Test Booklet No.
प्रश्नपत्रिका क्र. **F**

Paper-II
LIFE SCIENCE

Signature and Name of Invigilator

1. (Signature) .....

(Name) .....

2. (Signature) .....

(Name) .....

Seat No. | | | | | | |

(In figures as in Admit Card)

Seat No. .....

(In words)

OMR Sheet No. | | | | | | |

(To be filled by the Candidate)

AUG - 34215

Time Allowed : 1¼ Hours] **[Maximum Marks : 100**

Number of Pages in this Booklet : **16** Number of Questions in this Booklet : **50**

Instructions for the Candidates

1. Write your Seat No. and OMR Sheet No. in the space provided on the top of this page.
2. This paper consists of **50** objective type questions. Each question will carry *two* marks. *All* questions of Paper-II will be compulsory, covering entire syllabus (including all electives, without options).
3. At the commencement of examination, the question booklet will be given to the student. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as follows :
   (*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 or 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 missing pages/ questions or questions repeated or not in serial order or any other discrepancy should not be accepted and correct booklet should be obtained from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given. The same may please be noted.**
   (*iii*) After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.
4. Each question has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.
   Example : where (C) is the correct response.

   (A) (B) ● (D)

5. Your responses to the items are to be indicated in the **OMR Sheet given inside the Booklet only.** If you mark at any place other than in the circle in the OMR Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done at the end of this booklet.
8. If you write your Name, Seat Number, Phone Number or put any mark on any part of the OMR 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, you will render yourself liable to disqualification.
9. You have to return original OMR 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 the Test Booklet and duplicate copy of OMR 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 is no negative marking for incorrect answers.**

विद्यार्थ्यांसाठी महत्त्वाच्या सूचना

1. परिक्षार्थींनी आपला आसन क्रमांक या पृष्ठावरील वरच्या कोपऱ्यात लिहावा. तसेच आपणांस दिलेल्या उत्तरपत्रिकेचा क्रमांक त्याखाली लिहावा.
2. सदर प्रश्नपत्रिकेत **50** बहुपर्यायी प्रश्न आहेत. प्रत्येक प्रश्नास **दोन** गुण आहेत. या प्रश्नपत्रिकेतील **सर्व** प्रश्न सोडविणे अनिवार्य आहे. सदरचे प्रश्न हे या विषयाच्या संपूर्ण अभ्यासक्रमावर आधारित आहेत.
3. परीक्षा सुरू झाल्यावर विद्यार्थ्याला प्रश्नपत्रिका दिली जाईल. सुरुवातीच्या 5 मिनीटांमध्ये आपण सदर प्रश्नपत्रिका उघडून खालील बाबी अवश्य तपासून पहाव्यात.
   (*i*) प्रश्नपत्रिका उघडण्यासाठी प्रश्नपत्रिकेवर लावलेले सील उघडावे. सील नसलेली किंवा सील उघडलेली प्रश्नपत्रिका स्विकारू नये.
   (*ii*) **पहिल्या पृष्ठावर नमूद केल्याप्रमाणे प्रश्नपत्रिकेची एकूण पृष्ठे तसेच प्रश्नपत्रिकेतील एकूण प्रश्नांची संख्या पडताळून पहावी. पृष्ठे कमी असलेली/कमी प्रश्न असलेली/प्रश्नांचा चूकीचा क्रम असलेली किंवा इतर त्रुटी असलेली सदोष प्रश्नपत्रिका सुरुवातीच्या 5 मिनिटातच पर्यवेक्षकाला परत देऊन दुसरी प्रश्नपत्रिका मागवून घ्यावी. त्यानंतर प्रश्नपत्रिका बदलून मिळणार नाही तसेच वेळही वाढवून मिळणार नाही याची कृपया विद्यार्थ्यांनी नोंद घ्यावी.**
   (*iii*) वरीलप्रमाणे सर्व पडताळून पहिल्यानंतरच प्रश्नपत्रिकेवर ओ.एम.आर. उत्तरपत्रिकेचा नंबर लिहावा.
4. प्रत्येक प्रश्नासाठी (A), (B), (C) आणि (D) अशी चार विकल्प उत्तरे दिली आहेत. त्यातील योग्य उत्तराचा रकाना खाली दर्शविल्याप्रमाणे ठळकपणे काळा/निळा करावा.
   उदा. : जर (C) हे योग्य उत्तर असेल तर.

   (A) (B) ● (D)

5. या प्रश्नपत्रिकेतील प्रश्नांची उत्तरे **ओ.एम.आर. उत्तरपत्रिकेतच दर्शवावीत.** इतर ठिकाणी लिहीलेली उत्तरे तपासली जाणार नाहीत.
6. आत दिलेल्या सूचना काळजीपूर्वक वाचाव्यात.
7. प्रश्नपत्रिकेच्या शेवटी जोडलेल्या कोऱ्या पानावरच कच्चे काम करावे.
8. जर आपण ओ.एम.आर. वर नमूद केलेल्या ठिकाणा व्यतिरीक्त इतर कोठेही नाव, आसन क्रमांक, फोन नंबर किंवा ओळख पटेल अशी कोणतीही खूण केलेली आढळून आल्यास अथवा असभ्य भाषेचा वापर किंवा इतर गैरमार्गाचा अवलंब केल्यास विद्यार्थ्याला परीक्षेस अपात्र ठरविण्यात येईल.
9. परीक्षा संपल्यानंतर विद्यार्थ्याने मूळ ओ.एम.आर. उत्तरपत्रिका पर्यवेक्षकांकडे परत करणे आवश्यक आहे. तथापी, प्रश्नपत्रिका व ओ.एम.आर. उत्तरपत्रिकेची द्वितीय प्रत आपल्याबरोबर नेण्यास विद्यार्थ्यांना परवानगी आहे.
10. **फक्त निळ्या किंवा काळ्या बॉल पेनचाच वापर करावा.**
11. **कॅलक्युलेटर किंवा लॉग टेबल वापरण्यास परवानगी नाही.**
12. **चुकीच्या उत्तरासाठी गुण कपात केली जाणार नाही.**

Life Science

Paper II

Time Allowed : 75 Minutes] **[Maximum Marks : 100**

Note : This paper contains **50** multiple choice questions, each carrying **Two (2)** marks. Attempt *All* questions.

1. Dosage compensation in mammals is :

   (A) Heterochromatinisation of one X-chromosome in females

   (B) Hyperactivation of single X-chromosome in males

   (C) Hyperactivation of Y-chromosome in males

   (D) Equalisation of transcription from both X and Y-chromosome in males

2. Which one of the following is an example of heterogametic females ?

   (A) Drosophila

   (B) Moths

   (C) Human

   (D) 7 O'clock plant

3. Star shaped basic cell morphology have been observed in :

   (A) Protozoa

   (B) Yeast

   (C) Eubacteria

   (D) Algae

4. Which of the following is *not* an isotypic determinant ?

(A) Ig G1

(B) Ig G2

(C) Ig G2m

(D) Ig G3

5. Transport of molecules through a cell membrane down a concentration gradient mediated by a membrane transport protein is called as :

(A) Symporter

(B) Antiporter

(C) Uniporter

(D) Transporter

6. Metastasis of cancer cells during malignant growth of tumors depends on which of the following enzymes ?

(A) Trypsin

(B) Chymotrypsin

(C) Lipase

(D) Matrix metalloprotease

7. Which one of the following proteins is MAP Kinase Kinase Kinase (MAP KKK) ?

(A) c-RAS

(B) GAP

(C) SoS

(D) C-Raf

8. Which of the following is *not* a component of membrane phospholipid, lecithin ?

(A) Glycerol

(B) Choline

(C) Sphingosine

(D) Fatty acid

9. Which shuttle is operated to get 32 ATP molecule after complete oxidation of glucose ?

(A) Glycerol-3-phosphate

(B) Malate-aspartate

(C) Pyruvate-malate

(D) Citrate-pyruvate

10. Which of the following high energy compound releases maximum amount of energy on hydrolysis ?

(A) ATP

(B) 1, 3 bis-phosphoglycerate

(C) Creatine phosphate

(D) Phosphoenol pyruvate

11. During translation, formyl-methionine and methionine, as an initiator amino acid, is distinguished from any internal methionine by :

(A) initiation codon *versus* internal codon

(B) initiation factor *versus* elongation factor

(C) small subunit of ribosome *versus* large subunit of ribosome

(D) ATP *versus* GTP

12. Silk fibroin displays ..... structure.

(A) α-helix

(B) loop

(C) parallel β-sheet

(D) antiparallel β-sheet

13. What is the role of peptidoglycan ?

(A) extracellular adhesive

(B) gives rigidity and strength to exoskeletons

(C) gives rigidity and strength to cell envelope

(D) energy storage

14. In a highly acidic solution (pH = 1.3) the amino acid glycine exists in :

(A) $\overset{+}{N}H_3 - CH_2 - COO^-$

(B) $\overset{+}{N}H_3 - CH_2 - COOH$

(C) $NH_2 - CH_2 - COOH$

(D) $NH_2 - CH_2 - COO^-$

15. Among the following which is the protein carrier molecule linking PS-II and PS-I in photosynthesis ?

(A) Plastocyanin

(B) Ferredoxin

(C) Pheophytin

(D) Plastoquinone

16. Which of the following has greater affinity for haemoglobin ?

(A) Carbon monoxide

(B) Carbon dioxide

(C) Oxygen

(D) Nitrogen

17. A precursor is converted by ultraviolet radiation into a molecule. The molecule is likely to be :

(A) Vitamin C

(B) Vitamin K

(C) Vitamin A

(D) Vitamin D

18. The deglutition centre is located in the :

(A) Lumbar spinal cord

(B) Cerebral cortex

(C) Medulla oblongata

(D) Lateral hypothalamus

19. Which of the following statements is *incorrect* for normal cells ?

(A) Intracellular potential of only the neurones is negative in comparison with the extracellular potential

(B) Extracellular potential is always positive compared to the intracellular potential of all cells

(C) Intracellular compartment contains more of potassium ions than the extracellular compartment

(D) Extracellular compartment contains more of sodium ions than the intracellular compartment

20. The oxygen atoms in the water molecules formed in glucose oxidation according to the equation : $C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O$ come :

(A) entirely from glucose

(B) entirely from respiratory oxygen

(C) equally from respiratory oxygen and glucose

(D) from glucose and respiratory oxygen in 1 : 3 ratio

21. The control of cell elongation in the *Arabidopsis* hypocotyl by light and gibberellic acid represents an example of :

(A) secondary cross-regulation

(B) positive primary cross-regulation

(C) negative primary cross-regulation

(D) Tertiary cross-regulation

22. The functional allele of a gene that predominates in the population of an organism is called ..... allele.

(A) Wild-type

(B) Recessive

(C) Multiple

(D) Epistatic

23. Which of the following DNA sequences is present in telomeres of human chromosomes ?

(A) 5' TTA GGG 3'

(B) 5' GGG TTA 3'

(C) 5' CCA GGG 3'

(D) 5' CCC AAT 3'

24. RNA polymerase I is located in ..... .

(A) Nucleus

(B) Nucleolus

(C) Matrix

(D) *mt*DNA

25. Map distance between genes in a genetic map is determined by :

(A) Gene gap

(B) Rate of recombination between genes

(C) Percent of independent assortment

(D) Linkage relationship

26. Xeroderma pigmentosum can be repaired by :

(A) Mismatch repair

(B) Nucleotide excision repair

(C) Base excision repair

(D) Direct repair

27. In somatic cell hybrid generation involving use of human and chinese hamster ovary cells :

(A) Human chromosomes get eliminated

(B) Human chromosomes get rearranged

(C) Chromosomes of chinese hamster ovary cells get eliminated

(D) Chromosomes of chinese hamster ovary cells undergo translocations

28. Patau syndrome is due to :

(A) Trisomy of chromosome 13

(B) Trisomy of chromosome 18

(C) Trisomy of chromosome 21

(D) Robertsonian translocation

29. Constitutive heterochromatin is mostly :

(A) Repetitive DNA

(B) Devoid of repetitive sequence

(C) Varies in different cell types

(D) Express differently at different developmental stages

30. The centre of origin of groundnut is :

(A) North-East Asia

(B) South-East Asia

(C) South America

(D) Brazil

31. Formation of new species through geographic isolation and prevention of gene flow is known as ..... speciation.

(A) Sympatric

(B) Allelopatric

(C) Allopatric

(D) Isopatric

32. How is extinction depicted in a cladistic phylogenetic tree diagram ?

(A) A branch splits

(B) A branch ends

(C) A brach shifts along the X-axis

(D) A branch shifts along the Y-axis

33. Which of the following exhibits the most fit individual in an evolutionary sense ?

(A) A tiger who is successful at capturing prey but has no cubs

(B) A tiger who has ten cubs, eight of which live to adulthood

(C) A tiger who overcomes a disease and lives to have three cubs

(D) A tiger who shows parental care for his cubs but only two live to adulthood

34. Miller and Urey performed an experiment to prove origin of life. They took gases NH_3 and H_2 along with ..... .

(A) N_2 and H_2O

(B) H_2O and CH_4

(C) CO_2 and N_2

(D) CH_4 and N_2

35. In a population, balancing selection is accomplished through successful reproduction of :

(A) homozygous recessive individuals

(B) homozygous dominant individuals

(C) heterozygous individuals

(D) hemizygous individuals

36. In a large randomly mating population only four percent of the individuals shows a recessive trait. What will be the frequency of carriers in the following generation ?

(A) 8%

(B) 64%

(C) 16%

(D) 32%

37. Eutrophication causes a reduction of ..... in the water body.

(A) Carbon dioxide

(B) Oxygen

(C) Nitrogen

(D) Sulphur dioxide

38. Deforestation generally causes a decrease in :

(A) Rainfall

(B) Drought

(C) Soil erosion

(D) Global warming

39. Which of the following will ensure diversity of wild flora ?

(A) Monoculture of forest plant species

(B) Polyculture of native plant species

(C) Introduction of new plant species

(D) Transplantation of trees

40. The purpose of Rio Declaration on Environment and Development is to promote :

(A) Wildlife protection around the world

(B) Optimal utilization of resources

(C) Sustainable development around the world

(D) Propagation of evergreen forests in the tropics

41. Kelameru Bird Sanctuary is well known :

(A) For pelicans and other marine birds

(B) As a transit area for migratory ducks

(C) For presence of a large number of peafowls

(D) As a breeding ground for marine turtles

42. Peroxylacetyl Nitrate (PAN) is a product of :

(A) Acid rain

(B) Chlorofluorocarbon + sulphur dioxide

(C) Depletion of oxygen

(D) Synergistic effect of photochemical smog

43. The source of turmeric is :

(A) *Crocus sativus* Linn.

(B) *Curcuma longa* Linn.

(C) Cuminum cyminum Linn.

(D) *Curculigo orchioides* Gaertn.

44. Which of the following has highest percentage of endangered plant species ?

(A) Conifers

(B) Cycads

(C) Cacti

(D) Ferns

45. Which of the following genes are used in molecular systematics ?

(A) Nuclear ribosomal genes

(B) House-keeping genes

(C) Telomere genes

(D) Structural genes

46. If a structure in an organism evolves in different lineages, so that it is possessed by several species although it was not found in their most recent common ancestors then it exhibits :

(A) Analogy

(B) Homology

(C) Epistemology

(D) Homoplasy

47. Which of the following exhibits maximum diversity of animals and plants ?

(A) Coral reefs

(B) Mangroves

(C) Tropical rain forest

(D) Tundra

48. Which of the following is *not* included under *in-situ* conservation ?

(A) Tiger reserves

(B) National parks

(C) Botanical gardens

(D) Sanctuaries

49. DNA fingerprinting uses variation in :

(A) Satellite DNA

(B) Retrotransposons

(C) SNPs

(D) Intron length

50. The most important cause of decrease in biodiversity on our planet is :

(A) Habitat destruction

(B) Habitat pollution

(C) Introduction of exotic species

(D) Over-exploitation of renewable resources

ROUGH WORK