

Test Booklet No.

प्रश्नपत्रिका क्र.

**F**

## Paper-II

### LIFE SCIENCES

Signature and Name of Invigilator

Seat No.

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(In figures as in Admit Card)

1. (Signature) .....

(Name) .....

Seat No. ....

(In words)

2. (Signature) .....

(Name) .....

OMR Sheet No.

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(To be filled by the Candidate)

**DEC - 34213****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**

- Write your Seat No. and OMR Sheet No. in the space provided on the top of this page.
- 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).
- 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 :
  - 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.
  - 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.**
  - After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.
- 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)	(C)	(D)
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- 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.
- Read instructions given inside carefully.
- Rough Work is to be done at the end of this booklet.
- 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.
- 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.
- Use only Blue/Black Ball point pen.**
- Use of any calculator or log table, etc., is prohibited.**
- There is no negative marking for incorrect answers.**

**विद्यार्थ्यांसाठी महत्त्वाच्या सूचना**

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

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

**DEC - 34213/II**

**Life Sciences**  
**Paper II**

**Time Allowed : 75 Minutes]**

**[Maximum Marks : 100**

**Note :** This Paper contains **Fifty (50)** multiple choice questions, each question carries **Two (2)** marks. Attempt *All* questions.

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|---|--|
| <p>1. In a tissue, cells interact through a structure is called :</p> <p>(A) Hemi-desmosomes</p> <p>(B) Desmosomes</p> <p>(C) Desmoplakin</p> <p>(D) Gap junction</p> <p>2. Immunoglobulin heavy and light chains undergo structural modifications after antigen stimulation is called :</p> <p>(A) hypermutation</p> <p>(B) somatic recombination</p> <p>(C) somatic mutation</p> <p>(D) allelic exclusion</p> | <p>3. Which of the sub-classes of antibodies are found in blood serum and secretions ?</p> <p>(A) IgG<sub>1</sub>, IgG<sub>4</sub></p> <p>(B) IgG<sub>2</sub>, IgG<sub>3</sub></p> <p>(C) IgA<sub>1</sub>, IgA<sub>2</sub></p> <p>(D) IgG<sub>1</sub>, IgG<sub>3</sub></p> <p>4. The membrane enclosing the main vacuole of a cell is termed :</p> <p>(A) tonoplast</p> <p>(B) chloroplast</p> <p>(C) amyloplast</p> <p>(D) elaioplast</p> |
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5. Maturation promoting factor (MPF) of oocytes is also known as mitosis promoting factor. Which of the following represents MPF ?
- (A) Cyclin A—cdk 1
  - (B) Cyclin B—cdk 4
  - (C) Cyclin B—cdk 1
  - (D) Cyclin D—cdk 6
6. Which of the following intermediate filament proteins is present in animal cells ?
- (A) Desmin
  - (B) Vimentin
  - (C) Lamin
  - (D) Keratin
7. Dosage compensation in *Drosophila* is characterized by :
- (A) alteration of transcription rates of X chromosome in male
  - (B) heterochromatinization of X chromosome in female
  - (C) absence of chromocenter in males
  - (D) induction of puffs on polytene chromosomes
8. In bacterial protein synthesis, the initiating amino acid is :
- (A) N-formyl methionine
  - (B) Methionine
  - (C) Glutamic acid
  - (D) Cysteine

9. In *Escherichia coli* the trp operon is regulated by :
- (A) Attenuation
  - (B) Repression
  - (C) Induction
  - (D) Attenuation and repression
10. DNA and RNA synthesis differs from each other with respect to the requirement of :
- (A) Template
  - (B) Polymerase
  - (C) Primer
  - (D) Phosphodiester bond formation
11. Which of the following fatty acid is a precursor for prostaglandin biosynthesis ?
- (A) Arachidonic acid
  - (B) Valeric acid
  - (C) Palmitic acid
  - (D) Linolenic acid
12. What will be the pH of acetate-acetic acid buffer, when the ratio of [acetate]/[acetic acid] is 10 ? (Given  $pK_a = 4.76$ )
- (A) 3.76
  - (B) 4.76
  - (C) 5.76
  - (D) 2.76

13. During amino acid metabolism amino groups are excreted in mammals in the form of :
- (A) Ammonia
  - (B) Urea
  - (C) Uric acid
  - (D) Glutamate
14. Which of the following coenzymes is *not* involved in group transfer ?
- (A) Lipoic acid
  - (B) TPP
  - (C) Coenzyme A
  - (D) NAD<sup>+</sup>
15. Xerophthalmia is caused by deficiency of :
- (A) Vitamin A
  - (B) Vitamin D
  - (C) Vitamin K
  - (D) Vitamin C
16. Which of the following terms is used for the salt tolerant plants genetically adapted to salinity ?
- (A) Glycophytes
  - (B) Halophytes
  - (C) Mesophytes
  - (D) Hydrophytes
17. The pH of acid in stomach can be lowered by using ..... pump.
- (A) Gastric Na<sup>+</sup>/K<sup>+</sup> ATPase
  - (B) Gastric H<sup>+</sup>/K<sup>+</sup> ATPase
  - (C) Calcium ATPase
  - (D) Lactose permease
18. Cyclic GMP is a secondary messenger for :
- (A) atrial natriuretic hormone
  - (B) parathormone
  - (C) somatostatin
  - (D) prolactin

19. During seed development, embryo becomes tolerant to dessication and the seed dehydrates due to the presence of :
- (A) Indole acetic acid
  - (B) Kinetin
  - (C) Polyamines
  - (D) Absciscic acid
20. Which of the following is *not* a feature of magetotactic bacteria ?
- (A) Have magnetosomes containing  $\text{Fe}_3\text{O}_4$  or  $\text{Fe}_3\text{S}_4$
  - (B) Are motile, gram negative
  - (C) Are highly aerobic
  - (D) Have magnetosomes arranged linearly across long axis of the cell
21. Which of the following statements about fertilization is wrong ?
- (A) It restores diploid chromosomal number
  - (B) It results in formation of the first polar body
  - (C) Polyspermy is prevented by the zona reaction
  - (D) It determines the genetic sex of the zygote
22. A human male carrying an allele for a trait on the X chromosome is :
- (A) hemizygous
  - (B) homozygous
  - (C) heterozygous
  - (D) monozygous

23. In X-linked recessive inheritance :
- (A) most affected individuals are female
  - (B) the trait does not skip generations
  - (C) the daughters of affected father should be affected
  - (D) the sons of affected females should be affected
24. The common type of duplication generates :
- (A) a second copy of the gene in close proximity of the first copy
  - (B) a second copy of the gene in a distant location on a same chromosome
  - (C) a second copy of the gene on a different chromosome
  - (D) any of the above situations with equal probability
25. Satellite DNAs are not typically found within which of the following parts of a chromosome ?
- (A) Heterochromatin
  - (B) Euchromatin
  - (C) Telomeres
  - (D) Centromeres
26. In a paternity dispute a woman with blood group AB claimed that one of four men, each with different blood types, was the father of her child. If the blood group of child is A then the blood group of the father can be :
- (A) A
  - (B) A or O
  - (C) B
  - (D) A, B, O, AB



27. A hypothetical organism has six chromosomes ( $2n = 6$ ). How many different combinations of maternal and paternal chromosomes can appear in the gametes ?
- (A) 8  
(B) 12  
(C) 36  
(D) 6
28. Silent mutation :
- (A) creates a premature stop codon  
(B) substitutes one amino acid for a different amino acid with similar properties so it does not affect protein function  
(C) changes only one DNA base in a codon without changing the amino acid sequence  
(D) occurs outside protein coding region in the 5' and 3' untranslated region and thus does not affect protein function
29. Which one of the following is a deuterostome phylum ?
- (A) Porifera  
(B) Cnidaria  
(C) Mollusca  
(D) Hemichordata
30. The "Serial Endosymbiosis" theory was proposed by :
- (A) Alfred Wegener  
(B) Thomas Cavalier-Smith  
(C) Lynn Margulis  
(D) Robert Whittaker

31. The “thermal proteinoid” theory explaining the origin of life was proposed by :

- (A) Woese, Crick and Orgel
- (B) Sidney Fox
- (C) Stanley Miller and Harold Urey
- (D) David Deame and Joan Oro

32. A species inhabiting different geographical areas is called :

- (A) sibling species
- (B) ecotypes
- (C) sympatric
- (D) allopatric

33. In a genetically polymorphic population, balancing selection is concerned with successful reproduction of ..... individuals.

- (A) homozygous recessive
- (B) heterozygous
- (C) homozygous dominant
- (D) both homozygous recessive and dominant

34. During evolution, genetic drift occurs in a :

- (A) Mendelian population
- (B) Large population
- (C) Large population in an island
- (D) Small population

35. The population genetic models that show how genetic variation is retained in Mendelian inheritance was proposed by :

- (A) Hardy and Weinberg
- (B) Darwin
- (C) Kimura
- (D) Wallace

36. Mangroves are ecologically important because :

- (A) They are evergreen
- (B) They provide nurseries for many marine organisms
- (C) They harbour mosquitoes and spread diseases
- (D) They are medicinally useful

37. Ozone pollution is indicated by leaves of plants in the form of :

- (A) Intercostal bronzing
- (B) Minute chlorotic dots
- (C) Tip and margins browning
- (D) Watery film on epidermis

38. The growth curve of a species flattening into a plateau of population indicates :

- (A) Decrease of growth rate
- (B) Equality of growth and death rates
- (C) Increase in death rate
- (D) Progress of the species towards extinction

39. Presence of *Escherichia coli* in water

indicates :

- (A) Faecal pollution
- (B) Chemicals in water
- (C) Pesticides in water
- (D) Oil pollution

40. Aquatic ecosystems are of two types :

lentic and lotic. Which one of the following is *not* lotic ?

- (A) Stream
- (B) River
- (C) Flowing water
- (D) Lake

41. A phosphate cycle is known as cycle of a limiting nutrient in nature.

Phosphate is made available to biotic components of an ecosystem

by :

- (A) water
- (B) rocks and soil
- (C) biological fixation
- (D) a symbiotic process

42. Acid rain is caused due to which of the following air pollutants :

- (A) Oxides of nitrogen
- (B) Sulfur dioxide
- (C) Carbon dioxide
- (D) Oxides of nitrogen and sulfur dioxide

43. The microorganism involved in making of blue cheese is :

- (A) *Pseudomonas aeruginosa*
- (B) *Blue Green cyanobacteria*
- (C) *Penicillium roquetortii*
- (D) *Aspergillus flavus*

44. Which of the following represents a direct use of biodiversity ?

- (A) Nutrient cycling
- (B) Pest-control
- (C) Photosynthesis
- (D) Biological control

45. A lineage which occupies an adaptive zone which is different in some ways from any other lineage in its range and which evolves separately from all lineages outside its range denotes :

- (A) Biological species
- (B) Recognition species
- (C) Ecological species
- (D) Phylogenetic species

46. Ramsar Convention on Wetlands of International Importance was adopted in :

- (A) 1987
- (B) 1981
- (C) 1971
- (D) 1970

47. Gulf of Mannar and Nilgiris in India

are :

- (A) Biosphere Reserves
- (B) Sanctuaries
- (C) World Heritage Sites
- (D) National Zoological Parks

48. Characteristics that have arisen as

a result of common evolutionary descent are said to be :

- (A) analogous
- (B) heterologous
- (C) homogeneous
- (D) homologous

49. A group of organisms at any particular level in a system of classification is called a :

- (A) Species
- (B) Genus
- (C) Taxon
- (D) Class

50. Certain responses in bacteria are

strictly dependent upon microbial population size. This is described as :

- (A) Quorum sensing behaviour
- (B) Social behaviour
- (C) Growth-controlling behaviour
- (D) Chemotactic behaviour

**DEC - 34213/II**

**ROUGH WORK**

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