



2236

Paper Code : 20

Sr. No.

LIFE SCIENCES [Paper-II]

Signature and Name of Invigilator

- (Signature) _____
(Name) _____
- (Signature) _____
(Name) _____

OMR Sheet No. :

(To be filled by the candidate)

Roll No.

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(In Figures as per admission card)

Roll No. _____

(In words)

Time : 1½ Hours]

[Maximum Marks : 100

Number of Pages in this Booklet : 8

Number of Questions in this Booklet : 50

Instructions for the Candidates

- Write your roll number in the space provided on the top of this page.
- This paper consists of fifty multiple-choice type of questions.
- At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below :
 - Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Fault booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.
 - After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.
- Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the oval as indicated below on the correct response against each item.
Example :

A	B	C	D
○	○	●	○

 where (C) is the correct response.
- Your responses to the items are to be indicated in the Answer Sheet given inside the Paper I Booklet only. If you mark at any place other than in the ovals in the Answer Sheet, it will not be evaluated.
- Read instructions given inside carefully.
- Rough Work is to be done in the end of this booklet.
- If you write your name or put any mark on any part of the test booklet, except for the space allotted for the relevant entries, which may disclose your identity, you will render yourself liable to disqualification.
- You have to return the test question booklet and OMR Answer sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall.
- Students can take home carbon copy of this OMR answer sheet.
- Use only Blue/Black Ball point pen.
- Use of any calculator or log table etc., is prohibited.
- There is no negative marks for incorrect answers.

परीक्षार्थियों के लिए निर्देश

- पहले पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए।
- इस प्रश्न-पत्र में पचास बहुविकल्पीय प्रश्न हैं।
- परीक्षा प्रारम्भ होने पर, प्रश्न-पुस्तिका आपको दे दी जायेगी। पहले पाँच मिनट आपको प्रश्न-पुस्तिका खोलने तथा उसकी निम्नलिखित जाँच के लिए दिये जायेंगे, जिसकी जाँच आपको अवश्य करनी है :
 - कवर पृष्ठ पर छपे निर्देशानुसार प्रश्न-पुस्तिका के पृष्ठ तथा प्रश्नों की संख्या को अच्छी तरह चैक कर लें कि वे पूरे हैं। दोषपूर्ण पुस्तिका जिनमें पृष्ठ/प्रश्न कम हों या दुबारा आ गये हों या सीरियल में न हों अर्थात् किसी भी प्रकार की त्रुटिपूर्ण पुस्तिका स्वीकार न करें तथा उसी समय उसे लौटाकर उसके स्थान पर दूसरी सही प्रश्न-पुस्तिका ले लें। इसके लिए आपको पाँच मिनट दिये जायेंगे। उसके बाद न तो आपको प्रश्न-पुस्तिका वापस ली जायेगी और न ही आपको अतिरिक्त समय दिया जायेगा।
 - इस जाँच के बाद OMR पत्रक की क्रम संख्या इस प्रश्न-पुस्तिका पर अंकित कर दें।
- प्रत्येक प्रश्न के लिए चार उत्तर विकल्प (A), (B), (C) तथा (D) दिये गये हैं। आपको सही उत्तर के दीर्घवृत्त को पेन से भरकर काला करना है जैसा कि नीचे दिखाया गया है।
उदाहरण :

A	B	C	D
○	○	●	○

 जबकि (C) सही उत्तर है।
- प्रश्नों के उत्तर केवल प्रश्न पत्र I के अन्दर दिये गये उत्तर-पत्रक पर ही अंकित करने हैं। यदि आप उत्तर पत्रक पर दिये गये दीर्घवृत्त के अलावा किसी अन्य स्थान पर उत्तर चिह्नानकित करते हैं, तो उसका मूल्यांकन नहीं होगा।
- अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें।
- कच्चा काम (Rough Work) इस पुस्तिका के अन्तिम पृष्ठ पर करें।
- यदि आप उत्तर-पुस्तिका पर अपना नाम या ऐसा कोई भी निशान करते हैं तो परीक्षा के लिये अयोग्य घोषित कर दिये जायेंगे।
- आपको परीक्षा समाप्त होने पर प्रश्न-पुस्तिका एवं OMR उत्तर-पत्रक निरीक्षक महोदय को लौटाना आवश्यक है और परीक्षा समाप्ति के बाद उसे अपने साथ परीक्षा भवन से बाहर न लेकर जायें।
- परीक्षा समाप्ति पर परीक्षार्थी OMR उत्तर-पत्रक की कार्बन कापी अपने साथ ले जा सकते हैं।
- केवल नीले/काले बाल च्वाइट पेन का ही इस्तेमाल करें।
- किसी भी प्रकार का संगणक (केलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है।
- गलत उत्तरों के लिए कोई अंक काटे नहीं जायेंगे।

Paper Code : [20]

Paper-II [LIFE SCIENCES]

Note : • This paper contains Fifty (50) multiple choice questions, each question carrying two (2) marks.

नोट : • इस प्रश्नपत्र में पचास (50) बहुविकल्पीय प्रश्न हैं। प्रत्येक प्रश्न के दो (2) अंक हैं।

1. Which of the following is a disaccharide(s) ?
(A) Glucose (B) Xylose
(C) Lactose (D) Galactose
2. Which one of the following is a nucleotide ?
(A) Adenine (B) Guanosine
(C) Cytidylic acid (D) Uridine
3. Which of the following is not according to Chargaff's rule :
(A) $A + G = T + C$ (B) $A + T = U + C$
(C) $A - G = T - C$ (D) $A - T = C - G$
4. A nanometer is :
(A) One-millionth of a meter (B) One-billionth of a meter
(C) One thousandth of a millimeter (D) One millionth of a centimeter
5. Simultaneous movement of two molecules in the same direction is known as :
(A) Symport (B) Antiport
(C) Uniport (D) Biport
6. In plants cell the pressure results from the movement of water in the cell and pushes the plasma membrane against the rigid cell wall and provides a force for cell expansion is known as :
(A) Wall pressure (B) Turgor pressure
(C) Osmotic pressure (D) Membrane pressure
7. Which of the following takes place during diplotene stage of prophase I of meiosis ?
(A) Compaction of chromosomes (B) Formation of synaptonemal complexes
(C) Formation of recombination nodules (D) Dissolution of synaptonemal complexes
8. G₁ phase of cell cycle :
(A) Preceeds S phase (B) Succeeds S phase
(C) is interspersed between S and M phases (D) is a quiescent phase
9. Which group of proteins represent the complete set required for chain elongation and connecting okazaki fragments :
(A) Single strand binding protein (SSB), helicase, primase
(B) DNA polymerase, SSB, DNA gyrase, DNA ligase
(C) SSB, DNA gyrase, primase
(D) SSB, DNA topoisomerase, helicase
10. The SOS repair mechanism is activated by :
(A) Hydroxylamine (B) 5-bromouracil
(C) Thymine dimers (D) 2-aminopurine
11. The ribosome is involved in all of the following except :
(A) Formation of peptide bond
(B) tRNA aminoacylation
(C) Binding of protein factors during elongation
(D) Binding of aminoacyl tRNA to mRNA

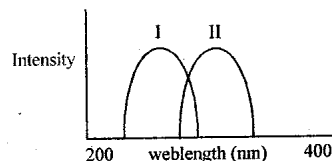
12. A bacterial culture growing rapidly in Kanamycin free medium developed only three colonies when transferred on a kanamycin containing plate. The most likely explanation is :
- (A) Three bacteria developed resistance due to kanamycin exposure
 (B) All bacteria will grow in presence of kanamycin eventually
 (C) Kanamycin induced mutations in three bacterial cells that made them resistant
 (D) Three bacteria were resistant to kanamycin before being exposed to it and generated kanamycin resistant colonies.
13. Select the correctly matched option between column A and Column B :
- | Column A | Column B |
|---|--------------------------|
| P. Thin and extensible cell covering on new plant cells that can accommodate their growth. | 1. Cellulose microfibril |
| Q. Bundle of about 40, long, linear chains of covalently linked glucose residues, all with the same polarity, organized in an overlapping parallel array. | 2. Secondary cell wall |
| R. A complex network of phenolic compounds that is an abundant polymer in secondary cell walls. | 3. Primary cell wall |
| S. Rigid cell covering laid down in layers inside the initial covering once cell growth has stopped. | 4. Lignin |
- (A) P-1, Q-4, R-3, S-2
 (B) P-4, Q-2, R-1, S-3
 (C) P-2, Q-3, R-4, S-1
 (D) P-3, Q-1, R-4, S-2
14. Select the correct match between items of column A and column B :
- | Column A | Column B |
|---|----------------------|
| P. The cause of human warts and a causative factor in carcinomas of the uterine cervix | 1. Colorectal cancer |
| Q. Tumor suppressor gene-found mutated in about half of human cancers-that encodes a gene regulating protein that is activated by DNA damage. | 2. P53 |
| R. Common carcinoma of the epithelium lining, the colon and rectum. | 3. Papillomovirus |
| S. General term for a normal gene in which a gain-of-function can drive a cell towards cancer. | 4. Protooncogene |
- (A) P-3, Q-2, R-1, S-4
 (B) P-2, Q-1, R-3, S-4
 (C) P-4, Q-2, R-1, S-3
 (D) P-1, Q-2, R-3, S-4
15. Which of the following is NOT a member of the immunoglobulin superfamily :
- (A) Antibodies
 (B) Lymphokines
 (C) Fc receptors on leukocytes
 (D) MHC glycoprotein

16. Infection by RNA viruses generally results in the formation of double stranded RNA during genome replication. Double stranded RNA stimulates the enzymatic activity of :
 (A) Interferon
 (B) Double-stranded RNA-dependent protein kinases
 (C) Phospholipase C (D) Sphingomyelinase
17. The male gametophytes of flowering plants are shed at :
 (A) 2-or 3-celled stage (B) only at 2-celled stage
 (C) only at 3-celled stage (D) at single-cell stage
18. The human embryo that consists of only two layer of cells is called :
 (A) Blastocyst (B) Embryonic disc
 (C) Placenta (D) Amniotic sac
19. From what region of the cellular blastoderm are cells drawn to produce endoderm and mesoderm :
 (A) Cephalic furrow (B) Ventral furrow
 (C) Neural plate (D) Primitive groove
20. All modern reptiles, birds and mammals, show exactly the same pattern of membranes within the egg. Therefore, these three classes are called :
 (A) Amniotes (B) Non-amniotes
 (C) Monotremes (D) Placentals
21. Select the correctly matched option :
- | Column A | Column B |
|---|------------------------|
| P. Protease that has a cysteine at its active site and cleaves its target protein by specific aspartic acid. | 1. Survival factor |
| Q. Form of cell death that leads to fragmentation of the DNA, shrinkage of the cytoplasm, membrane changes and cell death, without lysis or damage to neighboring cells | 2. Caspase |
| R. Extracellular signal molecule that inhibits apoptosis | 3. Apoptosis |
| S. Activation of caspase | 4. Fas |
| (A) P-3, Q-1, R-3, S-4 | (B) P-4, Q-1, R-4, S-3 |
| (C) P-2, Q-3, R-1, S-4 | (D) P-1, Q-2, R-4, S-3 |
22. The exudation of liquid water from leaves is due to :
 (A) Guttation (B) Transpiration
 (C) Translocation (D) Photorespiration
23. Select the option that has all correct matches between item of column A and column B given below :
- | Column A | Column B |
|--------------------------|-----------------------------|
| 1. Reporter molecule | (a) non-radioactive label |
| 2. Dideoxy terminators | (b) Probe |
| 3. Biotin | (c) Sanger method |
| 4. Ligase chain reaction | (d) Detects point mutations |

- (A) 1-a, 2-c, 3-d, 4-a (B) 1-d, 2-b, 3-a, 4-c
 (C) 1-b, 2-c, 3-a, 4-d (D) 1-c, 2-a, 3-b, 4-d
24. The plant disease associated with the discovery of gibberellins in :
 (A) Blight (B) Bakanne
 (C) Rust (D) Smut
25. In C_4 plants the first product of CO_2 fixation is :
 (A) 3-phosphoglycerate (B) Oxaloacetate
 (C) Phosphoenolpyruvate (D) Oxalopyruvate
26. The Pancrease has :
 (A) Both exocrine and endocrine functions (B) Only exocrine function
 (C) Only endocrine function (D) Neither exocrine nor endocrine functions
27. All vertebrate have a :
 (A) Open circulatory system (B) Closed circulatory system
 (C) Diffused circulatory system (D) Truncated circulatory system
28. Maturing erythrocytes lose their nuclei in :
 (A) Birds (B) Reptiles
 (C) Mammals (D) Fishes
29. Which option represents the correct match between items of column A and B ?
- | Column A | Column B |
|----------------------------------|----------------------------------|
| 1. Adipose cells | 1. The cells of cartilage |
| 2. Cartilage | 2. Bone |
| 3. Chondrocytes | 3. Muscles |
| 4. Haversian canals | 4. Specialized connective tissue |
| 5. Myosin proteins | 5. Neurotransmitter |
| 6. Acetylcholine (ACW) | 6. Fat cells |
| (A) 1-6, 2-4, 3-1, 4-2, 5-3, 6-5 | (B) 1-4, 2-6, 3-1, 4-2, 5-3, 6-5 |
| (C) 1-6, 2-4, 3-1, 4-2, 5-5, 6-3 | (D) 1-4, 2-6, 3-1, 4-2, 5-5, 6-3 |
30. The degree of effect produced by a given genotype under a given set of environmental conditions or over a range of environmental conditions :
 (A) Recessive (B) Penetance
 (C) Expressvity (D) Codominance
31. Alleles that task dominance relationships and results in heterozygotes that have an intermediate phonotype that is distinct from either homozygous parents are called :
 (A) Incomplete dominance (B) Lethal allele
 (C) Codominance (D) None the above
32. Small circular DNA molecules that are capasle of self replication are called :
 (A) Plasmids (B) Introns
 (C) Transposable elements (D) None of the above
33. A mother of blood group O has a group O child The father could be :
 (A) A or B or O (B) O only
 (C) A or B (D) AB only
34. The maximum number of individuals a certain area can sustain is known as :
 (A) The intrinsic rate of growth (B) The resource limit
 (C) The carrying capacity (D) The logistic equaiton

35. The most common habitat of a landscape is called :
- (A) Matrix (B) Fragment
(C) Perforation (D) Metapopulation
36. Which of the options represent all the correct between the term of column A and B ?
- | Column A | Column B |
|--|--|
| 1. Life span short | 1. r-selected |
| 2. Logistic growth | 2. Growth rate increase with population size |
| 3. $\frac{dN}{dt} = r_i N$ | 3. Age structure |
| 4. Allee effect | 4. Exponential Growth model |
| 5. Growth rate of population is sensitive to | 5. Population |
| 6. Parental care extensive | 6. K-selected |
| (A) 1-1, 2-5, 3-4, 4-2, 5-3, 6-6 | (B) 1-2, 5-1; 3-4, 4-2, 5-3, 6-6 |
| (C) 1-1, 2-5, 3-4, 4-2, 5-6, 6-3 | (D) 1-5, 2-1, 3-4, 4-2, 5-3, 6-6 |
37. Competition between plants for water would tend to promote which dispersion pattern ?
- (A) Clumped (B) Uniform
(C) Random (D) Fregmented
38. The entire niche that a species is capable of using based on its :
- (A) Physiological tolerance limits and resource need
(B) Food consumption
(C) Space utilization
(D) Temperature range
39. During history of the life on earth :
- (A) There have been major extinction events
(B) Speies diversity has steadily increased
(C) Species diversity has stayed relatively constant
(D) Extinction rates have been completely offset by speciation rate
40. Gene flow :
- (A) Is the movement of alleles from one population to another population
(B) Is the movement of alleles from one individual to another individual
(C) Is the movement of alleles in individual
(D) Is the movement of alleles from animal to plant
41. The Hardy-Weinberg principle states :
- (A) The proportion of homozygotes and heterozygotes in a population should remain unchanged in absence of agents of evolutionary change
(B) The proportion of homozygotes and heterozygotes in a population changed in absence of evolving processes
(C) Population do not change with evolutionary processes
(D) Population change with evolutionary processes

42. A reactor containing 20–40 μm of a large particles having immobilized enzymes the particles become suspended in the reaction mixture when the substrate solution is pumped in :
- (A) Packed bed reactor (B) Stirred tank reactor
(C) Immobilized cell reactor (D) Fluidized bed reactor
43. Reciprocal cross involves crossing between :
- (A) Different strains with the sex reversed
(B) Between F_1 generation and the recessive parental type
(C) Between types having one of the contrasting pair of characters
(D) Between types having two or more contrasting pair of characters
44. The main advantage of use of male sterile lines in hybrid seed production is that, it :
- (A) Eliminates manual pollination (B) Eliminates emasculation
(C) Shows improved yield (D) More attractive for pollinations
45. Test cross is the cross of an F_1 hybrid to one of :
- (A) The parental types (B) The dominant parental type
(C) The recessive parental type (D) Progenies of cross between above two
46. The density of bacterial cells in the given suspension is 4×10^6 . What would be the average number of bacteria present in the smallest chamber ($1\text{mm} \times 1\text{mm} \times 0.1\text{mm} \div 400$) of the haemocytometer mounted with the same suspension :
- (A) 1 (B) 4
(C) 100 (D) 400
47. Consider the following pair of spectra. One is an absorption spectrum and other is a fluorescence spectrum. Which is which ?



- (A) I-Flourescence, II-Absorption (B) I-Absorption, II-Flourescence
(C) Not possible to predict (D) Either can be absorption or flourescence
48. Interaction between biomolecules is most reliably detected by :
- (A) Mass spectrometry (B) ELISA
(C) Surface Plasmon Resonance (D) Ion-Exchange chromatography
49. In NMR spectrum the width of a line is a measure of :
- (A) Relative mobility of a nucleus (B) Mobility of functional groups
(C) Absorption by groups (D) Width does not represent any thing
50. The organism earlier put under prochlorophyta have now been included in :
- (A) Chlorophyta (B) Cyarophyta
(C) Rhodophyta (D) Xonthophyta