

Test Booklet Code & Serial No.

प्रश्नपत्रिका कोड व क्रमांक

A

Paper-II

LIFE SCIENCE

Signature and Name of Invigilator

Seat No.

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1. (Signature)

(In figures as in Admit Card)

(Name)

Seat No.

(In words)

2. (Signature)

(Name)

OMR Sheet No.

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(To be filled by the Candidate)

APR - 34217**Time Allowed : 1¼ Hours]****[Maximum Marks : 100****Number of Pages in this Booklet : 12****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 महत्वाच्या सूचना

- परिक्षार्थींनी आपला आसन क्रमांक या पृष्ठावरील वरच्या कोपऱ्यात लिहावा. तसेच आपणांस दिलेल्या उत्तरपत्रिकेचा क्रमांक त्याखाली लिहावा.
- 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.
- परीक्षा सुरू झाल्यावर विद्यार्थ्यांना प्रश्नपत्रिका दिली जाईल. सुरुवातीच्या 5 मिनीटांमध्ये आपण सदर प्रश्नपत्रिका उघडून खालील बाबी अवश्य तपासून घ्याव्यात.
 - 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 घ्यावी. 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 वेळही 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 काळ/निळ्या करवावा.
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 लिहीलेली 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 व्यतिरिक्त इतर कोठेही नाव, आसन क्रमांक, फोन नंबर किंवा ओळख पटेल अशी कोणतीही खुण केलेली आढळून आल्यास अथवा असभ्य भाषेचा वापर किंवा इतर गैरमागीचा अवलंब केल्यास विद्यार्थ्यांना परीक्षेस अपात्र ठरविण्यात येईल.
- परीक्षा संपल्यानंतर विद्यार्थ्यांनी 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.

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Life Science

Paper II

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

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

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| <p>1. During a growth curve of <i>Aliivibrio fischeri</i>, when would you expect to see the strongest bioluminescence ?</p> <p>(A) Lag phase</p> <p>(B) Early to middle log phase</p> <p>(C) Late log to early stationary phase</p> <p>(D) Middle to late stationary phase</p> <p>2. Aquaporins are associated with :</p> <p>(A) Ribosomes</p> <p>(B) Nuclear membrane</p> <p>(C) Cell membrane</p> <p>(D) Rough endoplasmic reticulum</p> <p>3. Accessory chromosomes are found in :</p> <p>(A) All plants</p> <p>(B) All animals</p> <p>(C) All plants and in few animals</p> <p>(D) Only in some eukaryotic organisms</p> | <p>4. Which one among the following is responsible for dosage compensation in female mammals ?</p> <p>(A) Inactivation of one set of autosomes in both males and females.</p> <p>(B) Inactivation of one of the X-chromosomes in females.</p> <p>(C) Inactivation of Y-chromosome.</p> <p>(D) Inactivation of X-chromosome in males.</p> <p>5. In the antigen antibody reaction the association constant (K_a) at equilibrium is represented by :</p> <p>(A) $[Ag\ Ab\ complex]$</p> <p>(B) $[Free\ Ag]\ [Free\ Ab]$</p> <p>(C) $[Free\ Ag]\ [Free\ Ab]/[Ag\ Ab\ complex]$</p> <p>(D) $[Ag\ Ab\ complex]/[Free\ Ag]\ [Free\ Ab]$</p> |
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| <p>6. A <i>Drosophila</i> fly with only one X chromosome (XO condition) in the absence of Y chromosome will develop as :</p> <p>(A) Female</p> <p>(B) Male</p> <p>(C) Meta-male</p> <p>(D) Intersex</p> <p>7. The embryonic stage in frog in which differentiation of mesoderm takes place is called :</p> <p>(A) Blastula</p> <p>(B) Gastrula</p> <p>(C) Morula</p> <p>(D) Neurula</p> <p>8. Mitosis Promoting Factor (MPF) is composed of :</p> <p>(A) Cyclin D and CDK</p> <p>(B) Cyclin B and CDK</p> <p>(C) Cyclin E and CDK</p> <p>(D) Cyclin A, CDK and Wee 1</p> | <p>9. Junctional diversity affects primarily the amino acid sequence in :</p> <p>(A) All CDRs equally</p> <p>(B) CDR1</p> <p>(C) CDR2</p> <p>(D) CDR3</p> <p>10. In prokaryotes, the specificity of RNA polymerase is determined by the</p> <p>(A) Core enzyme</p> <p>(B) Omega subunit</p> <p>(C) Sigma subunit</p> <p>(D) α subunit</p> <p>11. Chlorophyll is an effective photoreceptor pigment. This property of chlorophyll is due to :</p> <p>(A) Magnesium in chlorophyll</p> <p>(B) Nitrogen in chlorophyll</p> <p>(C) Presence of polyene structure</p> <p>(D) Presence of accessory pigment</p> |
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12. Polypeptides can be fragmented by using chemical treatment before amino acid sequencing of a given protein. Cyanogen bromide is one such reagent and its specific cleavage site is :
- (A) carboxyl side of lysine and arginine residues
 - (B) carboxyl side of arginine residues
 - (C) carboxyl side of methionine residues
 - (D) carboxyl side of aspartate and glutamate residues
13. In photosynthesis, the reaction between ribulose 1, 5,- biphosphate and oxygen catalysed by enzyme RUBISCO results in formation of
- (A) 3, phosphoglycerate and glyoxylate
 - (B) Glyoxylate and dihydroxyacetone phosphate
 - (C) 2, phosphoglycolate and 3, phosphoglycerate
 - (D) Dihydroxyacetone phosphate and 2 phosphoglycolate.
14. When a weak acid is mixed with its salt, pH of the solution becomes :
- (A) More acidic
 - (B) Remains same
 - (C) Neutral
 - (D) Less acidic
15. p-Aminobenzoate (pABA) is an important building block of :
- (A) Lipoate
 - (B) Tetrahydrofolate
 - (C) Biotin
 - (D) S-Adenosylmethionine
16. Raffinose is a carbohydrate and a minor constituent of sugar beets. Which class of carbohydrates from below does it belong to ?
- (A) Monosaccharide
 - (B) Disaccharide
 - (C) Trisaccharide
 - (D) Polysaccharide

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17. Which of the following is considered presence of carpels with style and stigma as characteristic feature of angiosperms ?
- (A) Carl Linnaeus
- (B) George Bentham
- (C) J.D. Hooker
- (D) Armon Takhtajan
18. Polyembryony is reported in the :
- (A) Mango
- (B) Wheat
- (C) Jowar
- (D) Ragi
19. Phytochelatins are low-molecular-weight thiols consisting of the :
- (A) Organic acids
- (B) Amino acids
- (C) Fatty acids
- (D) Nucleic acids
20. In a normal mammalian kidney, the hypertonicity of the urine is usually a function of :
- (A) Glomerulus
- (B) Loop of Henle
- (C) Blood glucose level
- (D) Blood pressure
21. For maturation of somatic embryos there is need of :
- (A) ABA
- (B) GA3
- (C) Auxin
- (D) Kinetin
22. Water potential in plants is affected by :
- (A) Solute concentration
- (B) Hydrostatic pressure
- (C) Absorptive forces
- (D) All—Solute, Hydrostatic and Absorptive forces

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23. Gene transfer in bacteria enhances :
- (A) Genetic variability
 - (B) Adaptability
 - (C) Virulence
 - (D) Virulence, variability and adaptability
24. In human pointed eyebrows are dominant to smooth eyebrows and widow's-peak (downward pointed frontal hairline) is dominant to continuous hairline. What phenotypic ratio would you expect in the offspring from a cross between an individual heterozygous for both genes and an individual homozygous recessive for both genes ?
- (A) 12 : 3 : 1
 - (B) 9 : 3 : 4
 - (C) 1 : 1 : 1 : 1
 - (D) 1 : 2 : 1 : 2 : 1
25. Plasmids often encode for proteins that :
- (A) are involved in translation
 - (B) are involved in DNA replication
 - (C) are required for cellular growth
 - (D) confer resistance to antibiotics
26. A wild type chromosome represented as ABC * DEFGH after chromosomal aberration is represented as AED * CBFGH (* = centromere). This is called as :
- (A) Deletion
 - (B) Pericentric inversion
 - (C) Translocation
 - (D) Paracentric inversion
27. Which one of the following is *not* transposon ?
- (A) *Alu*
 - (B) *Copia*
 - (C) *amp-r*
 - (D) *gal*

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28. Which of the following genetic disorder *cannot* be diagnosed prenatally ?
- (A) Haemophilia
 - (B) Sickle-cell anemia
 - (C) Tay-Sachs disease
 - (D) Skin cancer
29. Mutations may be described as :
- (A) Continuous genetic variation
 - (B) Discontinuous genetic variation
 - (C) Phenotypic change
 - (D) Change due to hybridization
30. The theory of 'use and disuse' was proposed by :
- (A) de Vries
 - (B) Aristotle
 - (C) Lamarck
 - (D) Weismann
31. The first organisms to populate the earth are said to be :
- (A) Autotrophs
 - (B) Chemoautotrophs
 - (C) Cyanobacteria
 - (D) Chemoheterotrophs
32. Which of the following is *not* a biodiesel plant ?
- (A) *Euphorbia*
 - (B) *Eupatorium*
 - (C) *Pongamia*
 - (D) *Jatropha*
33. Which of the following is considered to be a separate species intermediate of *Homo erectus* and *Homo sapiens* ?
- (A) Java man
 - (B) Neanderthal man
 - (C) Cromagnon man
 - (D) Heidelberg man

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34. Geographical isolation leads to :
- (A) Parapatric speciation
 - (B) Sympatric speciation
 - (C) Allopatric speciation
 - (D) Bottle neck speciation
35. A trait that increases the reproductive success of an organism is :
- (A) Adaptation
 - (B) Benefit
 - (C) Essential element
 - (D) Fertility symbol
36. The genes are confined to the differential region of a Y chromosome.
- (A) autosomal
 - (B) holandric
 - (C) mutant
 - (D) sex-linked
37. Which of the following produces maximum number of antibiotics ?
- (A) *Aspergillus*
 - (B) *Penicillium*
 - (C) *Bacillus*
 - (D) *Streptomyces*
38. Sunken stomata are present in :
- (A) *Azadirachta* species
 - (B) *Mangifera* species
 - (C) *Citrus* species
 - (D) *Nerium* species
39. Different blood group types in humans may be attributed to :
- (A) Genetic polymorphism
 - (B) Natural selection
 - (C) Isolation
 - (D) Mutation

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40. At the origin of life, organic molecules would have been formed by :

- (A) Low pressure driven reactions
- (B) High pressure driven reactions
- (C) UV mediated linking of reduced carbon and nitrogen compounds
- (D) High temperature driven condensation of reduced carbon and nitrogen compounds

41. When speciation occurs due to physical barrier that divides a continuous population into fragmented population is termed as :

- (A) Parapatric speciation
- (B) Peripatric speciation
- (C) Sympatric speciation
- (D) Allopatric speciation

42. Which of the following is *not* true for balanced genetic polymorphism ?

- (A) In spite of selection pressure against homozygous recessive condition, there is no decline in allele frequency.
- (B) Allele frequency does not change in spite of increased fitness and reproductive success of heterozygous individuals.
- (C) The trend of the population is towards reduced phenotypic variation and maintenance of status quo.
- (D) Population favours variants of one type of individuals possessing extreme phenotype.

43. The population of is most likely to increase if a new producer organism is introduced into a food web.

- (A) Carnivores
- (B) Herbivores
- (C) Omnivores
- (D) Decomposers

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44. Red Data Book contains data of :
(A) Only plant species
(B) Only animal species
(C) Only endemic species
(D) Only threatened species
45. A protected geographical area declared as a..... is characterised by ecological, faunal, floral, geomorphological, natural or zoological significance.
(A) Wildlife sanctuary
(B) Biosphere
(C) National park
(D) Reserve forest
46. Cryopreservation is best done at a temperature ($^{\circ}\text{C}$) of :
(A) -96
(B) -130
(C) -196
(D) -215
47. Which of the following is irrelevant to loss of biological diversity ?
(A) Over-exploitation
(B) Pollution
(C) Habit loss
(D) Magnitude of Biodiversity
48. Among the readily available features of the organisms only those which are used for classificatory purposes and helpful in establishing grouping and distinction come under :
(A) Natural classification
(B) Omnispecific classification
(C) Phenetic classification
(D) Evolutionary classification
49. The name of a sub-species as per International Code for Zoological Nomenclature is :
(A) Uninomial
(B) Binomial
(C) Trinomial
(D) Polynomial
50. The term 'systematics' was proposed by :
(A) Robert Whittakar
(B) John Ray
(C) James Cook
(D) Theodore Cooke

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