SUBJECT CODE	SUBJECT	PAPER
A-09-02	LIFE SCIENCES	II

HALL TICKET NUMBER	QUESTION BOOKLET NUMBER

OMR SHEET NUMBER

DURATION	MAXIMUM MARKS	NUMBER OF PAGES	NUMBER OF QUESTIONS
1 HOUR 15 MINUTES	100	16	50

This is to certify that, the entries made in the above portion are correctly written and verified.

Candidate's Signature **Name and Signature of Invigilator**

Instructions for the Candidates

1. Write your Hall Ticket Number in the space provided on the top of this page.
2. This paper consists of fifty multiple-choice type of questions.
3. 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** :
   (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 and do not accept an 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 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.**
   (iii) After this verification is over, the Test Booklet Number should be entered in the OMR Sheet and the OMR Sheet Number should be entered on this Test Booklet.
4. Each item 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: (A) (B) ● (D)
   where (C) is the correct response.
5. Your responses to the items are to be indicated in the **OMR Answer Sheet given to you**. If you mark at any place other than in the circle in the Answer Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
8. If you write your name or put any mark on any part of the OMR Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, you will render yourself liable to disqualification.
9. **The candidate must handover the OMR Answer Sheet to the invigilators at the end of the examination compulsorily** and must not carry it with you outside the Examination Hall. The candidate is allowed to take away the carbon copy of OMR Sheet and used Question paper booklet at the end of the 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 marks for incorrect answers.**

అభ్యర్థులకు సూచనలు

1. ఈ పుట పై భాగంలో ఇవ్వబడిన స్థలంలో మీ హాల్ టికెట్ నంబరు రాయండి.
2. ఈ ప్రశ్న పత్రము యాభై బహుళైచ్చిక ప్రశ్నలను కలిగి ఉంది.
3. పరీక్ష ప్రారంభమున ఈ ప్రశ్నాపత్రము మీకు ఇవ్వబడుతుంది. మొదటి ఐదు నిమిషములలో **ఈ ప్రశ్నాపత్రమును తెరిచి కింద తెలిపిన అంశాలను తప్పనిసరిగా సరిచూసుకోండి.**
   (i) ఈ ప్రశ్న పత్రమును చూడడానికి కవర్‌పేజి అంచున ఉన్న కాగితపు సీలును చించండి. స్టిక్కర్ సీలులేని మరియు ఇదివరకే తెరిచి ఉన్న ప్రశ్నాపత్రమును మీరు అంగీకరించవద్దు.
   (ii) **కవరు పేజి పై ముద్రించిన సమాచారం ప్రకారం ఈ ప్రశ్నపత్రములోని పేజీల సంఖ్యను మరియు ప్రశ్నల సంఖ్యను సరిచూసుకోండి. పేజీల సంఖ్యకు సంబంధించి గానీ లేదా సూచించిన సంఖ్యలో ప్రశ్నలు లేకపోవుట లేదా నిజప్రతి కాకపోవుట లేదా ప్రశ్నలు క్రమపద్ధతిలో లేకపోవుట లేదా ఏవైనా తేడాలుండుట వంటి దోషపూరితమైన ప్రశ్న పత్రాన్ని వెంటనే మొదటి ఐదు నిమిషాల్లో పరీక్షా పర్యవేక్షకునికి తిరిగి ఇచ్చివేసి దానికి బదులుగా సరిగ్గా ఉన్న ప్రశ్నపత్రాన్ని తీసుకోండి. తదనంతరం ప్రశ్నపత్రము మార్చబడదు అదనపు సమయం ఇవ్వబడదు.**
   (iii) పై విధంగా సరిచూసుకొన్న తర్వాత ప్రశ్నాపత్రం సంఖ్యను OMR పత్రము పై అదేవిధంగా OMR పత్రము సంఖ్యను ఈ ప్రశ్నాపత్రము పై నిర్దిష్టస్థలంలో రాయవలెను.
4. ప్రతి ప్రశ్నకు నాలుగు ప్రత్యామ్నాయ ప్రతిస్పందనలు (A), (B), (C) మరియు (D) లుగా ఇవ్వబడ్డాయి. ప్రతిప్రశ్నకు సరైన ప్రతిస్పందనను ఎన్నుకొని కింద తెలిపిన విధంగా OMR పత్రములో ప్రతి ప్రశ్నా సంఖ్యకు ఇవ్వబడిన నాలుగు వృత్తాల్లో సరైన ప్రతిస్పందనను సూచించే వృత్తాన్ని బాల్ పాయింట్ పెన్‌తో కింద తెలిపిన విధంగా పూరించాలి.
   ఉదాహరణ : (A) (B) ● (D)
   (C) సరైన ప్రతిస్పందన అయితే
5. ప్రశ్నలకు ప్రతిస్పందనలను ఈ ప్రశ్నపత్రముతో ఇవ్వబడిన OMR పత్రము పైన ఇవ్వబడిన వృత్తాల్లోనే పూరించి గుర్తించాలి. అలాకాక సమాధాన పత్రంపై వేరొక చోట గుర్తిస్తే మీ ప్రతిస్పందన మూల్యాంకనం చేయబడదు.
6. ప్రశ్న పత్రము లోపల ఇచ్చిన సూచనలను జాగ్రత్తగా చదవండి.
7. చిత్తుపనిని ప్రశ్నపత్రము చివర ఇచ్చిన ఖాళీస్థలములో చేయాలి.
8. OMR పత్రము పై నిర్ణీత స్థలంలో సూచించబడిన వివరాలు తప్పించి ఇతర స్థలంలో మీ గుర్తింపును తెలిపే విధంగా మీ పేరు రాయడం గానీ లేదా ఇతర చిహ్నాలను పెట్టడం గానీ చేసినట్లయితే మీ అనర్హతకు మీరే బాధ్యులవుతారు.
9. **పరీక్ష పూర్తయిన తర్వాత మీ OMR పత్రాన్ని తప్పనిసరిగా పరీక్ష పర్యవేక్షకుడికి ఇవ్వాలి.** వాటిని పరీక్ష గది బయటకు తీసుకువెళ్లకూడదు. పరీక్ష పూర్తయిన తరువాత అభ్యర్థులు ప్రశ్న పత్రాన్ని, OMR పత్రం యొక్క కార్బన్ కాపీని తీసుకువెళ్లవచ్చు.
10. **నీలి/నల్ల రంగు బాల్ పాయింట్ పెన్ మాత్రమే ఉపయోగించాలి.**
11. **లాగరిథమ్ టేబుల్స్, క్యాలిక్యులేటర్‌లు, ఎలక్ట్రానిక్ పరికరాలు మొదలగునవి పరీక్షగదిలో ఉపయోగించడం నిషేధం.**
12. **తప్పు సమాధానాలకు మార్కుల తగ్గింపు లేదు.**

LIFE SCIENCES
Paper – II

1. Which of the following can give a buffer solution ?

(A) $CH_3COOH + CH_3COONa$

(B) $H_2SO_4 + Na_2SO_4$

(C) HCl + NaCl

(D) HCl + NaOH

2. What will happen if strict anaerobic microorganisms are exposed to oxygen gas ?

(A) Growth rate of microorganisms will be enhanced

(B) Growth rate of microorganisms will be normal as before

(C) Growth rate will be zero, but cell size increases

(D) Microorganisms will die

3. A new antibiotic was discovered which strongly inhibited mRNA precursor transcripts and snRNA transcripts. This antibiotic is predicted to be an inhibitor of

(A) RNA polymerase I

(B) RNA polymerase II

(C) RNA polymerase III

(D) Helicase

4. An endocrine hormone may be differentiated from paracrine hormone by

I. Type of receptor it reacts with

II. Concentration synthesized

III. Mechanism of action

IV. Half life of hormone

(A) I and II are correct

(B) II and III are correct

(C) II and IV are correct

(D) I and III are correct

5. Acrosome reaction in sperms is initiated with

(A) Capacitation

(B) Fertilizin

(C) Influx of Na^+ in sperm

(D) Release of Lysins

6. Which of the following is an example to flavomolybdo catalytic protein ?

(A) Nitrate reductase

(B) Nitrite reductase

(C) Glutamine synthatase

(D) Glutamine-2-oxoglutarate aminotransferase

7. The pacemaker of the heart is

(A) Ranvier's node

(B) Hensen's node

(C) Auriculo-ventricular node

(D) Sino-auricular node

8. A scientist discovered a new trait in an individual to localize the gene to autosomal or allosomal, he performed reciprocal crosses. The reciprocal crosses yield which of the following ?

(A) Autosomal

(B) X-linked

(C) Y-linked

(D) Sex-linked

9. Cape-goose-berry, brinjal, radish, amomum and knol-knol belong to

(A) five plant families

(B) three plant families

(C) four plant families

(D) two plant families

10. The phenomenon of character displacement was explained by

(A) Odum

(B) Brown and Wilson

(C) MacArthur and Levins

(D) Parson and Strickland

11. Which of the following three are considered as primary domains as per the latest concept of phylogenetic evolution ?

1. Protozoa
2. Bacteria
3. Algae
4. Archaea
5. Slime molds
6. Eukarya

(A) 1, 3, 5

(B) 2, 4, 6

(C) 3, 1, 5

(D) 3, 5, 6

12. A fermentation industry produces citric acid as its product using 100 % efficient production strain *Aspergillus niger*. In a production batch if 10 kg of glucose is taken as substrate, the quantity of citric acid produced

(A) 5 kg

(B) 10 kg

(C) 15 kg

(D) 20 kg

13. Match the method of separation with its principle of separation

List – I	List – II
I. Filtration	1. Specific gravity
II. Ultrafiltration	2. Electric charge
III. Centrifugation	3. Molecular size
IV. Ion-exchanger	4. Particle size

	I	II	III	IV
(A)	3	4	1	2
(B)	1	3	4	2
(C)	4	3	1	2
(D)	2	4	3	1

14. Arrange the following carbohydrates in the increasing order of the number of carbon atoms

1. Sucrose
2. Glucose
3. Glycerol
4. Ribose

(A) 1, 2, 4, 3

(B) 4, 3, 2, 1

(C) 2, 3, 4, 1

(D) 3, 4, 2, 1

15. Arrange the following events of animal cell division in correct order

1. Separation of sister chromatids
2. Breakdown of nuclear envelope
3. Decondensation of chromosomes
4. Duplication of centrosome
5. Condensation of chromosomes

(A) 2, 5, 1, 4, 3

(B) 4, 5, 2, 1, 3

(C) 2, 5, 4, 3, 1

(D) 4, 2, 5, 3, 1

16. Synapsis is the process whereby

(A) Homologous pairs of chromosomes separate and migrate towards a pole

(B) Homologous chromosomes exchange chromosomal material

(C) Homologous chromosomes become closely associated

(D) The daughter cells contain half of the genetic material of the parent cell

17. Arrange the following in the order of signal transduction to nucleus :

I. Second messenger

II. Receptor

III. Transcription factor

IV. Serine kinase

V. Hormone

(A) I → II → III → IV → V

(B) V → II → I → IV → III

(C) V → II → III → IV → I

(D) V → IV → II → I → III

18. In Dorsoventral patterning of the neural tube the ventralizing signals and dorsalizing signals are released by

I. Notochord

II. Floor plate

III. Somites

IV. Ectoderm

Of these above, which are associated with ventralizing signals ?

(A) I, II and III

(B) II, III and IV

(C) III, IV and I

(D) I, III and IV

19. The inhibitor for Alternate Oxidase (AO) enzyme is

(A) HCN

(B) DCMU

(C) SHAM

(D) Mevalonate

20. Cardiac output of "aneural" heart is regulated by

I. Parasympathetic innervation

II. Extrinsic control system

III. Changes in end-diastolic volume

IV. The activity of the animal

Identify the correct pair of distractors

(A) I and II

(B) II and III

(C) III and IV

(D) I and IV

21. What would happen if in a gene encoding a polypeptide of 50 amino acids, 25th codon (UAU) is mutated to UAA ?

(A) A polypeptide of 25 amino acids will be formed

(B) A polypeptide of 49 amino acids will be formed

(C) A polypeptide of 24 amino acids will be formed

(D) Two polypeptides of 24 and 25 amino acids will be formed

22. Match the following :

List – I	List – II
I. Corbett National Park	1. Rajasthan
II. Kazirang National Park	2. Kerala
III. Bharatpur Bird Sanctuary	3. Uttaranchal
IV. Sundarbans National Park	4. Assam
	5. West Bengal

	I	II	III	IV
(A)	3	4	1	5
(B)	4	2	1	5
(C)	3	4	2	5
(D)	4	1	2	5

23. The specific physical space occupied by an organism as well as its functional role in ecosystem is known as

(A) Plankton

(B) Nekton

(C) Niche

(D) Population

24. Decrease in response to a repeated stimuli that has neither positive nor negative consequence is

(A) Associated learning

(B) Non-associative learning

(C) Clinical conditioning

(D) Operant learning

25. Protoplasm fusion is facilitated by

(A) Sodium alginate

(B) Ethylene diamine tetra acetic acid

(C) Phenyl mercuric acetate

(D) Polyethyleneglycol

26. DNA oligonucleotides deposited onto an inert substrate such as glass silicon is

(A) Finger print

(B) Probe

(C) Sequence

(D) Microarray

27. Match the following enzymes with their metabolic pathways

List – I	List – II
I. Phosphofructo kinase	1. Pentose phosphate pathway
II. Glucose-6-phosphate dehydrogenase	2. TCA cycle
III. Fructose bis-phosphatase	3. Glycolysis
IV. Aconitase	4. Gluconeo genesis

	I	II	III	IV
(A)	4	3	1	2
(B)	3	1	4	2
(C)	4	2	3	1
(D)	1	3	2	4

28. Human DNA of a given sample contained 20% of cytosine on molar basis. What are the mole percents of Adenosine, Guanine and Thymine respectively ?

(A) 20, 30, 30

(B) 20, 40, 20

(C) 30, 20, 30

(D) 60, 20, 20

29. In *E.coli*, transcription initiation of many operons is induced by

(A) CRP repressor

(B) Trp inducer

(C) CRP activator

(D) GST inducer

30. Gleevec inhibits the following signaling molecule

(A) Ras G-protein

(B) VEGF vaso Endothelial Growth Factor

(C) Bcr-Abl Kinase

(D) Raf

31. Identify the correct matching :

List – I	List – II
I. Radial cleavage	1. Rabbit
II. Rotational cleavage	2. Neeris
III. Spiral cleavage	3. Sea cucumber
IV. Bilateral cleavage	4. Tunicate

	I	II	III	IV
(A)	1	2	3	4
(B)	2	1	4	3
(C)	3	2	4	1
(D)	3	1	2	4

32. The substance which imparts Systemic Acquired Resistance (SAR) to plants is

(A) Putrescine

(B) Salicylic acid

(C) Ethylene

(D) Methyl Jasmonate

33. Match the following :

List – I	List – II
I. Testocerebellar input	1. Vision
II. Superior rectus	2. Vagus
III. Facial nerve	3. Oeulomotor (III)
IV. 2nd cranial nerve	4. Visual and Auditory
	5. VII cranial nerve

	I	II	III	IV
(A)	1	2	3	4
(B)	3	4	5	1
(C)	4	3	5	1
(D)	4	3	2	1

34. Match the following Human Karyotyping symbols

List – I	List – II
I. 13 p	1. Long arm of chromosome 13
II. 13 Q	2. Short arm of chromosome 13
III. del(2)	3. Deletion of the long arm of chromosome 2
IV. 2Q –	4. Deletion in chromosome 2

	I	II	III	IV
(A)	2	1	4	3
(B)	2	1	3	4
(C)	1	2	4	3
(D)	1	2	3	4

35. Little leaf of brinjal and spike disease of sandal are caused by

(A) Nutritional deficiency

(B) Virus

(C) Phytoplasma

(D) Bacteria

36. A transition zone between two adjacent biomes are known as

(A) Ecotone

(B) Ecotype

(C) Ecad

(D) Ecosystem

37. **Assertion (A) :** Domestication has led to unintentional selection for same traits

Reason (R) : The behavior of the experimental animals changed, and they exhibited other traits of other associated animals.

(A) Both (A) and (R) are wrong

(B) Only (A) is correct and (R) is wrong

(C) (A) is correct and (R) is not correct explanation to (A)

(D) Both (A) and (R) are correct, and (R) is a right explanation

38. Match the following in terms of structure-morphological symmetry given in the left and representative example of virus given in the right.

I. Icosahedral symmetry	1. T-even phage
II. Helical symmetry	2. Adenovirus
III. Complex Symmetry	3. Tobacco mozaic virus

	I	II	III
(A)	2	1	3
(B)	2	3	1
(C)	3	2	1
(D)	3	1	2

39. Microscopy which is capable of producing a three dimensional image of the specimen is

(A) compound microscope

(B) phase contrast microscope

(C) confocal microscope

(D) transmission electron microscope

40. Which of the following is an example of a non-covalent interaction in proteins ?

(A) Salt bridge

(B) Disulfide bridge

(C) Peptide bond

(D) Phosphodiester bond

41. **Assertion (A) :** The lysosomal enzymes are all acid hydrolases. If a lysosome was to break, the released hydrolases may not cause big damage to cellular constituents.

Reason (R) : pH of the cytosol is higher (7.2) than that of interior of lysosomes (about 5.0).

(A) Both (A) and (R) are correct

(B) Both (A) and (R) are wrong

(C) (A) is correct but (R) is wrong

(D) (R) is correct but (A) is wrong

42. Match the Column I with Column II

I.	Central dogma	1.	Holoenzyme
II.	Okazaki fragments	2.	NARTIs
III.	RNA polymerase	3.	Genetic flow
IV.	Reverse transcriptase	4.	Lagging strand

	I	II	III	IV
(A)	2	4	3	1
(B)	3	4	1	2
(C)	4	1	2	3
(D)	1	3	4	2

43. During the limb development in the vertebrates the following events are witnessed. They are

I. Secretion of signalling proteins to establish dorsoventral axis

II. Establishment of Limb field and Limb bud

III. Formation of apical ectodermal ridge and activity growth factor FGF

IV. Establishment of distal tip of Limb bud called the progress zone

V. Establishment of Limb organizing centre

The correct sequence of events that leads to the formation of Limb is

(A) II $\rightarrow$ V $\rightarrow$ III $\rightarrow$ IV $\rightarrow$ I

(B) I $\rightarrow$ II $\rightarrow$ III $\rightarrow$ IV $\rightarrow$ V

(C) II $\rightarrow$ III $\rightarrow$ IV $\rightarrow$ V $\rightarrow$ I

(D) II $\rightarrow$ III $\rightarrow$ V $\rightarrow$ IV $\rightarrow$ I

44. A blue-light receptor that induces phototropic bending of oat coleoptiles is

(A) Phototropin

(B) Cryptochrome

(C) Phytochrome

(D) Anthocyanin

45. **Assertion (A) :** In most water breathing animals, the pH of the blood increases when the temperature decreases.

Reason (R) : The inversion relationship between blood pH and temperature provides effective enzyme function by maintaining an appropriate relatively constant net ionic enzyme charge as temperature changes.

(A) Only (A) is correct (R) is wrong

(B) Both (A) and (R) are correct and (R) is correct explanation for (A)

(C) Both (A) and (R) are correct, but (R) is not correct explanation for (A)

(D) Both (A) and (R) are wrong

46. Arrange the following sequence of events proposed in ascending years.

1. Sturtevant (first chromosome map of *Drosophila*)
2. McClintock (Crossing over)
3. Ford, Jacob and J.H.Tjio (Chromosomal basis of genetic abnormalities)
4. Bridges (gene balance theory)

(A) $1 \rightarrow 2 \rightarrow 3 \rightarrow 4$

(B) $1 \rightarrow 4 \rightarrow 2 \rightarrow 3$

(C) $2 \rightarrow 4 \rightarrow 3 \rightarrow 1$

(D) $2 \rightarrow 1 \rightarrow 3 \rightarrow 4$

47. **Assertion (A) :** Halophytes grow in the salt marshes, where the soil is rich in salt and said to be physiologically dry

Reason (R) : The halophytic plants possess negatively geotropic roots that grow above the surface of soil, called pneumatophores

(A) Both (A) and (R) are true and (R) is correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not correct explanation of (A)

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

48. The age pyramid of a stable population is

(A) Broad base

(B) Urn shaped

(C) Bell shaped

(D) Inverted

49. Arrange the following in decreasing order of taxonomic group size

1. Strain
2. Order
3. Species
4. Domain
5. Family

(A) 3, 2, 4, 5, 1

(B) 2, 4, 5, 3, 1

(C) 4, 2, 5, 3, 1

(D) 4, 3, 1, 3, 2

50. Match the following lists

List – I	**List – II**
I. Polysiphonia	1. Coenocytic
II. Volvox	2. Unicellular
III. Chlamydomonas	3. Multicellular
IV. Albugo	4. Colonial

	I	**II**	**III**	**IV**
(A)	2	3	1	4
(B)	1	3	2	4
(C)	4	2	1	2
(D)	3	4	2	1

Space for Rough Work

Space for Rough Work

Space for Rough Work