



LIFE SCIENCES

Name & Signature of the Invigilator

PAPER – II

OMR Answer Sheet No. :

CODE-04

Roll No. :

(in figures as in Hall Ticket)

Roll Number in words :

042294

Question Booklet Sl. No.

Time : 2 Hours]

No. of Printed Pages : 20

[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.
- You have to tick the items 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.
- 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.

પરીક્ષાર્થીઓ માટે સૂચનાઓ

- આ પાનાની ટોચ પર દર્શાવેલી જગ્યામાં તમારો રોલ નંબર લખો.
- આ પ્રશ્નપત્રમાં બહુવિકલ્પિક ઉત્તરો ધરાવતા સૌ (૧૦૦) પ્રશ્નો આપેલા છે. બધા જ પ્રશ્નો ફરજિયાત છે.
- પરીક્ષાની શરૂઆતમાં આપને પ્રશ્નપુસ્તિકા આપવામાં આવશે. પ્રથમ પાંચ (૫) મિનિટ દરમિયાન તમારે પ્રશ્નપુસ્તિકા ખોલી અને ફરજિયાતપણે નીચે મુજબ પરીક્ષણ કરવું :
 - પ્રશ્નપુસ્તિકાનો વપરાશ કરવા માટે આ કવર પૃષ્ઠની ધાર પર આપેલ સીલ સ્ટીકર ફાડી નાખો. કોઈપણ સંજોગોમાં સીલ સ્ટીકર વગરની કે ખુલ્લી 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 કાળું કરવાનું રહેશે.
 ઉદાહરણ : (A) ☐ (B) ☒ (C) ☐ (D) ☐ કે જ્યાં (B) સાચો જવાબ છે.
- આ પ્રશ્નપુસ્તિકાના પ્રશ્નોના 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.
- કાચું 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 જેનાથી તમારી ઓળખ થઈ શકે, અંકિત કરશો અથવા અલગ ભાષાનો પ્રયોગ કરો, અથવા અન્ય કોઈ અનુચિત સાધનોનો ઉપયોગ કરો, જેમકે અંકિત કરી દીધેલ જવાબ ભૂંસી નાખવો કે સફેદ શાહીનો ઉપયોગ કરી બદલશો તો આપને પરીક્ષા માટે અયોગ્ય જાહેર કરવામાં આવશે.
- પરીક્ષા સમય પૂરો થઈ ગયા બાદ ઓરીજનલ OMR જવાબ પત્રક જે તે નિરીક્ષકને ફરજિયાત સોંપી દેવું અને કોઈ પણ સંજોગોમાં તે પરીક્ષા ખંડની બહાર લઈ જવું નહીં. પરીક્ષા પૂર્ણ થયા બાદ ઉમેદવાર ઓરીજનલ પ્રશ્નપુસ્તિકા અને OMR જવાબ પત્રકની ડુપ્લિકેટ કોપી પોતાની સાથે લઈ જઈ શકે છે.
- માત્ર કાળી / ભૂરી બોલ પોઈન્ટ પેન વાપરવી.
- કેલ્ક્યુલેટર, લોગ ટેબલ અને અન્ય ઇલેક્ટ્રોનિક યંત્રોનો ઉપયોગ કરવાની મનાઈ છે.
- ખોટા જવાબ માટે નકારાત્મક ગુણકોન પ્રશ્ના નથી.

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Your Personal Exam Guide

**LIFE SCIENCES****Paper – II**

1. During sexual reproduction in *Arabidopsis*, how many total meiotic divisions will be required for forming 100 zygotes/100 grains ?
(A) 25 (B) 75
(C) 125 (D) 200
2. Mass spectrometric analysis of a peptide showed there are 5 amino acids in the peptide. They are Gly, Ala, Ser, Thr, Val. How many different sequences can be constructed theoretically using these 5 amino acids ?
(A) 25 (B) 15
(C) 16 (D) 120
3. Which one of the following statements is incorrect in angiosperms ?
(A) They have a dominant sporophyte generation.
(B) Double fertilization occur.
(C) Presence of lignified vascular system.
(D) Independent sporophyte and gametophyte stages.
4. Cultivated bananas are sterile because
(A) Male flower-bearing plants are very rare
(B) They lack natural pollinators
(C) They are triploid and therefore seeds are not set
(D) They are a cross of two unrelated plant species
5. The pigment molecules responsible for photosynthesis are located in the
(A) Cytoplasm
(B) Stroma of chloroplast
(C) Thylakoid membrane of the chloroplast
(D) Mitochondria
6. Match the following fertilization methods in plants and choose the correct option.
1. Hydrophily i. Animals
2. Zoophily ii. Bats
3. Chiropterophily iii. Insects
4. Entomophily iv. Water
(A) 1 – iv, 2 – iii, 3 – ii, 4 – i (B) 1 – i, 2 – iv, 3 – iii, 4 – ii
(C) 1 – iv, 2 – i, 3 – ii, 4 – iii (D) 1 – ii, 2 – iii, 3 – i, 4 – iv



7. Which one of the following pairs of plant growth regulators and their function is mismatched ?
- (A) Auxin – Promote cell elongation
 - (B) Gibberellins – Promote bud and seed dormancy
 - (C) Cytokinins – Delay senescence
 - (D) Absciscic acid – Stimulate closing of stomata
8. Which one of the following statements about the function of Casparian Strip is correct ?
- (A) It prevents excess transpiration from leaves.
 - (B) It plugs the sieve pores of phloem under stress.
 - (C) It regulates the ion movement into the vascular cylinder of the root.
 - (D) It allows gas exchange between atmosphere and cortex of root.
9. Following are the various events that occur during the development of embryo sac in plants. Identify the correct order.
1. PCD of haploid megaspores
 2. MMC formation
 3. Movement of the polar nuclei towards the centre
 4. Cellularization of the embryo sac
 5. Functional Megaspore (FM) formation
 6. Egg cell formation.
- (A) 2, 1, 5, 3, 4, 6
 - (B) 2, 1, 3, 6, 4, 5
 - (C) 1, 3, 5, 4, 6, 2
 - (D) 5, 4, 3, 6, 2, 1
10. Water is an excellent solvent for polar molecules. The reason is that water
- (A) Greatly strengthens electrostatic forces
 - (B) Greatly weakens electrostatic forces
 - (C) Greatly strengthens hydrogen bond formation
 - (D) Greatly weakens hydrophobic interaction
11. Amino acid threonine has how many optical isomers ?
- (A) 1
 - (B) 2
 - (C) 3
 - (D) 4



- 12.** Embryo sac of angiosperm is
- (A) 6-celled 8-nucleate
 - (B) 7-celled 8-nucleate
 - (C) 8-celled 7-nucleate
 - (D) 7-celled 7-nucleate
- 13.** Orientation of a cloned DNA fragment in a plasmid vector can be checked by
- (A) PCR using two gene specific primers
 - (B) Restriction digestion with an enzyme that has a single restriction site within the cloned gene and none in the vector
 - (C) PCR using a combination of one gene specific primer and one vector specific primer
 - (D) Restriction digestion with an enzyme that has two restriction sites within the vector sequence and none in the cloned gene
- 14.** Lignin – a heterogeneous polymer of monolignols, synthesized in
- (A) Phenylpropanoid pathway
 - (B) Terpenoid biosynthesis pathway
 - (C) Carbohydrate biosynthesis pathway
 - (D) Fatty acid biosynthesis pathway
- 15.** What happens to the osmotic potential of the pure water, if we add NaCl and sugars ?
- (A) Osmotic potential of the pure water becomes negative
 - (B) Osmotic potential of the pure water becomes positive
 - (C) Solutes do not show any effect on the osmotic potential
 - (D) Osmotic potential of the pure water becomes zero
- 16.** The term K_m was coined by
- (A) Michaelis Menton
 - (B) Haldane and Briggs
 - (C) Henri
 - (D) Lineweaver Burk
- 17.** Which one of the following is true for enzymes ?
- (A) Enzymes change the rate of a chemical reaction
 - (B) Enzymes affect the final equilibrium of reaction
 - (C) Enzymes are consumed in a chemical reaction
 - (D) Enzymes do not show specificity for a reaction



- 18.** A drop of water on glass slide takes a bead shape and why not alcohol ?
- (A) Water has high surface tension
 - (B) Alcohol has high surface tension
 - (C) Water has low surface tension
 - (D) Both (A) and (C)
- 19.** Exosome in eukaryotes involved in all the following except
- (A) rRNA processing
 - (B) tRNA processing Wobble pairing occurs
 - (C) Polyadenylation
 - (D) mRNA degradation
- 20.** In plants, Tunica-Carpus theory explains the _____ growth and development.
- (A) Root
 - (B) Shoot
 - (C) Leaf
 - (D) Both (A) and (C)
- 21.** Which one of the following present on the HIV virus facilitates binding of the virus to the CD4 receptors ?
- (A) Gp120
 - (B) Gp121
 - (C) Gp40
 - (D) Gp41
- 22.** In some plants, the mechanism where timing of anther dehiscence and stigma receptivity do not coincide to avoid self-pollination is called
- (A) Dichogamy
 - (B) Herkogamy
 - (C) Monoecy
 - (D) Dioecy
- 23.** The T-DNA region of the Ti plasmid of Agrobacterium harbours two genes X and Y. Mutation of gene X produces a rooty tumour while mutation of gene Y produces shoots in the tumour. Based on the above information, which one of the following statements is correct ?
- (A) Gene X encodes auxins and gene Y encodes cytokinins.
 - (B) Gene X encodes cytokinins and gene Y encodes auxins.
 - (C) Gene X and gene Y both encode auxins.
 - (D) Gene X encodes opines while gene Y encodes cytokinins.



- 24.** In an equilibrium reaction the value of ΔG
- (A) $\Delta G = 0$ (B) $\Delta G = -1$
(C) $\Delta G = 1$ (D) $\Delta G = \Delta G^\circ$
- 25.** Transcription factors SPEECHLESS (SPCH), MUTE and FAMA are involved in the development of
- (A) Root (B) Leaf
(C) Trichome (D) Stomata
- 26.** _____ is the physical manifestation of the sum of genetic and environmental effects.
- (A) Genotype (B) Phenotype
(C) Morphotype (D) Phyllotype
- 27.** Arbuscule formation is a distinguishing feature of
- (A) Rhizobium
(B) Endomycorrhizae
(C) Ectomycorrhizae
(D) Lichen
- 28.** _____ are the important regulators of the cell cycle.
- (A) Cyclins and Cyclin-Dependent Kinases
(B) Homeotic genes
(C) SCF proteins
(D) APC complex
- 29.** Which one of the following agents is responsible for Mad cow disease ?
- (A) Viroids
(B) Prions
(C) Tsetse fly
(D) Rota virus
- 30.** The pathogen responsible for the Irish famine is
- (A) *Albugo candida*
(B) *Phytophthora infestense*
(C) *Pernospora parasitica*
(D) *Cochilobolus carbonum*



- 31.** Toll-like receptors are crucial components of
- (A) Adaptive immunity
 - (B) Membrane trafficking
 - (C) Apoptosis
 - (D) Innate immunity
- 32.** $C_{55}H_{72}O_5N_4Mg$ is the chemical formula of
- (A) Chlorophyll a
 - (B) Phytochrome
 - (C) Xanthophyll
 - (D) Anthocyanin
- 33.** Which one of the following is the correct sequence of chemical substances produced during the origin of life on the earth ?
- (A) Water, amino acid, nucleic acid, enzyme
 - (B) Water, amino acid, enzyme, nucleic acid
 - (C) Water, nucleic acid, amino acid, enzyme
 - (D) Nucleic acid, water, amino acid, enzyme
- 34.** In a horticulture plant, red colour fruit (R) is dominant over orange colour (r) and oval-shaped phenotype (D) is dominant over sphere-shaped phenotype (d). Determine the phenotype of the parents, if the cross between red, sphere with red, sphere gives $\frac{3}{4}$ red sphere and $\frac{1}{4}$ orange sphere.
- (A) $RRDD \times rrdd$
 - (B) $Rrdd \times Rrdd$
 - (C) $RrDd \times rrdd$
 - (D) $rrDD \times RRdd$
- 35.** A protein gave positive results with all the tests used against proteins, except absorbance at 280 nm. What is the reason ?
- (A) Absence of aromatic amino acids
 - (B) Presence of aromatic amino acids
 - (C) Absence of aromatic amino acids and peptide bonds
 - (D) Presence of aromatic amino acids and peptide bonds
- 36.** The mutant phenotype can be rescued to wild-type by genetic manipulation. This method is known as
- (A) Gene complementation
 - (B) Gene silencing
 - (C) Gene recombination
 - (D) Gene synthesis



- 37.** Mutation in single nucleotide resulting in a codon that codes for a different amino acid is called
- (A) Transversion
 - (B) Missense mutation
 - (C) Frameshift mutation
 - (D) Nonsense mutation
- 38.** In the phylogenetic analysis the _____ evolutionary model computes distances based on the assumption of equal probability for all substitutions (transitions and transversions).
- (A) Bootstrapping
 - (B) Jukes-Cantor
 - (C) UPGMA
 - (D) Kimura
- 39.** Which mineral elements are found and is required for Cytochrome C function ?
- (A) Copper and Iron
 - (B) Iron and Zinc
 - (C) Magnesium and Copper
 - (D) Sodium and Iron
- 40.** Binary vector is used for
- (A) Gene cloning
 - (B) Gene expression
 - (C) Sequencing
 - (D) Storage
- 41.** In a diploid plant, because of the mutation in a gene which is involved in gamete specification resulted in more than one egg cell and subsequent fertilization resulted in polyembryony. These embryos are
- (A) Haploid
 - (B) Diploid
 - (C) Polyploid
 - (D) Triploid
- 42.** An instrument used to measure the amount of water vapor in air, in soil, or in confined spaces is called as
- (A) Hydrometer
 - (B) Hygrometer
 - (C) Vapourmeter
 - (D) Rain gauge



- 43.** A researcher isolated a novel protein from a medicinal plant which enhances the immunity in humans. After isolation, he purified the protein by a protein purification method in which he used Sephadex G-100. Which principle he might have used for the purification of novel protein ?
- (A) Sodium Dodecyl Sulphate-Polyacrylamide Gel Electrophoresis
(B) Pulse Field Gel Electrophoresis
(C) Counter Immuno Electrophoresis
(D) Gel Filtration Chromatography
- 44.** A protein mixture contain three polypeptides (X, Y and Z) whose masses are 65, 30 and 80 kDa with pI of 6.5, 7.0 and 8.0 respectively, were subjected to standard reducing SDS-PAGE. The order of their separation from top to bottom would be
- (A) X, Y and Z
(B) Y, X and Z
(C) X, Z and Y
(D) Z, X and Y
- 45.** Auxanometer is used for measuring
- (A) Respiration
(B) Plant movement
(C) Plant growth
(D) Transpiration
- 46.** A plant researcher cloned a female gametophyte development related gene. Which one of the following microscopes would you suggest him, if he wants to localize that protein within the female gametophyte with the help of GFP (green fluorescent protein) as a reporter ?
- (A) Dissecting microscope
(B) Scanning electron microscope
(C) Confocal microscope
(D) Phase contrast microscope
- 47.** _____ is used to identify proteins by using peptide mass fingerprinting.
- (A) SDS-PAGE
(B) MALDI-TOF
(C) Chromatography
(D) FACS



- 48.** Which one is not true for the species possessing C4 Pathway ?
- (A) They are able to minimize the photo-respiration by using more efficient enzymes to fix CO_2
 - (B) Oxidative decarboxylation occurs in the chloroplasts of bundle sheath cells
 - (C) They have high compensation point for CO_2
 - (D) They have lower photosynthesis yield in comparison to C3 and CAM plants
- 49.** In a population of 200 diploid individuals, the frequency of neutral alleles P1 and P2 are 0.4 and 0.6 respectively. Given that the population size remains same for three generations and the distribution of traits follow Hardy-Weinberg equilibrium, the frequency of heterozygotes in the third generation would be
- (A) 0.36
 - (B) 0.32
 - (C) 0.24
 - (D) 0.48
- 50.** With reference to chemosynthesis, consider the following statements :
1. The synthesis of organic compounds from inorganic compounds using energy stored in inorganic substances such as sulphur, ammonia and hydrogen. Energy is released when these substances are oxidised by certain organisms.
 2. Organisms inhabiting at the bottom of deep oceans and in dark caves develop their food through the process of chemosynthesis.
- Select the correct answer using the code given below.
- (A) 1 only
 - (B) 2 only
 - (C) Both 1 and 2
 - (D) Neither 1 nor 2
- 51.** Which of the following plant growth regulators is responsible for releasing seed dormancy and promoting seed germination ?
- (A) Auxin
 - (B) Jasmonic acid
 - (C) Gibberellin
 - (D) Abscissic acid
- 52.** Keystone species typically
- (A) Has a disproportionately large impact on an ecosystem in which it occurs
 - (B) Is an example of a lithophyte
 - (C) Reduces overall diversity of an ecosystem
 - (D) Is an herbivore



- 53.** Which one of the following is true for florigen ?
- (A) Produced in the leaves and controls the leaf development
 - (B) Produced in the leaves and is responsible for flowering
 - (C) Produced in the stem and controls the leaf development
 - (D) Produced in the stem and is responsible for controlling phyllotaxy
- 54.** Consider the following statements regarding detritus food chain :
1. Dead plant remains such as leaves, bark, flowers and dead remains of animals, including fecal matter, constitute detritus.
 2. Decomposers are also known as saprotrophs.
 3. Detritivores break down detritus into smaller particles. This process is called fragmentation.
- Select the correct answer using the code given below.
- (A) 2 only
 - (B) 1 and 2 only
 - (C) 2 and 3 only
 - (D) 1, 2 and 3
- 55.** Greatest loss of biodiversity in the last two centuries has resulted from the
- (A) Physical alteration of habitats
 - (B) Introduction of alien species to new ecosystems
 - (C) Use of fossil fuels to support transportation and electrical production
 - (D) Use of rivers, lakes and oceans for transportation
- 56.** Which one of the following amino acids acts as a precursor of auxin biosynthesis ?
- (A) Serine
 - (B) Tyrosine
 - (C) Tryptophan
 - (D) Valine
- 57.** Tendrils in plants are an example of
- (A) Convergent evolution
 - (B) Divergent evolution
 - (C) Adaptive radiation
 - (D) Co-evolution



58. Three of the following criteria have contributed to the recognition of Western Ghats-Sri Lanka and Indo-Burma regions as hotspots of biodiversity :

1. High species diversity
2. High vegetation density
3. High rate of endemism
4. Ethno-botanical importance
5. Threat perception
6. Adaptation of flora and fauna to warm and humid conditions.

Which three of the above are correct criteria in this context ?

- (A) 1, 2 and 6 (B) 1, 3 and 5
(C) 2, 4 and 6 (D) 3, 4 and 6

59. Which one of the following statements is not correct ?

- (A) Polyphasic approach is a grouping of organisms on the basis of the physiological, morphological and biochemical feature.
- (B) Phenetic classification does not distinguish between homologous and analogous characters.
- (C) Numerical taxonomy determines the relationships among organisms on the basis of their phenetic system.
- (D) Holotype is the term given to a duplicate specimen of original type.

60. Which of the following type of productivity counts the total fixation of energy by photosynthesis ?

- (A) Secondary Productivity (B) Primary Productivity
(C) Net Primary Productivity (D) Gross Primary Productivity

61. Synthesis of sucrose during photosynthesis occurs in

- (A) Chloroplast (B) Amyloplast
(C) Cytosol (D) Vacuoles

62. In which type of signaling, the cell that expresses messenger molecules also produces receptors ?

- (A) Autocrine (B) Endocrine
(C) Neocrine (D) Heterocrine



63. Following are some statements regarding the plant growth hormones :

1. Gibberellins control the tropic responses.
2. Stimulation of fruit set by gibberellins has been found in apples.
3. Cytokinins cause delay in leaf senescence.
4. Ethylene induces flowering in mango and pineapple.
5. ABA promotes the stomatal opening by increasing cytosolic calcium concentration.

Which one of the following combinations of above statements is wrong ?

- | | |
|-------------|-------------|
| (A) 1 and 5 | (B) 2 and 3 |
| (C) 3 and 4 | (D) 2 and 4 |

64. Which one of the following statements is not correct ?

- (A) Cytoskeleton is present in eukaryotic cell and absent in prokaryotic cell.
- (B) In biological membranes, integral proteins and lipids interact mainly by hydrophobic interactions.
- (C) All membrane processes, such as pumping and channeling of molecules are carried out by proteins.
- (D) Channel proteins can facilitate both active and passive transport.

65. A person with Klinefelter syndrome is

- | | |
|---------------|--------------|
| (A) Monosomic | (B) Trisomic |
| (C) Triploid | (D) Haploid |

66. Which one of the following is not correct about oncogenes ?

- (A) They are growth regulatory proteins
- (B) They cause cellular transformations
- (C) They are always localized in the nucleus
- (D) They are often over expressed in cancer cells

67. A species of which organism can withstand heavy doses of radioactive radiation, because of multiple copies of genome

- | | |
|-------------------|-------------------|
| (A) Synechocystis | (B) Deinococcus |
| (C) Streptomyces | (D) Mycobacterium |

68. Which one of the following play a key role in photo-morphogenesis in plants ?

- | | |
|-----------------|-----------------|
| (A) Anthocyanin | (B) Chlorophyll |
| (C) Cytochrome | (D) Phytochrome |



- 69.** Which of the following pathways is both anabolic and catabolic ?
(A) Glycolysis (B) Tricarboxylic acid cycle
(C) Glyoxylate pathway (D) Pentose phosphate pathway
- 70.** Gluconeogenesis occurs in which organ ?
(A) Liver (B) Muscle
(C) Pancreas (D) Stomach
- 71.** Which of the following is not true with reference to microtubules ?
(A) They are involved in the movement of mitotic spindle
(B) They are involved in the movement of flagella
(C) They are involved in the cytokinesis
(D) Microtubule associated proteins are involved in tubulin polymerization
- 72.** Which one of the following amino acids is glucogenic as well as ketogenic ?
(A) Leucine (B) Lysine
(C) Isoleucine (D) Valine
- 73.** Which one of the following vitamins plays important role in carboxylation reactions ?
(A) Riboflavin (B) Folic acid
(C) Niacin (D) Biotin
- 74.** Which one of the following plays important role in single carbon transfer reactions ?
(A) Tetrahydrofolate (B) Thiamin pyrophosphate
(C) Biotin (D) Niacin
- 75.** Which one of the following processes does not occur in the mitochondria of mammalian cell ?
(A) Synthesis of DNA (B) Protein synthesis
(C) Fatty acid biosynthesis (D) β -oxidation of fatty acids
- 76.** The genome of which virus obeys Chargaff's rule ?
(A) Adenovirus (B) ϕ X 174
(C) μ phage (D) TMV



- 77.** Which one of the following enzymes attaches complementary bases to the template strand ?
(A) DNA polymerase (B) RNA primer
(C) Helicase (D) Single strand binding protein
- 78.** Which of the following show up to 100-fold variation in the size of their genomes ?
(A) Angiosperms (B) Mammals
(C) Bacteria (D) Amphibians
- 79.** Among the following which DNA will show the lowest $Cot_{1/2}$?
(A) *E.coli* genomic DNA
(B) T_4 DNA
(C) Calf thymus non-repetitive DNA
(D) *Saccharomyces cerevisiae* genomic DNA
- 80.** Among the following genomes which one has the least gene density ?
(A) *Homo sapiens*
(B) *Saccharomyces cerevisiae*
(C) *Oryza sativa*
(D) *Caenorhabditis elegans*
- 81.** The compound 5-hydroxy tryptamine is also called
(A) Serotonin (B) Histamine
(C) Dopamine (D) Didydroxy phenyl alanine
- 82.** During the replication of DNA, which one of the following enzymes is responsible for the synthesis of okazaki fragments ?
(A) DNA polymerase I (B) DNA polymerase II
(C) DNA polymerase III (D) RNA polymerase I
- 83.** Ping-pong mechanism is observed with
(A) Decarboxylase (B) Transaminase
(C) Glutamate dehydrogenase (D) Glutamine synthetase
- 84.** Lysine is _____ type of amino acid on the basis of the product of degradation.
(A) Glucogenic (B) Glucogenic and ketogenic
(C) Basic chain (D) Ketogenic



- 85.** The biosynthesis of which amino acid is similar to nucleic acid biosynthesis
(A) Phenyl alanine (B) Tryptophan
(C) Glutamic acid (D) Histidine
- 86.** Negative deviation from Beer-Lambert law is seen in absorption spectroscopy, when the chromophore
(A) Undergoes decomposition
(B) Concentration is too high
(C) Concentration is too low
(D) Undergoes aggregation
- 87.** Ellipticity is measured in which spectroscopy ?
(A) Circular dichroism
(B) Atomic absorption spectroscopy
(C) Raman spectroscopy
(D) Infrared spectroscopy
- 88.** The pI value of ubiquitin is 6.7. This protein can bind DEAE cellulose column at what pH ?
(A) Any pH, since binding to DEAE cellulose is independent of pH
(B) At a pH above 6.7
(C) At a pH below 6.7
(D) At pH 6.7, as a protein shows highest affinity to ion exchanger at its pI
- 89.** The hormone that is associated with maintenance of blood pressure is
(A) Adrenaline (B) Norepinephrine
(C) Aldosterone (D) Dopamine
- 90.** The electromagnetic radiation used in ESR is in the region of
(A) Ultraviolet (B) Gamma radiation
(C) Radiowaves (D) Microwaves
- 91.** What is the pI value of a nonstandard amino acid X whose pK_1 , pK_2 and pK_3 values are 2.1, 7.8 and 11.3 ?
(A) 6.7 (B) 4.95
(C) 9.55 (D) 7.06



- 92.** The other name for blue shift in absorption spectroscopy is
(A) Bathochromic shift (B) Quantum shift
(C) Hypsochromic shift (D) Stoke's shift
- 93.** The hormone that is associated with the feeling of happiness and pleasure is
(A) Epinephrine (B) Norepinephrine
(C) Serotonin (D) Dopamine
- 94.** This enzyme is a marker enzyme of glyoxysomes
(A) Isocitrate lyase (B) Aconitase
(C) Citrate synthase (D) Malate dehydrogenase
- 95.** Which of the following hormones does not belong to the group of other three with respect to biosynthesis ?
(A) Oxytocin (B) Serotonin
(C) Adrenaline (D) Dopamine
- 96.** Cori cycle occurs in these organs of the body
(A) Liver and kidney (B) Muscle and liver
(C) Liver and pancreas (D) Muscle and pancreas
- 97.** The larva of which phylum of animals is bilaterally symmetrical though the adult form shows radial symmetry ?
(A) Annelida (B) Coelenterata
(C) Mollusca (D) Echinodermata
- 98.** Urinary and genital systems develop from which germ layer or layers ?
(A) Ectoderm (B) Mesoderm
(C) Endoderm (D) Ectoderm and mesoderm
- 99.** Brain and central nervous system develop from which germ layer or layers ?
(A) Ectoderm (B) Mesoderm
(C) Endoderm (D) Ectoderm and mesoderm
- 100.** Pepsin in stomach is secreted by which cells ?
(A) Parietal cells (B) Foveolar cells
(C) Chief cells (D) G cells
-



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