

LIFE SCIENCE

Paper - II

OCT-10/04

Signature of Invigilators

Roll No.

(In figures as in Admit Card)

1.

Roll No.

2.

(in words)

Time Allowed : 75 Minutes]

[Maximum Marks : 100

Instructions for the Candidates

1. Write your Roll Number in the space provided on the top of this page.
2. This paper consists of **fifty (50)** multiple choice type questions. **All** questions are compulsory.
3. Each item has upto four alternative responses marked (A), (B), (C) and (D). The answer should be a capital letter for the selected option. The answer letter should entirely be contained within the corresponding square.

Correct method



Wrong method



OR



4. Your responses to the items for this paper are to be indicated on the ICR Answer Sheet under Paper II only.
5. Read instructions given inside carefully.
6. Extra sheet is attached at the end of the booklet for rough work.
7. You should return the test booklet to the invigilator at the end of paper and should not carry any paper with you outside the examination hall.
8. There shall be no negative marking.
9. Use of calculator or any other electronic devices is prohibited.

પરીક્ષાર્થીઓ માટે સૂચનાઓ :

1. આ પાનાની ટોચમાં દર્શાવેલી જગ્યામાં તમારો રોલનંબર લખો.
2. આ પ્રશ્નપત્રમાં બહુવૈકલ્પિક ઉત્તરો ધરાવતા કુલ **પચાસ (૫૦)** પ્રશ્નો આપેલા છે. **બધા જ** પ્રશ્નો ફરજિયાત છે.
3. પ્રત્યેક પ્રશ્ન વધુમાં વધુ ચાર બહુવૈકલ્પિક ઉત્તરો ધરાવે છે. જે (A), (B), (C) અને (D) વડે દર્શાવવામાં આવ્યા છે. પ્રશ્નનો ઉત્તર કેપીટલ સંજ્ઞા વડે આપવાનો રહેશે. ઉત્તરની સંજ્ઞા આપેલ પાનામાં બરાબર સમાઈ જાય તે રીતે લખવાની રહેશે.

ખરી રીત :



ખોટી રીત :



4. આ પ્રશ્નપત્રના જવાબ આપેલ ICR Answer Sheet ના Paper II વિભાગની નીચે આપેલ પાનાઓમાં આપવાના રહેશે.
5. અંદર આપેલ સૂચનાઓ કાળજીપૂર્વક વાંચો.
6. આ બુકલેટની પાછળ આપેલું પાનું રફ કામ માટે છે.
7. પરીક્ષા સમય પૂરો થઈ ગયા પછી આ બુકલેટ જે તે નિરીક્ષકને સોંપી દેવી. કોઈપણ કાળ પરીક્ષા ખંડની બહાર લઈ જવો નહીં.
8. ખોટા જવાબ માટે નેગેટિવ ગુણાંકન પ્રથા નથી.
9. કેલ્ક્યુલેટર અને ઈલેક્ટ્રોનિક યંત્રોનો પ્રયોગ કરવાની મનાઈ છે.

LIFE SCIENCE

PAPER-II

Note : This paper contains **FIFTY (50)** multiple-choice questions, each question carrying **TWO (2)** marks. Attempt **All** the questions.

1. Atoms with same atomic number and different atomic weight are known as :
(A) isoforms (B) isobars
(C) isotopes (D) isomers
2. Which one of the following is *not* a high energy molecule ?
(A) Fructose-6-phosphate (B) Acetyl phosphate
(C) Creatine phosphate (D) ADP
3. Which one of the following stabilizing interactions is in the increasing order of energy ?
(A) van der Waals, electrostatic, H-bonding, hydrophobic
(B) van der Waals, hydrophobic, H-bonding, electrostatic
(C) hydrophobic, van der Waals, H-bonding, electrostatic
(D) hydrophobic, van der Waals, electrostatic, H-bonding
4. β -pleated structure is characteristic of one of these proteins :
(A) collagen (B) keratin
(C) myosin (D) fibroin
5. An example for a substrate linked phosphorylation is :
(A) succinyl Co-A to succinic acid
(B) malic acid to oxaloacetic acid
(C) succinic acid to fumaric acid
(D) isocitric acid to α -ketoglutaric acid

6. F_0-F_1 ATPase is present in the following compartment of mitochondria :
- (A) matrix (B) inner membrane
(C) outer membrane (D) intermembranal space
7. One of the following constituents increases the stability of cell membranes :
- (A) phospholipid (B) glycoprotein
(C) cholesterol (D) glycolipid
8. The division of centrioles is accomplished in this part of the cell cycle :
- (A) G_1 (B) prophase
(C) S (D) G_2
9. Insulin inhibits glycogenolysis by inhibiting :
- (A) phosphorylase-a (B) protein kinase
(C) phosphorylase-b (D) phosphorylase-b kinase
10. In response to salinity stress *Halobacterium* accumulates :
- (A) K^+ (B) Na^+
(C) Mn^{++} (D) Ca^{++}
11. Replisome, a conglomerate of proteins, found at the replication fork of DNA has which of the following proteins ?
- (i) SSB protein
(ii) DNA gyrase
(iii) DNA helicase
(iv) Primase
(v) DNA polymerase III
(vi) Exonuclease
- (A) (i), (ii), (iii) and (v) (B) (i), (iii), (iv) and (v)
(C) (iii), (iv) and (v) (D) (ii), (iii) and (iv)

12. Holiday junction is observed during :
- (A) mitosis (B) interphase
(C) DNA repair (D) recombination
13. Amongst the bacterial sigma subunit of RNA polymerase, one of the following is induced by the environmental conditions :
- (A) sigma 54 (B) sigma 32
(C) sigma E (D) sigma F
14. Pre-mi-RNA are synthesised by :
- (A) RNA polymerase II
(B) RNA polymerase I
(C) RNA polymerase III
(D) Mitochondrial RNA polymerase
15. Attenuation is a process of regulation of bacterial amino acid biosynthetic genes. It involves :
- (A) decrease in the level of *m*-RNA synthesis
(B) increased degradation of *m*-RNA
(C) formation of truncated *m*-RNA
(D) shift in the reading frame resulting in transcription termination
16. Which one of the following is *not* a secondary messenger ?
- (A) NO (B) IP₃
(C) c-GMP (D) AMP
17. Cell proliferation is *not* mediated by one of the following molecules :
- (A) p⁵³ (B) Caspase
(C) p²¹ (D) BCl²

18. An immunosuppressive antibiotic is :
- (A) Actinomycin-D (B) Rifampicin
(C) Cyclosporin-A (D) Cephalosporin-C
19. IgE is well known for its role in :
- (A) phagocytosis
(B) passive immunity
(C) reticulo-endothelial reactions
(D) allergic reactions
20. Which of the following statements is *correct* ?
- (A) Naive B cells have limited life span.
(B) Naive B cells secrete IgG.
(C) B cells are produced only in the early stage of development.
(D) Plasma cells secreting antibodies survive in the body for many months.
21. Spiral type of cleavage occurs in :
- (A) kangaroo embryo (B) annelid embryo
(C) ophidian embryo (D) human embryo
22. One of the following structures acts as an embryonic organizer during chick embryogenesis :
- (A) area opeca (B) area pellucida
(C) primitive streak (D) mesodermal somites

23. Regression of tail in anuran tadpole occurs under the influence of :
- (A) growth hormone (B) yolk
(C) oxytocin (D) thyroxin
24. In contrast to animals, plants exhibit :
- (A) indeterminate growth and persistent morphogenesis
(B) determinate growth and persistent morphogenesis
(C) indeterminate growth and non-persistent morphogenesis
(D) determinate growth and non-persistent morphogenesis
25. Proembryo of a plant is the zygotic division at :
- (A) 64 cells stage (B) 32 cells stage
(C) 16 cells stage (D) 02 cells stage
26. Agranal as well as granal chloroplasts are found in these plants :
- (A) C_3 (B) C_4
(C) CAM (D) Both C_4 and CAM
27. Genetic dwarfism can be countered by treating the plant with :
- (A) kinetin (B) auxin
(C) gibberellic acid (D) abscisic acid
28. Chlorofluorenol, a plant growth hormone, that does *not* affect the unicellular and simple filamentous plants, is commonly called :
- (A) morphactin (B) phyllocaline
(C) vernalin (D) dormin

29. If a diazotroph has this enzyme, the nitrogen fixation is more efficient :
- (A) cytochrome oxidase (B) hydrogenase
(C) phosphate kinase (D) adenylate cyclase
30. What is *not true* for the movement of sap from a sugar source to sugar sink ?
- (A) It occurs through apoplast of sieve tube elements.
(B) It results in translocation from root to shoot tip.
(C) It is similar flow of sap in xylem based on negative pressure.
(D) It is dependent on the extent of primary production.
31. One of the following mechanoreceptors are situated immediately beneath the epidermis of skin :
- (A) Meissner's corpuscles (B) Pacinian corpuscles
(C) Organs of Ruffini (D) Bulbs of Krause
32. Vertebrate blood transports oxygen largely in the form of :
- (A) H-HbO₂ (B) HbO₂
(C) K-HbO₂ (D) K-HbO₃
33. Purely sensory cranial nerves are :
- (A) I, II and VIII (B) III, IV and VI
(C) V, VII and IX (D) II, III and IV
34. One gene one enzyme hypothesis was proposed based on mutational studies in *Neurospora crassa* by :
- (A) Watson and Crick (B) Beadle and Tatum
(C) Harshey and Chase (D) Venter and Smith

35. If gene 'A' is dominant over 'a' and 'B' is incomplete dominant over 'b', then the number of categories of phenotypes resulting from a dihybrid cross would be :
- (A) 4 (B) 6
(C) 8 (D) 16
36. VDJ recombination is an example of :
- (A) homologous recombination
(B) site specific recombination
(C) non-homologous recombination
(D) transposition
37. Immature form of *Plasmodium* inoculated by mosquito in human body is :
- (A) cryptozoite (B) merozoite
(C) metacryptozoite (D) sporozoite
38. The capacity of regeneration in sponges is due to the presence of :
- (A) amoebocytes (B) archeocytes
(C) concoblasts (D) scleroblasts
39. *Thermus aquaticus* is a thermophile :
- (A) bacterium (B) archebacterium
(C) mould (D) protozoan

40. Wilt of pigeon pea is caused by :
- (A) *Alternaria alternata*
 - (B) *Curvularia lunata*
 - (C) *Fusarium oxysporum*
 - (D) *Helminthosporium victoriae*
41. The common Chinese waders visiting Indian wet lands are :
- (A) painted storks
 - (B) spotbill ducks
 - (C) coots
 - (D) ringed plovers
42. A habitat *not* conducive to primary productivity is :
- (A) cave
 - (B) pond
 - (C) meadow
 - (D) river bank
43. The bacteria *Thiobacillus* and *Baggiatoa* play a role in :
- (A) water cycle
 - (B) phosphate cycle
 - (C) nitrogen cycle
 - (D) sulphur cycle
44. Origin of most of the mineral coal deposits can be traced to :
- (A) cambrian period of palaeozoic era
 - (B) carboniferous period of palaeozoic era
 - (C) triassic period of mesozoic era
 - (D) upper cretaceous period of mesozoic era
45. An animal confronted with conflicting situation exhibits :
- (A) empimeletic behaviour
 - (B) eleminative behaviour
 - (C) agonistic behaviour
 - (D) exploratory behaviour

46. Citric acid is produced by :
- (A) *Aspergillus niger* (B) *Aspergillus oryzae*
(C) *Aspergillus fumigatus* (D) *Aspergillus nodulans*
47. The enzyme used in glucose biosensor is :
- (A) glucose hydrogenase (B) glucose isomerase
(C) glucose oxydase (D) endogluconase
48. ESR spectroscopy was used in the determination of the mechanism of enzyme catalyzed reaction :
- (A) adenosine deaminase
(B) thymidylate synthetase
(C) adenosine phosphoribosyl transferase
(D) ribonucleotide reductase
49. Which one of the following techniques is *not* useful in determining the single nucleotide polymorphism ?
- (A) SSCP (B) DNA fingerprinting
(C) AFLP (D) RFLP
50. If 30 silver coins and 6 gold coins of the same size and weight are mixed, one coin is drawn blindly and not replaced followed by another coin drawn in the same manner. What are the chances that both will be gold coins ?
- (A) about 12% (B) about 22%
(C) about 31% (D) about 39%

ROUGH WORK