



Previous Year Question Paper
of

SET – MAHARASHTRA
LIFE SCIENCES: Paper – II
State Eligibility Test

2018, January

(Original Question Paper with Answer Key)

State Eligibility Test



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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)

JAN - 34218

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 पृष्ठवरील 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 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 काळ/निळ्या 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 व्यतिरिक्त इतर कोठेही नाव, आसन क्रमांक, फोन नंबर किंवा ओळख पटेल अशी कोणतीही खुण केलेली आढळून आल्यास अथवा असभ्य भाषेचा वापर किंवा इतर गैरमार्गाचा अवलंब केल्यास विद्यार्थ्यांला 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.**
- कॅल्क्युलेटर किंवा लॉग टेबल वापरण्यास परवानगी नाही.**
- चुकीच्या उत्तरासाठी गुण कपात केली जाणार नाही.**

JAN - 34218/II—A

Life Science

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.

- | | |
|---|---|
| <p>1. Difference in chromosomal determination of sex between <i>Drosophila</i> and human is because :</p> <p>(A) In <i>Drosophila</i>, the ratio of X chromosome to autosome determines maleness or femaleness whereas in human, the Y chromosome determines maleness.</p> <p>(B) As seen in human, mere presence of two X chromosomes triggers female developmental pathway in <i>Drosophila</i>.</p> <p>(C) In both human and <i>Drosophila</i> the Y chromosome determines maleness</p> <p>(D) As seen in <i>Drosophila</i>, presence of single X chromosome in the absence of Y chromosome can trigger maleness in human.</p> | <p>2. Order of stages in cell cycle is :</p> <p>(A) S, G₁, G₂, M</p> <p>(B) M, G₁, G₂, S</p> <p>(C) G₁, S, G₂, M</p> <p>(D) G₂, M, S, G₁</p> <p>3. A bacterium is found to lack catalase, peroxidase and superoxide dismutase. Which of the following statements best describes this bacterium ?</p> <p>(A) This bacterium is highly virulent.</p> <p>(B) This bacterium does not produce superoxide.</p> <p>(C) This bacterium is an obligate anaerobe.</p> <p>(D) This bacterium is an obligate aerobe.</p> |
|---|---|

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4. Characteristics of intracellular receptors that regulate gene transcription include the following, *except* :
- (A) It has a DNA binding site.
 - (B) It has an extracellular ligand binding site.
 - (C) It may be signaled by lipid.
 - (D) It has a transcription activating domain.
5. Ac-Ds system in corn involves dissociation of gene located on :
- (A) 9th chromosome
 - (B) 5th chromosome
 - (C) 7th chromosome
 - (D) 13th chromosome
6. During mitosis, Anaphase promoting complex (APC) is involved in regulating :
- (A) Separation of sister chromatids only
 - (B) Separation of sister chromatids and exit from mitosis
 - (C) Formation of polar microtubules
 - (D) Formation of actin rings during cytokinesis
7. Wolffian lens regeneration in Amphibia is an example of :
- (A) Differentiation only
 - (B) De-differentiation only
 - (C) De-differentiation followed by proliferation
 - (D) Trans-differentiation

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8. Which among the following phenomena interferes with the balance theory of sex determination in *Drosophila* ?
- (A) Linkage
 - (B) Non-disjunction
 - (C) Crossing over
 - (D) Environmental
9. A Fab fragment :
- (A) is produced by pepsin treatment
 - (B) is produced by separation of heavy and light chains
 - (C) Binds antigen
 - (D) Lacks light chains
10. In prokaryotes, the sequence in mRNA that is recognized by the small subunit of ribosome during its translation is known as :
- (A) UAG sequence
 - (B) Shine-Dalgarno sequence
 - (C) Pribnow box sequence
 - (D) AUG sequence
11. If an aqueous solution has a hydrogen ion concentration of 10^{-3} M, what is the concentration of hydroxyl ion ?
- (A) 10^{-14} M
 - (B) 10^{-10} M
 - (C) 10^{-11} M
 - (D) 10^{-12} M
12. Which of the following pair of amino acids belong to the class of polar amino acids ?
- (A) Serine and asparagine
 - (B) Asparagine and alanine
 - (C) Serine and valine
 - (D) Valine and methionine
13. A non-protein amino acid canavanine, can be mistakenly incorporated in the place of..... into proteins.
- (A) Arginine
 - (B) Cysteine
 - (C) Methionine
 - (D) Glycine

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14. Which of the following molecules binds with greater affinity to calcium hydroxy apatite column ?
- (A) ATP
 - (B) RNA
 - (C) ss-DNA
 - (D) ds-DNA
15. Hydrogen bond can be formed between the pair of atoms such as :
- (A) Hydrogen and Carbon
 - (B) Hydrogen and Nitrogen
 - (C) Oxygen and Nitrogen
 - (D) Oxygen and Carbon
16. Biosynthetic pathway of which of the following amino acids is similar to purine biosynthesis ?
- (A) Proline
 - (B) Tryptophan
 - (C) Histidine
 - (D) Leucine
17. Budding is the chief mode of reproduction in :
- (A) Pipewarts
 - (B) Stonewarts
 - (C) Bladderwarts
 - (D) Duckweeds
18. The role of double fertilization in angiosperms is to produce :
- (A) Cotyledons
 - (B) Mesocarp
 - (C) Endosperm
 - (D) Endocarp
19. Cells can supercool to only about°C.
- (A) 0
 - (B) - 40
 - (C) - 80
 - (D) - 20

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20. Which one of the following is NOT a characteristic of Alzheimer's disease ?
- (A) Loss of cholinergic neurons
 - (B) Loss of memory
 - (C) Sleep is disturbed
 - (D) Increase in number of cholinergic neurons
21. During fruit ripening, one of main hormones playing an important role is :
- (A) Ethylene
 - (B) ABA
 - (C) Auxin
 - (D) Gibberellin
22. Apoplast transport of water in plants take place :
- (A) Through non-living portion of the plant
 - (B) Through living cells of the plant
 - (C) By both living and non-living portion of the plant
 - (D) Through plasmodesmata
23. Fluorescent dyes absorb light at one wavelength and emit it at another longer wavelength. This can be examined under :
- (A) Fluorescence Microscope
 - (B) Stereozoom Microscope
 - (C) Electron Microscope
 - (D) Dissecting Microscope
24. Which of the following represents triplet repeat disorder ?
- (A) Huntington's disease
 - (B) Cystic fibrosis
 - (C) Xeroderma pigmentosum
 - (D) Phenylketonuria
25. Polycistronic transcription units are common in :
- (A) Archae
 - (B) Bacteria
 - (C) Eukarya
 - (D) Both Archae and Bacteria

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26. What will be the frequency of AABB individuals from mating of two AaBb individuals ?
- (A) 1/64
 - (B) 1/16
 - (C) 1/4
 - (D) 3/16
27. Which of the following is a bypass to DNA damage repair system ?
- (A) Base excision repair
 - (B) SOS
 - (C) Nucleotide excision repair
 - (D) Homologous repair system
28. The phenotypic ratio obtained in F_2 is 2 : 1 in the progeny of cross due to presence of :
- (A) Dominant allele
 - (B) Recessive allele
 - (C) Lethal allele
 - (D) Co-dominant allele
29. The technique of radiocarbon dating has been used to estimate the age of fossilized life forms. What is the approximate half-life of carbon-14 ?
- (A) 550 years
 - (B) 5,500 years
 - (C) 55,000 years
 - (D) 5,50,000 years
30. Lamarck's theory of organic evolution is popularly known as :
- (A) Inheritance of acquired characters
 - (B) Descent with change
 - (C) Continuity of germplasm
 - (D) Natural selection
31. The Sewall Wright effect occurs because of :
- (A) Mutation
 - (B) Decline in population
 - (C) Increase in population
 - (D) Variation

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32. Quinine, an anti-malarial drug is produced by which of the following plant ?
- (A) *Ephedra*
 - (B) *Rauwolfia*
 - (C) *Cinchona*
 - (D) *Podophyllum*
33. All the seemingly similar ancestors who are on the direct line of evolution of man are grouped into a single family Hominidae. All of the following belong to Hominidae, *except* :
- (A) Proconsul
 - (B) Australopithecus
 - (C) Ramapithecus
 - (D) Therapsids
34. A species inhabiting different geographical regions is known as :
- (A) Sympatric
 - (B) Allopatric
 - (C) Sibling
 - (D) Biospecies
35. Some traits are considered more important than others in :
- (A) Taxonomy
 - (B) Cladistics
 - (C) Phenetics
 - (D) Systematics
36. Supplemental nicotinamide or its analogue niacin relieves the dietary deficiency disease known as :
- (A) Pernicious anaemia
 - (B) Marasmus
 - (C) Megaloblastic anaemia
 - (D) Pellagra
37. Best example of a microbial insecticide is :
- (A) *B. subtilis*
 - (B) *B. polymyxa*
 - (C) *B. thuringensis*
 - (D) *B. lechiformis*

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38. Hotspots are the regions of :
- (A) Rarity
 - (B) Endemism
 - (C) Endangered species
 - (D) Diversity
39. Variation maintained in a population with Mendelian inheritance is explained by :
- (A) Natural selection theory
 - (B) Blending inheritance theory
 - (C) Hardy-Weinberg principle
 - (D) Spontaneous generation theory
40. Based on molecular evolution, which one of the following is close to humans ?
- (A) Orangutans
 - (B) Gibbons
 - (C) African apes
 - (D) Lemur
41. A directional process of species replacement over a period of time in a community is termed as :
- (A) Climate change
 - (B) Community change
 - (C) Competition
 - (D) Succession
42. Which of the following statements is NOT true ?
- (A) Directional selection shifts the overall make up of the population by favouring variants of one extreme.
 - (B) Stabilizing selection acts against extreme phenotypes.
 - (C) In diversifying selection, no extreme phenotypes are favoured.
 - (D) In stabilizing selection, genetic polymorphism is maintained.
43. The pond ecosystem is characterised by :
- (A) Inverted pyramid of biomass
 - (B) Inverted pyramid of numbers
 - (C) Upright pyramid of biomass
 - (D) Inverted pyramid of energy
44. Ecological studies of a population are known as :
- (A) Autecology
 - (B) Synecology
 - (C) Demecology
 - (D) Systematics

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45. What is the name of the First National Park of India established in 1936 ?
- (A) Kaziranga
 - (B) Ranthambore
 - (C) Jim Corbett
 - (D) Hailey
46. Cold sterilization refers to the preservation of food by :
- (A) Radiation
 - (B) Dehydration
 - (C) Lyophilization
 - (D) Refrigeration
47. Which of the following is not *ex-situ* conservation strategies ?
- (A) Botanical gardens
 - (B) National Park
 - (C) Zoos
 - (D) Seed Bank
48. The system based exclusively upon face of observed characters without direct reference to phylogeny is called :
- (A) Natural classification
 - (B) Phylogenetic classification
 - (C) Phenetic classification
 - (D) Evolutionary classification
49. The scientific names of animals from sub-genera and above are :
- (A) Uninomial
 - (B) Binomial
 - (C) Trinomial
 - (D) Polynomial
50. The system of “binomial name” was devised by :
- (A) Augustin DeCandolle
 - (B) Alphonse DeCandolle
 - (C) Caspar Baubin
 - (D) Carl Linnaeus

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