LIFE SCIENCES

Name & Signature of the Invigilator

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PAPER-III
SEPT-16/04

OMR Answer Sheet No. : | | | | | |

Roll No. : | | | | | |

(in figures as in Hall Ticket)

Roll Number in words : .....

.....

Time : 2.30 Hours] **No. of Printed Pages : 20** **[Maximum Marks : 150**

Instructions for the Candidates

1. Write your Roll Number in the space provided on the top of this page.
2. This paper consists of **Seventy Fifty (75)** multiple choice type of questions. All questions are compulsory.
3. 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 :
   (*i*) 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.
   (*ii*) 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.
   (*iii*) 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.
4. 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) ● (C) (D) where (B) is the correct response.
5. Your responses to the items are to be indicated on the OMR Answer Sheet under Paper – III only. If you mark your response at any place other than in the oval in the OMR Answer Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
8. 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.
9. 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.
10. Use only Blue/Black Ball point pen.
11. Use of any calculator or log table etc., is prohibited.
12. There shall be no negative marking.
13. In case of any discrepancy in the English and Gujarati versions of questions, English version will be taken as final.

પરીક્ષાર્થીઓ માટે સૂચનાઓ :

1. આ પાનાની ટોચ પર દર્શાવેલી જગ્યામાં તમારો રોલ નંબર લખો.
2. આ પ્રશ્નપત્રમાં બહુવૈકલ્પિક ઉત્તરો ધરાવતા **પંચોતેર (૭૫)** પ્રશ્નો આપેલા છે. **બધાજ** પ્રશ્નો ફરજિયાત છે.
3. પરીક્ષાની શરૂઆતમાં આપને પ્રશ્નપુસ્તિકા આપવામાં આવશે. પ્રથમ પાંચ (૫) મિનિટ દરમ્યાન તમારે પ્રશ્નપુસ્તિકા ખોલી અને ફરજિયાતપણે નીચે મુજબ પરીક્ષણ કરવું :
   (*i*) પ્રશ્નપુસ્તિકાનો વપરાશ કરવા માટે આ કવર પૃષ્ઠની ધાર પર આપેલ સીલ સ્ટીકર ફાડી નાખો. કોઈપણ સંજોગોમાં સીલ સ્ટીકર વગરની કે ખુલ્લી પ્રશ્નપુસ્તિકા સ્વીકારશો નહીં.
   (*ii*) કવર પૃષ્ઠ પર છપાયેલ નિર્દેશાનુસાર પ્રશ્નપુસ્તિકાના પ્રશ્નો, પૃષ્ઠો અને સંખ્યાને બરાબર ચકાસી લો. ખામીયુક્ત પ્રશ્નપુસ્તિકા કે જેમાં પ્રશ્નો/પૃષ્ઠો ઓછા હોય, બે વાર છપાયા હોય, અનુક્રમમાં અગવા અન્ય કોઈ ક્ષતિ હોય અર્થાત્ 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. પછી થી, પ્રશ્નપુસ્તિકા બદલવામાં આવશે નહીં કે કોઈ વધારાનો સમયગાળો આપવામાં આવશે નહીં.
   (*iii*) આ ચકાસણી સમાપ્ત થાય પછી, પ્રશ્નપુસ્તિકાનો નંબર OMR જવાબ પત્રક પર લખવો અને OMR જવાબ પત્રકનો નંબર પ્રશ્નપુસ્તિકા પર લખવો.
4. 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) ● (C) (D) કે જ્યાં (B) સાચો જવાબ છે.
5. આ પ્રશ્નપુસ્તિકાના પ્રશ્નો ના જવાબ અલગથી આપવામાં આવેલ OMR જવાબ પત્રકમાં પેપર–III 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
6. અંદર આપેલ સૂચનાઓ ધ્યાનપૂર્વક વાંચો.
7. કાચું કામ (Rough Work) પ્રશ્નપુસ્તિકાના અન્તિમ પૃષ્ઠ પર કરવું.
8. જો આપ OMR જવાબ પત્રક નિયત જગ્યા સિવાય અન્ય કોઈપણ સ્થાને, આપનું નામ, રોલ નંબર, ફોન નંબર અથવા એવું કોઈ ચિન્હકે 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 શાહીનો ઉપયોગ કરી બદલશો તો આપને પરીક્ષા માટે અયોગ્ય જાહેર થઈ શકો છો.
9. પરીક્ષા સમય પૂરો થઈ ગયા બાદ ઓરીજીનલ OMR જવાબ પત્રક જે તે નિરીક્ષકને ફરજીયાત સોંપી દેવું અને કોઈ પણ સંજોગોમાં તે પરીક્ષાખંડની બહાર લઈ જવું નહીં. પરીક્ષા પૂર્ણ થયા બાદ ઉમેદવાર ઓરીજીનલ પ્રશ્નપુસ્તિકા અને OMR જવાબ પત્રકની ડુપ્લિકેટ કોપી પોતાની સાથે લઈ જઈ શકે છે.
10. માત્ર કાળી/ભૂરી બોલ પોઈન્ટ પેન વાપરવી.
11. કેલ્કયુલેટર અને અન્ય ઈલેક્ટ્રોનિક યંત્રોનો ઉપયોગ કરવાની મનાઈ છે.
12. ખોટા જવાબ માટે નકારાત્મક ગુણાંકન પ્રથા નથી.
13. પ્રશ્નપુસ્તિકાના કોઈ પ્રશ્નમાં અનુવાદ અંગે કોઈ વિવાદ/મતભેદ જણાય તો અંગ્રેજી વર્ઝન યોગ્ય ગણાશે.

SEAL

LIFE SCIENCES

PAPER - III

Note : This paper contains **SEVENTY FIVE (75)** Multiple-choice questions, each question carrying **TWO (2)** marks. Attempt **All** questions.

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1. Which of the following is a ketotriose ?

   (A) Glyceraldehyde (B) Dihydroxyacetone

   (C) Erythrose (D) Arabinose

2. N-acetyl-Neuraminic acid is :

   (A) Sugar acid (B) Amino sugar acid

   (C) Amino sugar (D) Sugar alcohol

3. Milk protein casein is a :

   (A) Nucleoprotein (B) Phosphoprotein

   (C) Lipoprotein (D) Glycoprotein

4. When the absorption of uv-light by double stranded DNA increases, this is called as :

   (A) Hyperchromic effect (B) Hypochromic effect

   (C) Polychromic effect (D) Achromic effect

5. The helicase and primase form a functional unit within the replication complex called as :

   (A) Replicosome (B) Primosome

   (C) Holosome (D) Endosome

6. Chemical reaction of a disulfide bond with the following reagent is irreversible :

(A) Glutathione (B) Performic Acid

(C) DTT (D) Cysteine

7. Cell cycle arrest at the G_2 check point is mediated by :

(A) GPCR mediated signalling cascade

(B) Phosphorylation/Dephosphorylation cascade

(C) Inhibition of gene transcription

(D) Activation of apoptosis

8. During cell cycle yeast cells have a regulatory point that occurs late in G_1 phase known as :

(A) Restriction point (B) START

(C) Activation point (D) Resting point

9. Which of the following, mediate intraspecies quorum sensing in Gram +ve bacteria ?

(A) Autoinducer-2

(B) Autoinducer peptide

(C) Acyl homoserine lactone

(D) N-3-(Oxohexanoyl) homoserine lactone

10. In angiosperms, the only functional cells with cytoplasm but no nucleus are :

(A) Vessels (B) Companion cells

(C) Sieve tube elements (D) Fibres

11. Mycoplasma are bacterial cells that :

(A) Reproduce on artificial media

(B) Have a rigid cell wall

(C) Are resistant to penicillin

(D) Stain well with Grams stain

12. Mitochondrion is known as the powerhouse of the cell because :

(A) Mitochondrion is a big organelle in the cell

(B) Mitochondrion oxidises fatty acids

(C) It generates ATP by oxidative phosphorylation

(D) It transports cations from cytoplasm to mitochondrion

13. Telomeres are rich in which nucleotide ?

(A) Adenine (B) Guanine

(C) Thymine (D) Cytosine

14. Which of the following is *not* a conjugated protein ?

(A) Peptone (B) Phosphoprotein

(C) Lipoprotein (D) Glycoprotein

15. Enzymes that catalyse interconversion of optical, geometrical or positional isomers are :

(A) Ligases (B) Lyases

(C) Hydrolases (D) Isomerases

16. Proteins that block the synthesis of RNA at specific genes are called as :

(A) Suppressors (B) Repressors

(C) Terminators (D) Operons

17. In single stranded RNA viruses replication occurs by which of the following enzymes ?

(A) Reverse transcriptase (B) RNA polymerase

(C) RNA replicase (D) Telomerase

18. The release of which hormone is inhibited by Thyroxine ?

(A) LH (B) TSH

(C) GH (D) FSH

19. Insulin binds to the α-subunit of the transmembrane insulin receptor first and :

(A) Induces dimerisation of the insulin receptor

(B) Induces tyrosine phosphorylation of the β-subunit

(C) Induces serine phosphorylation of α-subunit

(D) Induces threonine phosphorylation of the β-subunit

20. TLRs are involved in the recognition of the pathogen including bacteria/ virus to :

(A) Release cytokines and kill the infectious organism

(B) Activate phosphorylation and induce apoptosis

(C) Stimulate cell cycle and induce proliferation

(D) Induce apoptosis of cells

21. Colchicine has been used in the treatment of acute gout disease because of its :

(A) Ability to inhibit cell proliferation

(B) Ability to interfere with cell cycle

(C) Ability to interfere with microtubule dynamics

(D) Ability to induce apoptosis

22. How many transmembrane helices are present in GPCR ?

(A) 6 (B) 4

(C) 7 (D) 8

23. Opium derivatives are bound by :

(A) Adenylate cyclase (B) GPCRs

(C) Insulin Receptor (D) Steroid Receptor

24. Steroid hormones elicit their actions by binding to the steroid receptors located in :

(A) Plasma membrane (B) Endoplasmic reticulum

(C) Lysosomes (D) Nucleus

25. Which of the following Gymnosperms lack archegonium ?

(A) *Ginkgo* (B) *Pinus*

(C) *Cycas* (D) *Gnetum*

26. Male gametophyte in Angiosperms possesses :

(A) One vegetative cell and two male gametes

(B) One vegetative cell and one male gamete

(C) Two vegetative cells and two male gametes

(D) Two vegetative cells and one male gamete

27. Double fertilisation is a characteristic feature of :

(A) Dicots (B) Monocots

(C) Gymnosperms (D) Both dicots and monocots

28. One of the following sequences is *correct* for vertebrate development :

(A) Blastula — Gastrula — Neurula

(B) Blastula — Morula — Neurula

(C) Gastrula — Morula — Blastula

(D) Neurula — Morula — Gastrula

29. Asexual reproduction as fission is very common in ..... .

(A) Protozoans (B) Poriferans

(C) Cnidarians (D) Echinoderms

30. One of the following larva during development give rise to triploblastic-coelomate animal ?

(A) Planula (B) Ephyra

(C) Miracidium (D) Trochophore

31. The chief source of auxin in plants is :

(A) Pith of the stem (B) Pericycle

(C) Shoot apex (D) Lateral buds

32. Gibberellins are chemically :

(A) Triterpenes (B) Monoterpenes

(C) Diterpenes (D) Tetraterpenes

33. Transfer cells are present near or at :

(A) root hairs (B) stem nodes

(C) minor veins of leaves (D) endodermis

34. Zinc is essential for :

(A) biosynthesis of IAA (B) chlorophyll synthesis

(C) stomatal mechanism (D) Calvin cycle

35. Which one of the following processes has not been implicated in the mechanism of opening of stomata ?

(A) Production of organic acids

(B) Hydrolysis of starch in guard cells

(C) Uptake of K^+ ions in guard cells

(D) Loss of water and shrinkage in guard cells

36. Insectivorous plants grow in places where :

(A) Light conditions are poor

(B) Temperature and humidity are high

(C) Soil is poor in nitrogen

(D) Soil is highly saline

37. The 'ductus caroticus' is found in between ..... .

(A) Pulmonary and systemic aorta

(B) Systemic and carotid aorta

(C) Subclavian and carotid aorta

(D) Subclavian and systemic aorta

38. The disease 'diabetes incipidus' is related to ..... .

(A) Insulin (B) Glucagon

(C) Aldosterone (D) Thyroxine

39. The function of 'corpus leuteum' is to :

(A) Facilitate implantation (B) Facilitate fertilization

(C) Facilitate ovulation (D) Facilitate lactation

40. The blood pressure in kidney is maintained by ..... .

(A) Thyroid secretion

(B) Thymus secretion

(C) Renin-angiotensin secretion

(D) Adrenal secretion

41. The movement of eyeball is regulated by ..... .

(A) Olfactory nerve (B) Optic nerve

(C) Occulomotor nerve (D) Auditory nerve

42. The colour vision in humans is attributed to ..... .

(A) Cone cells (B) Rod cells

(C) Schwann's cells (D) Cortical cells

43. For barcoding of an animal species most conserved molecule used is ..... .

(A) Nuclear DNA (B) Mitochondrial DNA

(C) mRNA (D) tRNA

44. The colour blindness in human is due to point mutation, it is ..... .

(A) Autosomal disorder (B) Metabolic disorder

(C) X-linked disorder (D) Y-linked disorder

45. If a red-flowered plant is crossed with a white flowered individual and the offspring has pink flowers, the genotypic expression indicates :

(A) Multiallelic condition (B) Mutation

(C) Codominance (D) Incomplete dominance

46. From which grand parent or grand parents did you inherit your mitochondria ? is it your ..... .

(A) Mothers parents (B) Paternal grandfather

(C) Gandmothers (D) Maternal grandmother

47. Dosage compensation is observed with ..... .

(A) The Y-chromosome of males

(B) The X-chromosome of males

(C) The X-chromosome of male and female sexes

(D) One of the X-chromosome of females

48. An Hfr bacterium is one that contains ..... .

(A) many unusual plasmids

(B) chromosomal material acquired from a recipient cell

(C) a plasmid integrated into its chromosome

(D) the ability to undergo transduction

49. Occurrence of pollinia in Orchidaceae and Asclepiadaceae is an example of :

(A) Parallelism (B) Analogy

(C) Convergence (D) Reversal

50. DNA barcoding has maximum applications in :

(A) tracing the ancestry of a species

(B) detection of mutants

(C) identification and delimitation of species

(D) assessment of phylogenetic relationships between taxa

51. Which of the following statements is *not* as per ICBN ?

(A) The names of all taxonomic groups except species are based on the type method

(B) Names of two authors are linked by *ex* when the first had proposed the name which was later validly published by the second

(C) Principle of priority is applicable only upto family rank, not above it

(D) Name of the cultivar is not in italics and it starts with a capital letter

52. One of the following terms used for appendages of animals is correct for vertebrates ?

(A) Tetrapoda (B) Hexapoda

(C) Octopoda (D) Decapoda

53. The 'horse-shoe crab' is classified in ..... .

(A) Cephalopoda (B) Crustacea

(C) Arachnida (D) Insecta

54. Clitellum is the structure of oligochaeta which is associated with ..... .

(A) Digestive system (B) Respiratory system

(C) Circulatory system (D) Reproductive system

55. Which part of India is part of Saudaland Biodiversity Hotspot ?

(A) Sunderbans (B) Nicobar islands

(C) Nagaland (D) Ladakh

56. *Podophyllum hexandrum* is an endangered medicinal plant of :

(A) Indo-gangetic plains (B) Thar desert

(C) Himalayas (D) Western Ghats

57. Which of the following type of forests occupies the largest area in India ?

(A) Tropical moist forest (B) Tropical deciduous forest

(C) Temperate forest (D) Alpine forest

58. Kyoto protocol focuses on :

(A) Breeding crops that can benefit from elevated CO_2

(B) Reduction in CO_2 emissions by various countries

(C) Finding ways of fixing atmospheric CO_2 in below soil biomass

(D) Giving monetary compensation to countries likely to be affected by global warming

59. A keystone species is one which :

(A) if its disapearance may lead to collapse of the ecosystem

(B) is rare, but may become locally extinct soon

(C) yields hard and waterproof timber

(D) if it hybridises readily with related species

60. Eutrophication can be observed in :

(A) Stream (B) Lake

(C) River (D) Ocean

61. Group of fish that stay together and perform swimming in the same direction in a coordinated manner is known as ..... .

(A) Schooling (B) Shoaling

(C) Swarming (D) Sinking

62. Diurnal ascending movements of plankton is termed as ..... .

(A) Photokinesis (B) Phototaxis

(C) Klinokinesis (D) Geotaxis

63. Speciation that occurs when biological populations of the same species become isolated from each other to an extent which prevents genetic interchange is ..... .

(A) Sympatric speciation (B) Allopatric speciation

(C) Parapatric speciation (D) Peripatric speciation

64. In phenerozoic Eon, which one of the following era is popularly known as 'Era of fishes' ?

(A) Cenozoic era (B) Mesozoic era

(C) Palaeozoic era (D) Cryptozoic era

65. Which one of the following is *true* for cephalochordates ?

(A) Presence of ventral nerve cord and notochord

(B) Presence of dorsal nerve cord and notochord

(C) Presence of dorsal nerve cord and vertebral column

(D) Presence of notochord and jaws

66. Angiosperms are believed to have originated about ..... .

(A) 450 million years ago (MYA)

(B) 340 MYA

(C) 135 MYA

(D) 95 MYA

67. Amino benzyloxymethyl filter paper is commonly used for the transfer in :

(A) Western Blotting (B) Southern Blotting

(C) Dot Blotting (D) Northern Blotting

68. What is the best cloning vector for long DNA inserts ?

(A) Bacteriophage

(B) Yeast artificial Chromosomes

(C) Bacterial artificial Chromosomes

(D) Both bacterial and yeast artificial Chromosomes

69. When a mixture of proteins of various size and shape, is applied to gel filtration column :

(A) The smallest protein comes first

(B) The globular protein comes first

(C) Proteins are eluted in an increasing order of molecuar mass

(D) Proteins are eluted in a decreasing order of molecular mass with largest coming first

70. The cotton plant transgenic for crystaloprotein has been developed for :

(A) Enhancing fiber length

(B) Insect resistance

(C) Drought resistance

(D) Enhacing mineral content

71. DPT vaccine confers protection from all the diseases, *except* for :

(A) Diphtheria (B) Pertussis

(C) Tuberculosis (D) Tetanus

72. Which of the following treatments enhanced phytoremediation of metals ?

(A) Salt treatment (B) Acid treatment

(C) Alkali treatment (D) Sugar treatment

73. Overproduction of chitinase enzymes is possible by solid state fermentation due to :

(A) Catabolite inhibition

(B) Prevention of catabolite repression

(C) Solid substrate

(D) Catabolite repression

74. DNA fingerprinting has proved very useful, but it finds no use in :

(A) Crime detection (B) Paternity analysis

(C) Functional genomics (D) Settlement of IPR issues

75. When we carry out subcellular fractionation by differential centrifugation, which cell component will pellet last ?

(A) Plasma membrane (B) Lysosomes

(C) Micorsomes (D) Cytosol

ROUGH WORK

SEAL