H3 histone methylation is only associated with repression of gene transcription
(D) H3 histone methylation is associated with both activation and repression of gene transcription

94. Which one of the following represents the unique feature of cryoelectron microscopy is that it provides the :
- (A) detailed 3D structure of cell
 - (B) detailed 3D cellular dynamics
 - (C) 3D cellular dynamics of a specific protein
 - (D) 3D structure of macromolecules and macromolecular complexes without forming crystals
95. Ecotone represents :
- (A) the transition zone between two or more diverse communities
 - (B) rate of decomposition of biomass in an ecosystem
 - (C) state of equilibrium among various trophic levels in an ecosystem
 - (D) degree of change in species composition along an environmental gradient
96. Which one of the following is a *mismatch* ?
- (A) Edge effect – tendency of increased variety and density of species at community junction
 - (B) Sere – replacement of one community by another
 - (C) Sacred grove – a method of ex-situ conservation
 - (D) Ecotype – genetic races of species with heritable variations that differentiated due to interplay with environmental conditions

97. Shannen-Wiener Index is used for measuring :

- (A) gross primary productivity
- (B) morphological differences between species
- (C) efficiency of energy recycling in the ecosystem
- (D) species diversity in an ecological community

98. Myesthenia Gravis is primarily caused due to disturbance in :

- (A) blood pressure
- (B) adrenergic receptor
- (C) cholinergic receptor
- (D) kidney failure

99. Superantigen :

- (A) binds to Fab portion of IgG on B cells
- (B) activates alternate pathway of complement system
- (C) antigen with dominant epitopes of amino acid repeat sequences
- (D) binds to TCR $V\beta$ and MHC class II molecule

100. A taxonomic system based on all phenotypic similarities, equally weighted and without regard to evolutionary relationship is called :

- (A) phylogeny
- (B) phenetics
- (C) cladistics
- (D) ontogeny

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