Total No. of Printed Pages : 21

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A

SET-X

PG-EE-2021

SUBJECT : Life Sciences

12497

Sr. No. .....

Time : **1¼ Hours** Max. Marks : **100** Total Questions : **100**

Roll No. (in figures)_____ (in words)_____

Name_____ Date of Birth_____

Father's Name_____ Mother's Name_____

Date of Examination_____

_____ _____

(Signature of the Candidate) (Signature of the Invigilator)

SEAL

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

1. ***All questions are compulsory.***
2. The candidates ***must return*** the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candicate.
4. Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case will be considered.
5. The candidate ***must not*** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers ***must not*** be ticked in the question booklet.
6. ***There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.***
7. Use only **Black** or **Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.
8. *Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained* **30** *minutes after starting of the examination.*

1. All the following may be methods for the inhibition of microbial growth by antibiotics except :

   (1) Antibiotics disrupt cell wall synthesis.

   (2) Antibiotics interfere with cell membrane function.

   (3) Antibiotics prevent the release of energy from ATP.

   (4) Antibiotics inhibit the synthesis of protein.

2. In which of the following would you place the plants having vascular tissue lacking seeds ?

   (1) Pteridophytes

   (2) Gymnosperms

   (3) Bryophytes

   (4) Algae

3. Apomixis is a type of reproduction in plants in which ?

   (1) Fertilization does not take place.

   (2) Male nucleus takes part in fertilization.

   (3) Embryo formation does not take place.

   (4) Generative nucleus takes part in fertilization.

4. From which of the following algae, agar is commercially extracted ?

   (A) Gracillaria

   (B) Fucus

   (C) Sargassum

   (D) Gelidium

   (E) Turbinaria

   (1) C and E

   (2) B and C

   (3) D and E

   (4) A and D

5. In which one of the following pairs of diseases is viral as well as transmitted by mosquitoes ?

(1) Elephantiasis and dengue
(2) Yellow fever and sleeping sickness
(3) Encephalitis and sleeping sickness
(4) Yellow fever and dengue

6. A free living nitrogen-fixing cyanobacterium which can also form symbiotic association with the water fern Azolla is :

(1) Tolypothrix
(2) Nostoc
(3) Chlorella
(4) Anabaena

7. Ionophores are :

(1) the gating mechanisms associated with the transport of ions.
(2) intrinsic proteins that passively transport ions.
(3) chemicals that form pores in the plasma membrane and allow ions to cros.
(4) intrinsic proteins that actively transport ions.

8. The trans Golgi network is :

(1) the intermediate compartment between the ER and the Golgi.
(2) the part of the Golgi where fusion of vesicles from the ER occurs.
(3) where sorting of proteins to the lysosomes, plasma membrane and cell exterior occurs.
(4) the network of vesicles that transport proteins between Golgi cisternae.

9. Most human cells are diploid with total DNA content of 2C. The DNA content increases to 4C before the onset of mitosis. At anaphase, the DNA content of each cluster will be :

(1) 4C
(2) 2C
(3) 1C
(4) 3C

10. Malignant cancer cells have all of the following properties except :

(1) unregulated cell division

(2) inhibition of angiogenesis

(3) resistance to apoptosis

(4) cellular immortality

11. Cytokines are produced by cells of the immune system in response to various physiological stimuli that :

(1) modulate cell function through subsequent cell differentiation or cell proliferation.

(2) facilitate cell lysis.

(3) cause glycosylation of immunoglobulins.

(4) cause histamine release.

12. In what way, if any, does the chromosomal determination of sex differ in Drosophila and humans ?

(1) In humans, the Y-chromosome determines maleness, with female development being a default process, but in Drosophila, the presence of two X-chromosomes determines femaleness, and male development is the default process.

(2) In humans, the Y-chromosome determines maleness, but in Drosophila, the ratio of X-chromosomes to autosomes determines maleness or femaleness.

(3) In humans, it is the presence of only one X-chromosome that triggers male development and two X-chromosomes trigger female development, just as occurs in Drosophila.

(4) In human males, a single Y-chromosome is present in the absence of an X-chromosome, while in Drosophila, a single X-chromosome is present in the absence of a Y-chromosome.

13. How many generations are present in the seed of gymnosperm ?

(1) 2 (2) 3

(3) 1 (4) 4

14. Bryophytes are ***not*** characterised by :

(1) Sporophyte parasitic over gametophyte

(2) Independent gametophyte

(3) Absence of vascular tissues

(4) Independent sporophyte

15. Stems and leaves of bryophytes are :

(1) Analogous to vascular plants

(2) Homologous to vascular plants

(3) Analogous to algae & fungal thallus

(4) None of these

16. The dominant photosynthetic phase in the life-cycle of pteridophyta is equivalent to the :

(1) Gametophytic phase of bryophyta

(2) Sporophytic phase of bryophyta

(3) Gametophytic phase of pteridophytes

(4) Gametophytic phase of gymnosperm

17. In Pteridophytes, reduction division occurs when :

(1) Prothallus is formed

(2) Sex organs are formed

(3) Spores are formed

(4) Gametes are formed

18. In which of the following gametophyte is not independent free living ?

(1) Pinus

(2) Funaria

(3) Marchantia

(4) Pteris

19. Seasonal activity of vascular cambium is influenced by many factors, except :

(1) Geographical location of plant

(2) Relative humidity and temperature

(3) Photoperiod and water supply

(4) Leaf orientation

20. When secondary growth is initiated in dicot stem, what will happen first ?

(1) The cells of cambium divide periclinally to form xylem mother cells

(2) Interfascicular cambium join with intrafascicular cambium

(3) Parenchymatous cells present between vascular bundles become meristematic

(4) Pith get obliterated

21. Select one of the following of important features distinguishing Gnetum from Cycas and Pinus and showing affinities with angiosperms :

(1) Embryo development and apical meristem

(2) Absence of resin duct and leaf venation

(3) Presence of vessel elements and absence of archegonia

(4) Perianth and two integuments

22. Which one of the following is heterosporous ?

(1) Equisetum

(2) Dryopteris

(3) Salvinia

(4) Adiantum

23. A system of classification, in which a large number of traits are considered, is :

(1) Natural system

(2) Phylogenetic system

(3) Artificial system

(4) Synthetic system

24. The book 'Genera plantarum' was written by :

(1) Engler & Prantl
(2) Bentham & Hooker
(3) Bessey
(4) Hutchinson

25. Phylogenetic classification is one which is based on :

(1) Overall similarities
(2) Utilitarian system
(3) Habits of plants
(4) Common evolutionary descent

26. Endosperm of gymnosperm is ontogenetically similar to angiospermic :

(1) Endosperm
(2) Embryo sac
(3) Archegonium
(4) Megasporangia

27. Flowering plants are more successful than other members of the plant world because :

(1) They are large and have a good vascular tissue system
(2) They carry out variety of pollination mechanism
(3) The protected plant embryo can survive in the period of unfavourable conditions
(4) All of these

28. A. Heterospory is found in all members of pteropsida :
B. Selaginella is advance among pteridophytes as it produces seeds
C. Pinus leaves are monomorphic, pinnate compound and have sunken stomata as adaptation against transpiration
D. Sporic meiosis is characteristic of life cycle in many organisms like Volvox, Chlamydomonas and Ulothrix.

(1) All are incorrect
(2) Both B and C are correct
(3) Only B is correct
(4) Only D is incorrect

29. Which phytohormone is synthesised in ripened fruits ?

(1) ABA
(2) Auxin
(3) Cytokinin
(4) Ethylene

30. Which of the following is incorrect about ethylene ?

(1) Promotes root hair formation

(2) It is natural and derivative of carotenoids

(3) It increases the number of female flowers

(4) It causes synchronisation of flowering and fruit set in pineapples

31. Select a correct match :

(1) GA, – Early seed production in conifers

(2) Cytokinin – Synchronise fruit set in pineapples

(3) Auxin – Overcomes senescence

(4) Ethylene – Seed maturation and development

32. Where is the respiratory electron transport system (ETS) located in plants ?

(1) Intermembrane space

(2) Mitochondrial matrix

(3) Outer mitochondrial membrane

(4) Inner mitochondrial membrane

33. Respiratory Quotient (RQ) value of tripalmitin is :

(1) 0.9

(2) 0.7

(3) 0.07

(4) 0.09

34. Conversion of glucose to glucose-6-phosphate, the first irreversible reaction of glycolysis, is catalyzed by :

(1) Aldolase

(2) Hexokinase

(3) Enolase

(4) Phosphofructokinase

35. How many ATP molecules will be produced in muscles by aerobic oxidation of one molecule of glucose ?

(1) 2 (2) 4

(3) 36 (4) 34

36. Plants, but not animals, can convert fatty acids to sugars by a series of reactions called :

(1) Photosynt

(2) Krebs cycle

(3) Glycolysis

(4) Glyoxylate cycle

37. Pasteurization is a process, which means heating of drinks. It is carried out, at what temperature and for how much duration ?

(1) 70°C and 60 minutes

(2) 80°C and 30 minutes

(3) 120°C and 60 minutes

(4) 60-70°C and 30 minutes

38. Lenticels are involved in :

(1) Gaseous exchange (2) Food Transport

(3) Photosynthesis (4) Transpiration

39. Guttation is the result of :

(1) Osmosis (2) Root pressure

(3) Diffusion (4) Transpiration

40. Photosynthetic Active Radiation (PAR) has the following range of wavelengths :

(1) 400-700 nm

(2) 450-950 nm

(3) 340-450 nm

(4) 500-600 nm

41. The C 4 plants are photosynthetically more efficient than C 3 plants because :

(1) They have more chloroplasts

(2) The CO_2 compensation point is more

(3) CO_2 generated during photorespiration is trapped and recycled through PEP carboxylase

(4) The CO_2 efflux is not prevented

42. The frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes was explained by :

(1) T.H. Morgan

(2) Gregor J. Mendel

(3) Alfred Sturtevant

(4) Sutton Boveri

43. What is the genetic disorder in which an individual has an overall masculine development gynaecomastia, and is sterile ?

(1) Turner's syndrome

(2) Klinefelter's syndrome

(3) Edward syndrome

(4) Down's syndrome

44. A woman has an X-linked condition on one of her X chromosomes. This chromosome can be inherited by :

(1) Only daughters

(2) Only sons

(3) Both sons and daughters

(4) Only grandchildren

45. Which one of the following discoveries resulted in a Nobel Prize ?

(1) X-rays induce sex-linked recessive lethal mutations

(2) Cytoplasmic inheritance

(3) Recombination of linked genes

(4) Genetic engineering

46. Normally DNA molecule has A-T, G-C pairing. However, these bases can exist in alternative valency status owing to rearrangements called :

(1) Frame-shift mutation
(2) Tautomerisational mutation
(3) Analog substitution
(4) Point mutation

47. The most striking example of point mutation is found in a disease called :

(1) Down's syndrome
(2) Sickle cell anaemia
(3) Edward syndrome
(4) Night blindness

48. When two genetic loci produce identical phenotypes in cis and trans position, they are considered to be :

(1) Multiple alleles
(2) The parts of same gene
(3) Pseudoalleles
(4) Different genes

49. What map unit (Centimorgan) is adopted in the construction of genetic maps ?

(1) A unit of distance between two expressed genes representing 10% cross over
(2) A unit of distance between two expressed genes representing 100% cross over
(3) A unit of distance between genes an chromosomes, representing 1 % cross over
(4) A unit of distance between genes on chromosomes, representing 50% cross over

50. Expressed Sequence Tags (ESTS) refers to :

(1) Genes expressed as RNA
(2) Polypeptide expression
(3) DNA polymorphism
(4) Novel DNA sequences

51. In history of biology, human genome project led to the development of :

(1) Bioinformatics
(2) Eugeneics
(3) Biotechnology
(4) Genetic engineering

52. If there are 999 bases in an RNA that codes for a protein with 333 amino acids and the base at position 901 is deleted such that the length of the RNA becomes 998 bases, how many codons will bealtered ?

(1) 1
(2) 11
(3) 33
(4) 333

53. The final proof for DNA as the genetic material came from the experiments of :

(1) Griffith
(2) Hershey and Chase
(3) Avery, Mcleod and McCarty
(4) Hargobind Khurana

54. Which one of the following is not a gaseous biogeochemical cycle in ecosystem ?

(1) Nitrogen cycle
(2) Carbon cycle
(3) Sulphur cycle
(4) Phosphorus cycle

55. Which of the following ecological pyramids is generally inverted ?

(1) Pyramid of numbers in grassland
(2) Pyramid of energy
(3) Pyramid of biomass in a forest
(4) Pyramid of biomass in a sea

56. What type of ecological pyramid would be obtained with the following data ?

Secondary consumer : 120 g

Primary consumer : 60g

Primary producer : 10 g

(1) Inverted pyramid of biomass
(2) Pyramid of energy
(3) Upright pyramid of biomass
(4) Upright pyramid of numbers

57. Which ecosystem has the maximum biomass ?

(1) Forest ecosystem
(2) Grassland ecosystem
(3) Pond ecosystem
(4) Lake ecosystem

58. Limit of BOD prescribed by Central Pollution Control Board for the discharge of industrial and municipal waste water into natural surface water, is :

(1) < 3.0 ppm
(2) < 10 ppm
(3) < 100 ppm
(4) < 30 ppm

59. More than 70% of world's freshwater is contained in :

(1) Antarctica
(2) Glaciers and Mountains
(3) Greenland
(4) Polar ice

60. The process by which organisms with different evolutionary history evolve similar phenotypic adaptations in response to a common environmental challenge, is called :

(1) Convergent evolution
(2) Non-random evolution
(3) Adaptive radiation
(4) Natural selection

61. The tendency of population to remain in genetic equilibrium may be disturbed by :

(1) Lack of migration
(2) Lack of mutations
(3) Lack of random mating
(4) Random mating

62. The two antibiotic resistance genes on vector pBR322 are for :

(1) Tetracycline and Kanamycin
(2) Ampicillin and Tetracycline
(3) Ampicillin and Chloramphenicol
(4) Chloramphenicol and Tetracycline

63. Which one of the following equipments is essentially required for growing microbes on a large scale, for industrial production of enzymes ?

(1) BOD incubator
(2) Sludge digester
(3) Industrial oven
(4) Bioreactor

64. DNA precipitation out of a mixture of biomolecules can be achieved by treatment with :

(1) Isopropanol
(2) Chilled ethanol
(3) Methanol at room temperature
(4) Chilled chloroform

65. Following statements describe the characteristics of the enzyme Restriction Endonuclease. Identify the incorrect statement.

(1) The enzyme cuts DNA molecule at identified position within the DNA.
(2) The enzyme binds DNA at specific sites and cuts only one of the two strands.
(3) The enzyme cuts the sugar-phosphate backbone at specific sites on each strand.
(4) The enzyme recognizes a specific palindromic nucleotide sequence in the DNA.

66. The correct order of steps in Polymerase Chain Reaction (PCR) is :

(1) Extension, Denaturation, Annealing
(2) Annealing, Extension, Denaturation
(3) Denaturation, Annealing, Extension
(4) Denaturation, Extension, Annealing

67. Enzyme used in ELISA test is :

(1) Endonuclease
(2) Ligase
(3) Peroxidase
(4) Polymerase

68. What will be the pCO_2 and pO_2 in atmospheric air as compared to alveoli respectively ?

(1) Low and high
(2) High and low
(3) High and high
(4) Low and low

69. In ureotelic animals, urea is formed by :

(1) Kreb's cycle
(2) EM pathway
(3) Ornithine cycle
(4) Cori's cycle

70. Which one of the following mammalian cells is not capable of metabolising glucose to carbon-dioxide aerobically ?

(1) Red blood cells
(2) White blood cells
(3) Unstriated muscle cells
(4) Liver cells

71. All enzymes are proteins except :

(1) Trypsin
(2) Pepsin
(3) Steapsin
(4) Ribozyme and Ribonuclease-P

72. Which of the following is the best evidence for the lock and key theory of enzyme action ?

(1) All isolated enzymes have been identified as protein
(2) Compounds similar in structure to the substrate inhibit the reaction
(3) Enzymes are found in living organisms and speed up certain reaction
(4) Enzymes determine the direction of a reaction

73. Co-enzyme is :

(1) Always a protein

(2) Often a metal

(3) Always an inorganic compound

(4) Often a vitamin

74. A person is eating boiled potato. His food contains :

(1) Cellulose, which can be digested by cellulase

(2) Starch, which cannot be digested

(3) Lactose, which cannot be digested

(4) DNA, which can be digested by pancreatic DNAase

75. Which of the following is a reducing sugar ?

(1) Galactose

(2) Gluconic acid

(3) B-methyl galactoside

(4) Sucrose

76. Which of the following hormones is not secreted by duodenum to inhibit the gastric motility ?

(1) GIP

(2) Enterogastrone

(3) Secretin

(4) Enterokinase

77. In case of vertebrates, lacteals are found in :

(1) Oesophagus

(2) Ear

(3) Small intestine

(4) Ischium

78. The movement of ions against the concentration gradient will be :

(1) Active transport

(2) Osmosis

(3) Diffusion

(4) All of these

79. Vomiting centre is located in the :

(1) Medulla oblongata

(2) Stomach and sometimes in duodenum

(3) GI tract

(4) Hypothalamus

80. Which one of the following vitamins can be synthesised by bacteria inside the gut ?

(1) D

(2) A

(3) B_1

(4) C

81. Which one of the following is a protein deficiency disease ?

(1) Kwashiorkor

(2) Night blindness

(3) Eczema

(4) Cirrhosis

82. Which of the following statement is incorrect wrt inbreeding ?

(1) Inbreeding increases homozygosity

(2) Inbreeding exposes harmful recessive gene that are eliminated by selection

(3) Inbreeding helps in accumulation of deleterious alleles and elimination of desirable alleles

(4) Inbreeding helps in developing a pure-line animal

83. What is correct to say about the hormone action in humans ?

(1) In females, FSH first binds with specific receptors on ovarian cell membrane

(2) FSH stimulates the secretion of estrogen and progesterone

(3) Glucagon is secreted by B-cells of Islets of langerhans and stimulates glycogenolysis

(4) Secretion of thymosins is stimulated with aging

84. Body having meshwork of cells, internal cavities lined with food filtering flagellated cells and indirect development are the characteristics of phylum :

(1) Protozoa

(2) Coelenterata

(3) Porifera

(4) Mollusca

85. Which of the following characteristics is mainly responsible for diversification of insects on land ?

(1) Eyes

(2) Segmentation

(3) Bilateral symmetry

(4) Exoskeleton

86. Which of the following endoparasites of humans does show viviparity ?

(1) Ascaris lumbricoides

(2) Ancylostoma duodenale

(3) Enterobius vermicularis

(4) Trichinella spiralis

87. Select the Taxon mentioned which represents both marine and fresh water species.

(1) Echinoderms

(2) Ctenophora

(3) Cephalochordata

(4) Cnidaria

88. Which one of the following living organisms completely lacks a cell wall ?

(1) Cyanobacteria

(2) Sea-fan(Gorgonia)

(3) Saccharomyces

(4) Blue-green algae

89. Biological organisation starts with :

(1) Cellular level

(2) Organismic level

(3) Atomic level

(4) Submicroscopic molecular level

90. Peripatus is a connecting link between :

(1) Coelenterata and Porifera

(2) Ctenophora and Platyhelminthis

(3) Mollusca and Echinodermata

(4) Annelida and Arthropoda

91. Which one of the following organisms is scientifically correctly named, correctly Printed according to the International Rules of Nomenclature and correctly described ?

(1) E.coli – Full name Entamoeba coli, a commonly occuring bacterium in human intestine

(2) Musca domestica – The common house lizard, a reptile

(3) Plasmodium falciparum – A protozoan pathogen causing the most serious type of malaria

(4) Felis tigris – The Indian tiger, well protected in Gir forests

92. What is true for mammalia ?

(1) Platypus is oviparous

(2) Bats have feathers

(3) Elephant is ovoviviparous

(4) Diaphragm is absent in them

93. Which of the following character is present in all chordates ?

(1) Diaphragm

(2) Vertebral column

(3) Pharyngeal gill clefts

(4) Dorsal solid nerve cord

94. In which of the following animal post anal tail is found ?

(1) Earthworm

(2) Lower invertebrate

(3) Scorpion

(4) Snake

95. In which of the following notochord is present in embryonic stage ?

(1) All chordate

(2) Some chordates

(3) Vertebrates

(4) Non chordates

96. Given below are four matches of an animal and its kind of respiratory organ :

A. Silver fish – Trachea

B. Scorpion – Book lung

C. Sea squirt – Pharyngeal gills

D. Dolphin – Skin

The correct matches are

(1) A and B

(2) A, B and C

(3) B and D

(4) C and D

97. Which one of the following phyla is correctly matched with its two general characteristics ?

(1) Mollusca – Normally oviparous and development through a trochophore or veliger larva

(2) Arthropoda – Body divided into head, thorax and abdomen and respiration by tracheae

(3) Chordata – Notochord at some stage and separate anal and urinary openings to the outside

(4) Echinodermata – Pentamerous radial symmetry and mostly internal fertilization

98. Which of the following are referred as non-vertebrate chordates ?

(1) Ciona, Ascidia, Amphioxus

(2) Lamprey, Myxine, Shark

(3) Scoliodon, Torpedo, Trygon

(4) Pristis, Branchiostoma, Scyllium doutorostomes?

99. Lateral line sense organs are absent in :

(1) Tadpole larva of frog

(2) Bony fishes

(3) Reptiles

(4) Cartilaginous fishes

100. The termination of gastrulation is indicated by :

(1) closure of neural tube

(2) closure of blastopore

(3) obliteration of archenteron

(4) obliteration of blastocoel

Entrance Exam 2021 Answer Key held on dated 21/09/2021 at 10:00 am

Subjects of Life Sciences

Question No.	A	B	C	D
1	3	1	1	4
2	1	2	3	2
3	1	2	2	4
4	4	4	3	4
5	4	1	1	1
6	4	1	2	4
7	3	3	2	3
8	3	1	3	1
9	2	4	3	1
10	2	3	1	3
11	1	3	3	1
12	2	1	3	3
13	2	3	1	2
14	4	4	2	4
15	1	1	4	4
16	1	2	2	1
17	3	1	4	1
18	1	1	1	4
19	4	3	4	4
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21	3	4	3	1
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35	3	4	1	1
36	4	1	2	1
37	4	1	1	3
38	1	4	1	1
39	2	4	3	4
40	1	1	4	3
41	1	1	3	3
42	3	4	2	1
43	2	2	4	3
44	3	2	2	4
45	1	3	2	1
46	2	4	3	2
47	2	4	3	1
48	3	1	1	1
49	3	2	3	3
50	1	1	1	4

21/09/2021

21/9/2021

21/9/2021

21.9.21

Entrance Exam 2021 Answer Key held on dated 21/09/2021 at 10:00 am

Subjects of Life Sciences

Question No.	A	B	C	D
51	1	3	1	3
52	3	3	4	2
53	2	1	2	4
54	4	2	2	2
55	4	4	3	2
56	1	2	4	3
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93	3	1	2	1
94	4	3	4	4
95	1	4	4	4
96	2	4	1	4
97	1	4	1	3
98	1	2	4	3
99	3	4	4	2
100	4	4	1	2

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Total No. of Printed Pages : 21

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

B

SET-X

PG-EE-2021

SUBJECT : Life Sciences

12494

Sr. No. .....

Time : **1¼ Hours** Max. Marks : **100** Total Questions : **100**

Roll No. (in figures)_____(in words)_____

Name_____Date of Birth_____

Father's Name_____Mother's Name_____

Date of Examination_____

_____ _____

(Signature of the Candidate) (Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

1. ***All questions are compulsory.***
2. The candidates ***must return*** the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
4. Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case will be considered.
5. The candidate ***must not*** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers ***must not*** be ticked in the question booklet.
6. ***There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.***
7. Use only **Black** or **Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.
8. *Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained* **30** *minutes after starting of the examination.*

1. Cytokines are produced by cells of the immune system in response to various physiological stimuli that :

(1) modulate cell function through subsequent cell differentiation or cell proliferation.

(2) facilitate cell lysis.

(3) cause glycosylation of immunoglobulins.

(4) cause histamine release.

2. In what way, if any, does the chromosomal determination of sex differ in Drosophila and humans ?

(1) In humans, the Y-chromosome determines maleness, with female development being a default process, but in Drosophila, the presence of two X-chromosomes determines femaleness, and male development is the default process.

(2) In humans, the Y-chromosome determines maleness, but in Drosophila, the ratio of X-chromosomes to autosomes determines maleness or femaleness.

(3) In humans, it is the presence of only one X-chromosome that triggers male development and two X-chromosomes trigger female development, just as occurs in Drosophila.

(4) In human males, a single Y-chromosome is present in the absence of an X-chromosome, while in Drosophila, a single X-chromosome is present in the absence of a Y-chromosome.

3. How many generations are present in the seed of gymnosperm ?

(1) 2 (2) 3

(3) 1 (4) 4

4. Bryophytes are ***not*** characterised by :

(1) Sporophyte parasitic over gametophyte

(2) Independent gametophyte

(3) Absence of vascular tissues

(4) Independent sporophyte

5. Stems and leaves of bryophytes are :

(1) Analogous to vascular plants

(2) Homologous to vascular plants

(3) Analogous to algae & fungal thallus

(4) None of these

6. The dominant photosynthetic phase in the life-cycle of pteridophyta is equivalent to the :

(1) Gametophytic phase of bryophyta

(2) Sporophytic phase of bryophyta

(3) Gametophytic phase of pteridophytes

(4) Gametophytic phase of gymnosperm

7. In Pteridophytes, reduction division occurs when :

(1) Prothallus is formed

(2) Sex organs are formed

(3) Spores are formed

(4) Gametes are formed

8. In which of the following gametophyte is not independent free living ?

(1) Pinus

(2) Funaria

(3) Marchantia

(4) Pteris

9. Seasonal activity of vascular cambium is influenced by many factors, except :

(1) Geographical location of plant

(2) Relative humidity and temperature

(3) Photoperiod and water supply

(4) Leaf orientation

10. When secondary growth is initiated in dicot stem, what will happen first ?

(1) The cells of cambium divide periclinally to form xylem mother cells

(2) Interfascicular cambium join with intrafascicular cambium

(3) Parenchymatous cells present between vascular bundles become meristematic

(4) Pith get obliterated

11. Which one of the following organisms is scientifically correctly named, correctly Printed according to the International Rules of Nomenclature and correctly described ?

(1) E.coli – Full name Entamoeba coli, a commonly occuring bacterium in human intestine

(2) Musca domestica – The common house lizard, a reptile

(3) Plasmodium falciparum – A protozoan pathogen causing the most serious type of malaria

(4) Felis tigris – The Indian tiger, well protected in Gir forests

12. What is true for mammalia ?

(1) Platypus is oviparous

(2) Bats have feathers

(3) Elephant is ovoviviparous

(4) Diaphragm is absent in them

13. Which of the following character is present in all chordates ?

(1) Diaphragm

(2) Vertebral column

(3) Pharyngeal gill clefts

(4) Dorsal solid nerve cord

14. In which of the following animal post anal tail is found ?

(1) Earthworm

(2) Lower invertebrate

(3) Scorpion

(4) Snake

15. In which of the following notochord is present in embryonic stage ?

(1) All chordate

(2) Some chordates

(3) Vertebrates

(4) Non chordates

16. Given below are four matches of an animal and its kind of respiratory organ :

A. Silver fish – Trachea

B. Scorpion – Book lung

C. Sea squirt – Pharyngeal gills

D. Dolphin – Skin

The correct matches are

(1) A and B

(2) A, B and C

(3) B and D

(4) C and D

17. Which one of the following phyla is correctly matched with its two general characteristics ?

(1) Mollusca – Normally oviparous and development through a trochophore or veliger larva

(2) Arthropoda – Body divided into head, thorax and abdomen and respiration by tracheae

(3) Chordata – Notochord at some stage and separate anal and urinary openings to the outside

(4) Echinodermata – Pentamerous radial symmetry and mostly internal fertilization

18. Which of the following are referred as non-vertebrate chordates ?

(1) Ciona, Ascidia, Amphioxus

(2) Lamprey, Myxine, Shark

(3) Scoliodon, Torpedo, Trygon

(4) Pristis, Branchiostoma, Scyllium doutorostomes?

19. Lateral line sense organs are absent in :

(1) Tadpole larva of frog

(2) Bony fishes

(3) Reptiles

(4) Cartilaginous fishes

20. The termination of gastrulation is indicated by :

(1) closure of neural tube

(2) closure of blastopore

(3) obliteration of archenteron

(4) obliteration of blastocoel

21. All enzymes are proteins except :

(1) Trypsin

(2) Pepsin

(3) Steapsin

(4) Ribozyme and Ribonuclease-P

22. Which of the following is the best evidence for the lock and key theory of enzyme action ?

(1) All isolated enzymes have been identified as protein

(2) Compounds similar in structure to the substrate inhibit the reaction

(3) Enzymes are found in living organisms and speed up certain reaction

(4) Enzymes determine the direction of a reaction

23. Co-enzyme is :

(1) Always a protein

(2) Often a metal

(3) Always an inorganic compound

(4) Often a vitamin

24. A person is eating boiled potato. His food contains :

(1) Cellulose, which can be digested by cellulase

(2) Starch, which cannot be digested

(3) Lactose, which cannot be digested

(4) DNA, which can be digested by pancreatic DNAase

25. Which of the following is a reducing sugar ?

(1) Galactose

(2) Gluconic acid

(3) B-methyl galactoside

(4) Sucrose

26. Which of the following hormones is not secreted by duodenum to inhibit the gastric motility ?

(1) GIP

(2) Enterogastrone

(3) Secretin

(4) Enterokinase

27. In case of vertebrates, lacteals are found in :

(1) Oesophagus

(2) Ear

(3) Small intestine

(4) Ischium

28. The movement of ions against the concentration gradient will be :

(1) Active transport

(2) Osmosis

(3) Diffusion

(4) All of these

29. Vomiting centre is located in the :

(1) Medulla oblongata

(2) Stomach and sometimes in duodenum

(3) GI tract

(4) Hypothalamus

30. Which one of the following vitamins can be synthesised by bacteria inside the gut ?

(1) D (2) A

(3) B_1 (4) C

31. In history of biology, human genome project led to the development of :

(1) Bioinformatics

(2) Eugeneics

(3) Biotechnology

(4) Genetic engineering

32. If there are 999 bases in an RNA that codes for a protein with 333 amino acids and the base at position 901 is deleted such that the length of the RNA becomes 998 bases, how many codons will bealtered ?

(1) 1 (2) 11

(3) 33 (4) 333

33. The final proof for DNA as the genetic material came from the experiments of :

(1) Griffith

(2) Hershey and Chase

(3) Avery, Mcleod and McCarty

(4) Hargobind Khurana

34. Which one of the following is not a gaseous biogeochemical cycle in ecosystem ?

(1) Nitrogen cycle

(2) Carbon cycle

(3) Sulphur cycle

(4) Phosphorus cycle

35. Which of the following ecological pyramids is generally inverted ?

(1) Pyramid of numbers in grassland

(2) Pyramid of energy

(3) Pyramid of biomass in a forest

(4) Pyramid of biomass in a sea

36. What type of ecological pyramid would be obtained with the following data ?

Secondary consumer : 120 g

Primary consumer : 60g

Primary producer : 10 g

(1) Inverted pyramid of biomass

(2) Pyramid of energy

(3) Upright pyramid of biomass

(4) Upright pyramid of numbers

37. Which ecosystem has the maximum biomass ?

(1) Forest ecosystem

(2) Grassland ecosystem

(3) Pond ecosystem

(4) Lake ecosystem

38. Limit of BOD prescribed by Central Pollution Control Board for the discharge of industrial and municipal waste water into natural surface water, is :

(1) < 3.0 ppm
(2) < 10 ppm
(3) < 100 ppm
(4) < 30 ppm

39. More than 70% of world's freshwater is contained in :

(1) Antarctica
(2) Glaciers and Mountains
(3) Greenland
(4) Polar ice

40. The process by which organisms with different evolutionary history evolve similar phenotypic adaptations in response to a common environmental challenge, is called :

(1) Convergent evolution
(2) Non-random evolution
(3) Adaptive radiation
(4) Natural selection

41. Select a correct match :

(1) GA, – Early seed production in conifers
(2) Cytokinin – Synchronise fruit set in pineapples
(3) Auxin – Overcomes senescence
(4) Ethylene – Seed maturation and development

42. Where is the respiratory electron transport system (ETS) located in plants ?

(1) Intermembrane space
(2) Mitochondrial matrix
(3) Outer mitochondrial membrane
(4) Inner mitochondrial membrane

43. Respiratory Quotient (RQ) value of tripalmitin is :

(1) 0.9

(2) 0.7

(3) 0.07

(4) 0.09

44. Conversion of glucose to glucose-6-phosphate, the first irreversible reaction of glycolysis, is catalyzed by :

(1) Aldolase

(2) Hexokinase

(3) Enolase

(4) Phosphofructokinase

45. How many ATP molecules will be produced in muscles by aerobic oxidation of one molecule of glucose ?

(1) 2

(2) 4

(3) 36

(4) 34

46. Plants, but not animals, can convert fatty acids to sugars by a series of reactions called :

(1) Photosynt

(2) Krebs cycle

(3) Glycolysis

(4) Glyoxylate cycle

47. Pasteurization is a process, which means heating of drinks. It is carried out, at what temperature and for how much duration ?

(1) 70°C and 60 minutes

(2) 80°C and 30 minutes

(3) 120°C and 60 minutes

(4) 60-70°C and 30 minutes

48. Lenticels are involved in :

(1) Gaseous exchange
(2) Food Transport
(3) Photosynthesis
(4) Transpiration

49. Guttation is the result of :

(1) Osmosis
(2) Root pressure
(3) Diffusion
(4) Transpiration

50. Photosynthetic Active Radiation (PAR) has the following range of wavelengths :

(1) 400-700 nm
(2) 450-950 nm
(3) 340-450 nm
(4) 500-600 nm

51. Select one of the following of important features distinguishing Gnetum from Cycas and Pinus and showing affinities with angiosperms :

(1) Embryo development and apical meristem
(2) Absence of resin duct and leaf venation
(3) Presence of vessel elements and absence of archegonia
(4) Perianth and two integuments

52. Which one of the following is heterosporous ?

(1) Equisetum
(2) Dryopteris
(3) Salvinia
(4) Adiantum

53. A system of classification, in which a large number of traits are considered, is :

(1) Natural system
(2) Phylogenetic system
(3) Artificial system
(4) Synthetic system

54. The book 'Genera plantarum' was written by :

(1) Engler & Prantl
(2) Bentham & Hooker
(3) Bessey
(4) Hutchinson

55. Phylogenetic classification is one which is based on :

(1) Overall similarities
(2) Utilitarian system
(3) Habits of plants
(4) Common evolutionary descent

56. Endosperm of gymnosperm is ontogenetically similar to angiospermic :

(1) Endosperm
(2) Embryo sac
(3) Archegonium
(4) Megasporangia

57. Flowering plants are more successful than other members of the plant world because :

(1) They are large and have a good vascular tissue system
(2) They carry out variety of pollination mechanism
(3) The protected plant embryo can survive in the period of unfavourable conditions
(4) All of these

58. A. Heterospory is found in all members of pteropsida :

B. Selaginella is advance among pteridophytes as it produces seeds

C. Pinus leaves are monomorphic, pinnate compound and have sunken stomata as adaptation against transpiration

D. Sporic meiosis is characteristic of life cycle in many organisms like Volvox, Chlamydomonas and Ulothrix.

(1) All are incorrect
(2) Both B and C are correct
(3) Only B is correct
(4) Only D is incorrect

59. Which phytohormone is synthesised in ripened fruits ?

(1) ABA
(2) Auxin
(3) Cytokinin
(4) Ethylene

60. Which of the following is incorrect about ethylene ?

(1) Promotes root hair formation

(2) It is natural and derivative of carotenoids

(3) It increases the number of female flowers

(4) It causes synchronisation of flowering and fruit set in pineapples

61. The C 4 plants are photosynthetically more efficient than C 3 plants because :

(1) They have more chloroplasts

(2) The CO_2 compensation point is more

(3) CO_2 generated during photorespiration is trapped and recycled through PEP carboxylase

(4) The CO_2 efflux is not prevented

62. The frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes was explained by :

(1) T.H. Morgan

(2) Gregor J. Mendel

(3) Alfred Sturtevant

(4) Sutton Boveri

63. What is the genetic disorder in which an individual has an overall masculine development gynaecomastia, and is sterile ?

(1) Turner's syndrome

(2) Klinefelter's syndrome

(3) Edward syndrome

(4) Down's syndrome

64. A woman has an X-linked condition on one of her X chromosomes. This chromosome can be inherited by :

(1) Only daughters

(2) Only sons

(3) Both sons and daughters

(4) Only grandchildren

65. Which one of the following discoveries resulted in a Nobel Prize ?

(1) X-rays induce sex-linked recessive lethal mutations

(2) Cytoplasmic inheritance

(3) Recombination of linked genes

(4) Genetic engineering

66. Normally DNA molecule has A-T, G-C pairing. However, these bases can exist in alternative valency status owing to rearrangements called :

(1) Frame-shift mutation (2) Tautomerisational mutation

(3) Analog substitution (4) Point mutation

67. The most striking example of point mutation is found in a disease called :

(1) Down's syndrome (2) Sickle cell anaemia

(3) Edward syndrome (4) Night blindness

68. When two genetic loci produce identical phenotypes in cis and trans position, they are considered to be :

(1) Multiple alleles

(2) The parts of same gene

(3) Pseudoalleles

(4) Different genes

69. What map unit (Centimorgan) is adopted in the construction of genetic maps ?

(1) A unit of distance between two expressed genes representing 10% cross over

(2) A unit of distance between two expressed genes representing 100% cross over

(3) A unit of distance between genes an chromosomes, representing 1 % cross over

(4) A unit of distance between genes on chromosomes, representing 50% cross over

70. Expressed Sequence Tags (ESTS) refers to :

(1) Genes expressed as RNA (2) Polypeptide expression

(3) DNA polymorphism (4) Novel DNA sequences

71. The tendency of population to remain in genetic equilibrium may be disturbed by :

(1) Lack of migration
(2) Lack of mutations
(3) Lack of random mating
(4) Random mating

72. The two antibiotic resistance genes on vector pBR322 are for :

(1) Tetracycline and Kanamycin
(2) Ampicillin and Tetracycline
(3) Ampicillin and Chloramphenicol
(4) Chloramphenicol and Tetracycline

73. Which one of the following equipments is essentially required for growing microbes on a large scale, for industrial production of enzymes ?

(1) BOD incubator
(2) Sludge digester
(3) Industrial oven
(4) Bioreactor

74. DNA precipitation out of a mixture of biomolecules can be achieved by treatment with :

(1) Isopropanol
(2) Chilled ethanol
(3) Methanol at room temperature
(4) Chilled chloroform

75. Following statements describe the characteristics of the enzyme Restriction Endonuclease. Identify the incorrect statement.

(1) The enzyme cuts DNA molecule at identified position within the DNA.
(2) The enzyme binds DNA at specific sites and cuts only one of the two strands.
(3) The enzyme cuts the sugar-phosphate backbone at specific sites on each strand.
(4) The enzyme recognizes a specific palindromic nucleotide sequence in the DNA.

76. The correct order of steps in Polymerase Chain Reaction (PCR) is :

(1) Extension, Denaturation, Annealing

(2) Annealing, Extension, Denaturation

(3) Denaturation, Annealing, Extension

(4) Denaturation, Extension, Annealing

77. Enzyme used in ELISA test is :

(1) Endonuclease

(2) Ligase

(3) Peroxidase

(4) Polymerase

78. What will be the pCO_2 and pO_2 in atmospheric air as compared to alveoli respectively ?

(1) Low and high

(2) High and low

(3) High and high

(4) Low and low

79. In ureotelic animals, urea is formed by :

(1) Kreb's cycle

(2) EM pathway

(3) Ornithine cycle

(4) Cori's cycle

80. Which one of the following mammalian cells is not capable of metabolising glucose to carbon-dioxide aerobically ?

(1) Red blood cells

(2) White blood cells

(3) Unstriated muscle cells

(4) Liver cells

81. All the following may be methods for the inhibition of microbial growth by antibiotics except :

(1) Antibiotics disrupt cell wall synthesis.

(2) Antibiotics interfere with cell membrane function.

(3) Antibiotics prevent the release of energy from ATP.

(4) Antibiotics inhibit the synthesis of protein.

82. In which of the following would you place the plants having vascular tissue lacking seeds ?

(1) Pteridophytes

(2) Gymnosperms

(3) Bryophytes

(4) Algae

83. Apomixis is a type of reproduction in plants in which ?

(1) Fertilization does not take place.

(2) Male nucleus takes part in fertilization.

(3) Embryo formation does not take place.

(4) Generative nucleus takes part in fertilization.

84. From which of the following algae, agar is commercially extracted ?

(A) Gracillaria

(B) Fucus

(C) Sargassum

(D) Gelidium

(E) Turbinaria

(1) C and E

(2) B and C

(3) D and E

(4) A and D

85. In which one of the following pairs of diseases is viral as well as transmitted by mosquitoes ?

(1) Elephantiasis and dengue
(2) Yellow fever and sleeping sickness
(3) Encephalitis and sleeping sickness
(4) Yellow fever and dengue

86. A free living nitrogen-fixing cyanobacterium which can also form symbiotic association with the water fern Azolla is :

(1) Tolypothrix
(2) Nostoc
(3) Chlorella
(4) Anabaena

87. Ionophores are :

(1) the gating mechanisms associated with the transport of ions.
(2) intrinsic proteins that passively transport ions.
(3) chemicals that form pores in the plasma membrane and allow ions to cros.
(4) intrinsic proteins that actively transport ions.

88. The trans Golgi network is :

(1) the intermediate compartment between the ER and the Golgi.
(2) the part of the Golgi where fusion of vesicles from the ER occurs.
(3) where sorting of proteins to the lysosomes, plasma membrane and cell exterior occurs.
(4) the network of vesicles that transport proteins between Golgi cisternae.

89. Most human cells are diploid with total DNA content of 2C. The DNA content increases to 4C before the onset of mitosis. At anaphase, the DNA content of each cluster will be :

(1) 4C
(2) 2C
(3) 1C
(4) 3C

90. Malignant cancer cells have all of the following properties except :

(1) unregulated cell division
(2) inhibition of angiogenesis
(3) resistance to apoptosis
(4) cellular immortality

91. Which one of the following is a protein deficiency disease ?

(1) Kwashiorkor
(2) Night blindness
(3) Eczema
(4) Cirrhosis

92. Which of the following statement is incorrect wrt inbreeding ?

(1) Inbreeding increases homozygosity
(2) Inbreeding exposes harmful recessive gene that are eliminated by selection
(3) Inbreeding helps in accumulation of deleterious alleles and elimination of desirable alleles
(4) Inbreeding helps in developing a pure-line animal

93. What is correct to say about the hormone action in humans ?

(1) In females, FSH first binds with specific receptors on ovarian cell membrane
(2) FSH stimulates the secretion of estrogen and progesterone
(3) Glucagon is secreted by B-cells of Islets of langerhans and stimulates glycogenolysis
(4) Secretion of thymosins is stimulated with aging

94. Body having meshwork of cells, internal cavities lined with food filtering flagellated cells and indirect development are the characteristics of phylum :

(1) Protozoa
(2) Coelenterata
(3) Porifera
(4) Mollusca

95. Which of the following characteristics is mainly responsible for diversification of insects on land ?

(1) Eyes
(2) Segmentation
(3) Bilateral symmetry
(4) Exoskeleton

96. Which of the following endoparasites of humans does show viviparity ?

(1) Ascaris lumbricoides
(2) Ancylostoma duodenale
(3) Enterobius vermicularis
(4) Trichinella spiralis

97. Select the Taxon mentioned which represents both marine and fresh water species.

(1) Echinoderms
(2) Ctenophora
(3) Cephalochordata
(4) Cnidaria

98. Which one of the following living organisms completely lacks a cell wall ?

(1) Cyanobacteria
(2) Sea-fan(Gorgonia)
(3) Saccharomyces
(4) Blue-green algae

99. Biological organisation starts with :

(1) Cellular level
(2) Organismic level
(3) Atomic level
(4) Submicroscopic molecular level

100. Peripatus is a connecting link between :

(1) Coelenterata and Porifera
(2) Ctenophora and Platyhelminthis
(3) Mollusca and Echinodermata
(4) Annelida and Arthropoda

Entrance Exam 2021 Answer Key held on dated 21/09/2021 at 10:00 am

Subjects of Life Sciences

Question No.	A	B	C	D
1	3	1	1	4
2	1	2	3	2
3	1	2	2	4
4	4	4	3	4
5	4	1	1	1
6	4	1	2	4
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8	3	1	3	1
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45	1	3	2	1
46	2	4	3	2
47	2	4	3	1
48	3	1	1	1
49	3	2	3	3
50	1	1	1	4

21/09/2021

21/9/2021

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21.9.21

Entrance Exam 2021 Answer Key held on dated 21/09/2021 at 10:00 am

Subjects of Life Sciences

Question No.	A	B	C	D
51	1	3	1	3
52	3	3	4	2
53	2	1	2	4
54	4	2	2	2
55	4	4	3	2
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87	4	3	3	4
88	2	3	1	1
89	4	2	4	4
90	4	2	3	2
91	3	1	1	3
92	1	3	3	1
93	3	1	2	1
94	4	3	4	4
95	1	4	4	4
96	2	4	1	4
97	1	4	1	3
98	1	2	4	3
99	3	4	4	2
100	4	4	1	2

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Total No. of Printed Pages : 21

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C

SET-X

PG-EE-2021

SUBJECT : Life Sciences

12491

Sr. No. .....

Time : **1¼ Hours** Max. Marks : **100** Total Questions : **100**

Roll No. (in figures)_____(in words)_____

Name_____Date of Birth_____

Father's Name_____Mother's Name_____

Date of Examination_____

_____ _____

(Signature of the Candidate) (Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

1. ***All questions are compulsory.***
2. The candidates ***must return*** the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
4. Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case will be considered.
5. The candidate ***must not*** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers ***must not*** be ticked in the question booklet.
6. ***There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.***
7. Use only **Black** or **Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.
8. *Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained* **30** *minutes after starting of the examination.*

1. The C 4 plants are photosynthetically more efficient than C 3 plants because :

   (1) They have more chloroplasts

   (2) The CO_2 compensation point is more

   (3) CO_2 generated during photorespiration is trapped and recycled through PEP carboxylase

   (4) The CO_2 efflux is not prevented

2. The frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes was explained by :

   (1) T.H. Morgan

   (2) Gregor J. Mendel

   (3) Alfred Sturtevant

   (4) Sutton Boveri

3. What is the genetic disorder in which an individual has an overall masculine development gynaecomastia, and is sterile ?

   (1) Turner's syndrome (2) Klinefelter's syndrome

   (3) Edward syndrome (4) Down's syndrome

4. A woman has an X-linked condition on one of her X chromosomes. This chromosome can be inherited by :

   (1) Only daughters (2) Only sons

   (3) Both sons and daughters (4) Only grandchildren

5. Which one of the following discoveries resulted in a Nobel Prize ?

   (1) X-rays induce sex-linked recessive lethal mutations

   (2) Cytoplasmic inheritance

   (3) Recombination of linked genes

   (4) Genetic engineering

6. Normally DNA molecule has A-T, G-C pairing. However, these bases can exist in alternative valency status owing to rearrangements called :

(1) Frame-shift mutation
(2) Tautomerisational mutation
(3) Analog substitution
(4) Point mutation

7. The most striking example of point mutation is found in a disease called :

(1) Down's syndrome
(2) Sickle cell anaemia
(3) Edward syndrome
(4) Night blindness

8. When two genetic loci produce identical phenotypes in cis and trans position, they are considered to be :

(1) Multiple alleles
(2) The parts of same gene
(3) Pseudoalleles
(4) Different genes

9. What map unit (Centimorgan) is adopted in the construction of genetic maps ?

(1) A unit of distance between two expressed genes representing 10% cross over
(2) A unit of distance between two expressed genes representing 100% cross over
(3) A unit of distance between genes an chromosomes, representing 1 % cross over
(4) A unit of distance between genes on chromosomes, representing 50% cross over

10. Expressed Sequence Tags (ESTS) refers to :

(1) Genes expressed as RNA
(2) Polypeptide expression
(3) DNA polymorphism
(4) Novel DNA sequences

11. Select one of the following of important features distinguishing Gnetum from Cycas and Pinus and showing affinities with angiosperms :

(1) Embryo development and apical meristem
(2) Absence of resin duct and leaf venation
(3) Presence of vessel elements and absence of archegonia
(4) Perianth and two integuments

12. Which one of the following is heterosporous ?

(1) Equisetum

(2) Dryopteris

(3) Salvinia

(4) Adiantum

13. A system of classification, in which a large number of traits are considered, is :

(1) Natural system

(2) Phylogenetic system

(3) Artificial system

(4) Synthetic system

14. The book 'Genera plantarum' was written by :

(1) Engler & Prantl

(2) Bentham & Hooker

(3) Bessey

(4) Hutchinson

15. Phylogenetic classification is one which is based on :

(1) Overall similarities

(2) Utilitarian system

(3) Habits of plants

(4) Common evolutionary descent

16. Endosperm of gymnosperm is ontogenetically similar to angiospermic :

(1) Endosperm

(2) Embryo sac

(3) Archegonium

(4) Megasporangia

17. Flowering plants are more successful than other members of the plant world because :

(1) They are large and have a good vascular tissue system

(2) They carry out variety of pollination mechanism

(3) The protected plant embryo can survive in the period of unfavourable conditions

(4) All of these

18. A. Heterospory is found in all members of pteropsida :

B. Sclaginella is advance among pteridophytes as it produces seeds

C. Pinus leaves are monomorphic, pinnate compound and have sunken stomata as adaptation against transpiration

D. Sporic meiosis is characteristic of life cycle in many organisms like Volvox, Chlamydomonas and Ulothrix.

(1) All are incorrect
(2) Both B and C are correct
(3) Only B is correct
(4) Only D is incorrect

19. Which phytohormone is synthesised in ripened fruits ?

(1) ABA
(2) Auxin
(3) Cytokinin
(4) Ethylene

20. Which of the following is incorrect about ethylene ?

(1) Promotes root hair formation
(2) It is natural and derivative of carotenoids
(3) It increases the number of female flowers
(4) It causes synchronisation of flowering and fruit set in pineapples

21. All the following may be methods for the inhibition of microbial growth by antibiotics except :

(1) Antibiotics disrupt cell wall synthesis.
(2) Antibiotics interfere with cell membrane function.
(3) Antibiotics prevent the release of energy from ATP.
(4) Antibiotics inhibit the synthesis of protein.

22. In which of the following would you place the plants having vascular tissue lacking seeds ?

(1) Pteridophytes
(2) Gymnosperms
(3) Bryophytes
(4) Algae

23. Apomixis is a type of reproduction in plants in which ?

(1) Fertilization does not take place.

(2) Male nucleus takes part in fertilization.

(3) Embryo formation does not take place.

(4) Generative nucleus takes part in fertilization.

24. From which of the following algae, agar is commercially extracted ?

(A) Gracillaria

(B) Fucus

(C) Sargassum

(D) Gelidium

(E) Turbinaria

(1) C and E

(2) B and C

(3) D and E

(4) A and D

25. In which one of the following pairs of diseases is viral as well as transmitted by mosquitoes ?

(1) Elephantiasis and dengue

(2) Yellow fever and sleeping sickness

(3) Encephalitis and sleeping sickness

(4) Yellow fever and dengue

26. A free living nitrogen-fixing cyanobacterium which can also form symbiotic association with the water fern Azolla is :

(1) Tolypothrix (2) Nostoc

(3) Chlorella (4) Anabaena

27. Ionophores are :

(1) the gating mechanisms associated with the transport of ions.

(2) intrinsic proteins that passively transport ions.

(3) chemicals that form pores in the plasma membrane and allow ions to cros.

(4) intrinsic proteins that actively transport ions.

28. The trans Golgi network is :

(1) the intermediate compartment between the ER and the Golgi.

(2) the part of the Golgi where fusion of vesicles from the ER occurs.

(3) where sorting of proteins to the lysosomes, plasma membrane and cell exterior occurs.

(4) the network of vesicles that transport proteins between Golgi cisternae.

29. Most human cells are diploid with total DNA content of 2C. The DNA content increases to 4C before the onset of mitosis. At anaphase, the DNA content of each cluster will be :

(1) 4C

(2) 2C

(3) 1C

(4) 3C

30. Malignant cancer cells have all of the following properties except :

(1) unregulated cell division

(2) inhibition of angiogenesis

(3) resistance to apoptosis

(4) cellular immortality

31. Which one of the following organisms is scientifically correctly named, correctly Printed according to the International Rules of Nomenclature and correctly described ?

(1) E.coli – Full name Entamoeba coli, a commonly occuring bacterium in human intestine

(2) Musca domestica – The common house lizard, a reptile

(3) Plasmodium falciparum – A protozoan pathogen causing the most serious type of malaria

(4) Felis tigris – The Indian tiger, well protected in Gir forests

32. What is true for mammalia ?

(1) Platypus is oviparous

(2) Bats have feathers

(3) Elephant is ovoviviparous

(4) Diaphragm is absent in them

33. Which of the following character is present in all chordates ?

(1) Diaphragm

(2) Vertebral column

(3) Pharyngeal gill clefts

(4) Dorsal solid nerve cord

34. In which of the following animal post anal tail is found ?

(1) Earthworm

(2) Lower invertebrate

(3) Scorpion

(4) Snake

35. In which of the following notochord is present in embryonic stage ?

(1) All chordate

(2) Some chordates

(3) Vertebrates

(4) Non chordates

36. Given below are four matches of an animal and its kind of respiratory organ :

A. Silver fish – Trachea

B. Scorpion – Book lung

C. Sea squirt – Pharyngeal gills

D. Dolphin – Skin

The correct matches are

(1) A and B

(2) A, B and C

(3) B and D

(4) C and D

37. Which one of the following phyla is correctly matched with its two general characteristics ?

(1) Mollusca – Normally oviparous and development through a trochophore or veliger larva

(2) Arthropoda – Body divided into head, thorax and abdomen and respiration by tracheae

(3) Chordata – Notochord at some stage and separate anal and urinary openings to the outside

(4) Echinodermata – Pentamerous radial symmetry and mostly internal fertilization

38. Which of the following are referred as non-vertebrate chordates ?

(1) Ciona, Ascidia, Amphioxus

(2) Lamprey, Myxine, Shark

(3) Scoliodon, Torpedo, Trygon

(4) Pristis, Branchiostoma, Scyllium doutorostomes?

39. Lateral line sense organs are absent in :

(1) Tadpole larva of frog

(2) Bony fishes

(3) Reptiles

(4) Cartilaginous fishes

40. The termination of gastrulation is indicated by :

(1) closure of neural tube

(2) closure of blastopore

(3) obliteration of archenteron

(4) obliteration of blastocoel

41. The tendency of population to remain in genetic equilibrium may be disturbed by :

(1) Lack of migration

(2) Lack of mutations

(3) Lack of random mating

(4) Random mating

42. The two antibiotic resistance genes on vector pBR322 are for :

(1) Tetracycline and Kanamycin

(2) Ampicillin and Tetracycline

(3) Ampicillin and Chloramphenicol

(4) Chloramphenicol and Tetracycline

43. Which one of the following equipments is essentially required for growing microbes on a large scale, for industrial production of enzymes ?

(1) BOD incubator

(2) Sludge digester

(3) Industrial oven

(4) Bioreactor

44. DNA precipitation out of a mixture of biomolecules can be achieved by treatment with :

(1) Isopropanol

(2) Chilled ethanol

(3) Methanol at room temperature

(4) Chilled chloroform

45. Following statements describe the characteristics of the enzyme Restriction Endonuclease. Identify the incorrect statement.

(1) The enzyme cuts DNA molecule at identified position within the DNA.

(2) The enzyme binds DNA at specific sites and cuts only one of the two strands.

(3) The enzyme cuts the sugar-phosphate backbone at specific sites on each strand.

(4) The enzyme recognizes a specific palindromic nucleotide sequence in the DNA.

46. The correct order of steps in Polymerase Chain Reaction (PCR) is :

(1) Extension, Denaturation, Annealing

(2) Annealing, Extension, Denaturation

(3) Denaturation, Annealing, Extension

(4) Denaturation, Extension, Annealing

47. Enzyme used in ELISA test is :

(1) Endonuclease

(2) Ligase

(3) Peroxidase

(4) Polymerase

48. What will be the pCO_2 and pO_2 in atmospheric air as compared to alveoli respectively ?

(1) Low and high

(2) High and low

(3) High and high

(4) Low and low

49. In ureotelic animals, urea is formed by :

(1) Kreb's cycle

(2) EM pathway

(3) Ornithine cycle

(4) Cori's cycle

50. Which one of the following mammalian cells is not capable of metabolising glucose to carbon-dioxide aerobically ?

(1) Red blood cells

(2) White blood cells

(3) Unstriated muscle cells

(4) Liver cells

51. Select a correct match :

(1) GA, – Early seed production in conifers

(2) Cytokinin – Synchronise fruit set in pineapples

(3) Auxin – Overcomes senescence

(4) Ethylene – Seed maturation and development

52. Where is the respiratory electron transport system (ETS) located in plants ?

(1) Intermembrane space

(2) Mitochondrial matrix

(3) Outer mitochondrial membrane

(4) Inner mitochondrial membrane

53. Respiratory Quotient (RQ) value of tripalmitin is :

(1) 0.9

(2) 0.7

(3) 0.07

(4) 0.09

54. Conversion of glucose to glucose-6-phosphate, the first irreversible reaction of glycolysis, is catalyzed by :

(1) Aldolase

(2) Hexokinase

(3) Enolase

(4) Phosphofructokinase

55. How many ATP molecules will be produced in muscles by aerobic oxidation of one molecule of glucose ?

(1) 2 (2) 4

(3) 36 (4) 34

56. Plants, but not animals, can convert fatty acids to sugars by a series of reactions called :

(1) Photosynt

(2) Krebs cycle

(3) Glycolysis

(4) Glyoxylate cycle

57. Pasteurization is a process, which means heating of drinks. It is carried out, at what temperature and for how much duration ?

(1) 70°C and 60 minutes

(2) 80°C and 30 minutes

(3) 120°C and 60 minutes

(4) 60-70°C and 30 minutes

58. Lenticels are involved in :

(1) Gaseous exchange (2) Food Transport

(3) Photosynthesis (4) Transpiration

59. Guttation is the result of :

(1) Osmosis (2) Root pressure

(3) Diffusion (4) Transpiration

60. Photosynthetic Active Radiation (PAR) has the following range of wavelengths :

(1) 400-700 nm

(2) 450-950 nm

(3) 340-450 nm

(4) 500-600 nm

61. All enzymes are proteins except :

(1) Trypsin

(2) Pepsin

(3) Steapsin

(4) Ribozyme and Ribonuclease-P

62. Which of the following is the best evidence for the lock and key theory of enzyme action ?

(1) All isolated enzymes have been identified as protein

(2) Compounds similar in structure to the substrate inhibit the reaction

(3) Enzymes are found in living organisms and speed up certain reaction

(4) Enzymes determine the direction of a reaction

63. Co-enzyme is :

(1) Always a protein

(2) Often a metal

(3) Always an inorganic compound

(4) Often a vitamin

64. A person is eating boiled potato. His food contains :

(1) Cellulose, which can be digested by cellulase

(2) Starch, which cannot be digested

(3) Lactose, which cannot be digested

(4) DNA, which can be digested by pancreatic DNAase

65. Which of the following is a reducing sugar ?

(1) Galactose

(2) Gluconic acid

(3) B-methyl galactoside

(4) Sucrose

66. Which of the following hormones is not secreted by duodenum to inhibit the gastric motility ?

(1) GIP

(2) Enterogastrone

(3) Secretin

(4) Enterokinase

67. In case of vertebrates, lacteals are found in :

(1) Oesophagus

(2) Ear

(3) Small intestine

(4) Ischium

68. The movement of ions against the concentration gradient will be :

(1) Active transport

(2) Osmosis

(3) Diffusion

(4) All of these

69. Vomiting centre is located in the :

(1) Medulla oblongata

(2) Stomach and sometimes in duodenum

(3) GI tract

(4) Hypothalamus

70. Which one of the following vitamins can be synthesised by bacteria inside the gut ?

(1) D

(2) A

(3) B_1

(4) C

71. Which one of the following is a protein deficiency disease ?

(1) Kwashiorkor

(2) Night blindness

(3) Eczema

(4) Cirrhosis

72. Which of the following statement is incorrect wrt inbreeding ?

(1) Inbreeding increases homozygosity

(2) Inbreeding exposes harmful recessive gene that are eliminated by selection

(3) Inbreeding helps in accumulation of deleterious alleles and elimination of desirable alleles

(4) Inbreeding helps in developing a pure-line animal

73. What is correct to say about the hormone action in humans ?

(1) In females, FSH first binds with specific receptors on ovarian cell membrane

(2) FSH stimulates the secretion of estrogen and progesterone

(3) Glucagon is secreted by B-cells of Islets of langerhans and stimulates glycogenolysis

(4) Secretion of thymosins is stimulated with aging

74. Body having meshwork of cells, internal cavities lined with food filtering flagellated cells and indirect development are the characteristics of phylum :

(1) Protozoa

(2) Coelenterata

(3) Porifera

(4) Mollusca

75. Which of the following characteristics is mainly responsible for diversification of insects on land ?

(1) Eyes

(2) Segmentation

(3) Bilateral symmetry

(4) Exoskeleton

76. Which of the following endoparasites of humans does show viviparity ?

(1) Ascaris lumbricoides

(2) Ancylostoma duodenale

(3) Enterobius vermicularis

(4) Trichinella spiralis

77. Select the Taxon mentioned which represents both marine and fresh water species.

(1) Echinoderms

(2) Ctenophora

(3) Cephalochordata

(4) Cnidaria

78. Which one of the following living organisms completely lacks a cell wall ?

(1) Cyanobacteria

(2) Sea-fan(Gorgonia)

(3) Saccharomyces

(4) Blue-green algae

79. Biological organisation starts with :

(1) Cellular level

(2) Organismic level

(3) Atomic level

(4) Submicroscopic molecular level

80. Peripatus is a connecting link between :

(1) Coelenterata and Porifera

(2) Ctenophora and Platyhelminthis

(3) Mollusca and Echinodermata

(4) Annelida and Arthropoda

81. Cytokines are produced by cells of the immune system in response to various physiological stimuli that :

(1) modulate cell function through subsequent cell differentiation or cell proliferation.

(2) facilitate cell lysis.

(3) cause glycosylation of immunoglobulins.

(4) cause histamine release.

82. In what way, if any, does the chromosomal determination of sex differ in Drosophila and humans ?

(1) In humans, the Y-chromosome determines maleness, with female development being a default process, but in Drosophila, the presence of two X-chromosomes determines femaleness, and male development is the default process.

(2) In humans, the Y-chromosome determines maleness, but in Drosophila, the ratio of X-chromosomes to autosomes determines maleness or femaleness.

(3) In humans, it is the presence of only one X-chromosome that triggers male development and two X-chromosomes trigger female development, just as occurs in Drosophila.

(4) In human males, a single Y-chromosome is present in the absence of an X-chromosome, while in Drosophila, a single X-chromosome is present in the absence of a Y-chromosome.

83. How many generations are present in the seed of gymnosperm ?

(1) 2 (2) 3

(3) 1 (4) 4

84. Bryophytes are ***not*** characterised by :

(1) Sporophyte parasitic over gametophyte

(2) Independent gametophyte

(3) Absence of vascular tissues

(4) Independent sporophyte

85. Stems and leaves of bryophytes are :

(1) Analogous to vascular plants (2) Homologous to vascular plants

(3) Analogous to algae & fungal thallus (4) None of these

86. The dominant photosynthetic phase in the life-cycle of pteridophyta is equivalent to the :

(1) Gametophytic phase of bryophyta

(2) Sporophytic phase of bryophyta

(3) Gametophytic phase of pteridophytes

(4) Gametophytic phase of gymnosperm

87. In Pteridophytes, reduction division occurs when :

(1) Prothallus is formed (2) Sex organs are formed

(3) Spores are formed (4) Gametes are formed

88. In which of the following gametophyte is not independent free living ?

(1) Pinus (2) Funaria

(3) Marchantia (4) Pteris

89. Seasonal activity of vascular cambium is influenced by many factors, except :

(1) Geographical location of plant

(2) Relative humidity and temperature

(3) Photoperiod and water supply

(4) Leaf orientation

90. When secondary growth is initiated in dicot stem, what will happen first ?

(1) The cells of cambium divide periclinally to form xylem mother cells

(2) Interfascicular cambium join with intrafascicular cambium

(3) Parenchymatous cells present between vascular bundles become meristematic

(4) Pith get obliterated

91. In history of biology, human genome project led to the development of :

(1) Bioinformatics

(2) Eugeneics

(3) Biotechnology

(4) Genetic engineering

92. If there are 999 bases in an RNA that codes for a protein with 333 amino acids and the base at position 901 is deleted such that the length of the RNA becomes 998 bases, how many codons will bealtered ?

(1) 1 (2) 11

(3) 33 (4) 333

93. The final proof for DNA as the genetic material came from the experiments of :

(1) Griffith (2) Hershey and Chase

(3) Avery, Mcleod and McCarty (4) Hargobind Khurana

94. Which one of the following is not a gaseous biogeochemical cycle in ecosystem ?

(1) Nitrogen cycle (2) Carbon cycle

(3) Sulphur cycle (4) Phosphorus cycle

95. Which of the following ecological pyramids is generally inverted ?

(1) Pyramid of numbers in grassland

(2) Pyramid of energy

(3) Pyramid of biomass in a forest

(4) Pyramid of biomass in a sea

96. What type of ecological pyramid would be obtained with the following data ?

Secondary consumer : 120 g

Primary consumer : 60g

Primary producer : 10 g

(1) Inverted pyramid of biomass

(2) Pyramid of energy

(3) Upright pyramid of biomass

(4) Upright pyramid of numbers

97. Which ecosystem has the maximum biomass ?

(1) Forest ecosystem

(2) Grassland ecosystem

(3) Pond ecosystem

(4) Lake ecosystem

98. Limit of BOD prescribed by Central Pollution Control Board for the discharge of industrial and municipal waste water into natural surface water, is :

(1) < 3.0 ppm

(2) < 10 ppm

(3) < 100 ppm

(4) < 30 ppm

99. More than 70% of world's freshwater is contained in :

(1) Antarctica

(2) Glaciers and Mountains

(3) Greenland

(4) Polar ice

100. The process by which organisms with different evolutionary history evolve similar phenotypic adaptations in response to a common environmental challenge, is called :

(1) Convergent evolution

(2) Non-random evolution

(3) Adaptive radiation

(4) Natural selection

Entrance Exam 2021 Answer Key held on dated 21/09/2021 at 10:00 am

Subjects of Life Sciences

Question No.	A	B	C	D
1	3	1	1	4
2	1	2	3	2
3	1	2	2	4
4	4	4	3	4
5	4	1	1	1
6	4	1	2	4
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44	3	2	2	4
45	1	3	2	1
46	2	4	3	2
47	2	4	3	1
48	3	1	1	1
49	3	2	3	3
50	1	1	1	4

21/09/2021

21/9/2021

21/9/2021

21.9.21

Entrance Exam 2021 Answer Key held on dated 21/09/2021 at 10:00 am

Subjects of Life Sciences

Question No.	A	B	C	D
51	1	3	1	3
52	3	3	4	2
53	2	1	2	4
54	4	2	2	2
55	4	4	3	2
56	1	2	4	3
57	1	4	4	3
58	4	1	1	1
59	4	4	2	3
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79	1	3	4	3
80	3	1	4	1
81	1	3	1	3
82	3	1	2	3
83	1	1	2	1
84	3	4	4	2
85	4	4	1	4
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94	4	3	4	4
95	1	4	4	4
96	2	4	1	4
97	1	4	1	3
98	1	2	4	3
99	3	4	4	2
100	4	4	1	2

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Total No. of Printed Pages : 21

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D

SET-X

PG-EE-2021

SUBJECT : Life Sciences

12492

Sr. No. .....

Time : **1¼ Hours** Max. Marks : **100** Total Questions : **100**

Roll No. (in figures)_____ (in words)_____

Name_____ Date of Birth_____

Father's Name_____ Mother's Name_____

Date of Examination_____

_____ _____

(Signature of the Candidate) (Signature of the Invigilator)

SEAL

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

1. ***All questions are compulsory.***
2. The candidates ***must return*** the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
4. Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case will be considered.
5. The candidate ***must not*** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers ***must not*** be ticked in the question booklet.
6. ***There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.***
7. Use only **Black** or **Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.
8. *Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained* **30** *minutes after starting of the examination.*

1. All enzymes are proteins except :

   (1) Trypsin

   (2) Pepsin

   (3) Steapsin

   (4) Ribozyme and Ribonuclease-P

2. Which of the following is the best evidence for the lock and key theory of enzyme action ?

   (1) All isolated enzymes have been identified as protein

   (2) Compounds similar in structure to the substrate inhibit the reaction

   (3) Enzymes are found in living organisms and speed up certain reaction

   (4) Enzymes determine the direction of a reaction

3. Co-enzyme is :

   (1) Always a protein

   (2) Often a metal

   (3) Always an inorganic compound

   (4) Often a vitamin

4. A person is eating boiled potato. His food contains :

   (1) Cellulose, which can be digested by cellulase

   (2) Starch, which cannot be digested

   (3) Lactose, which cannot be digested

   (4) DNA, which can be digested by pancreatic DNAase

5. Which of the following is a reducing sugar ?

   (1) Galactose

   (2) Gluconic acid

   (3) B-methyl galactoside

   (4) Sucrose

6. Which of the following hormones is not secreted by duodenum to inhibit the gastric motility ?

(1) GIP

(2) Enterogastrone

(3) Secretin

(4) Enterokinase

7. In case of vertebrates, lacteals are found in :

(1) Oesophagus

(2) Ear

(3) Small intestine

(4) Ischium

8. The movement of ions against the concentration gradient will be :

(1) Active transport

(2) Osmosis

(3) Diffusion

(4) All of these

9. Vomiting centre is located in the :

(1) Medulla oblongata

(2) Stomach and sometimes in duodenum

(3) GI tract

(4) Hypothalamus

10. Which one of the following vitamins can be synthesised by bacteria inside the gut ?

(1) D

(2) A

(3) B_1

(4) C

11. In history of biology, human genome project led to the development of :

(1) Bioinformatics

(2) Eugeneics

(3) Biotechnology

(4) Genetic engineering

12. If there are 999 bases in an RNA that codes for a protein with 333 amino acids and the base at position 901 is deleted such that the length of the RNA becomes 998 bases, how many codons will bealtered ?

(1) 1 (2) 11

(3) 33 (4) 333

13. The final proof for DNA as the genetic material came from the experiments of :

(1) Griffith

(2) Hershey and Chase

(3) Avery, Mcleod and McCarty

(4) Hargobind Khurana

14. Which one of the following is not a gaseous biogeochemical cycle in ecosystem ?

(1) Nitrogen cycle (2) Carbon cycle

(3) Sulphur cycle (4) Phosphorus cycle

15. Which of the following ecological pyramids is generally inverted ?

(1) Pyramid of numbers in grassland

(2) Pyramid of energy

(3) Pyramid of biomass in a forest

(4) Pyramid of biomass in a sea

16. What type of ecological pyramid would be obtained with the following data ?

Secondary consumer : 120 g

Primary consumer : 60g

Primary producer : 10 g

(1) Inverted pyramid of biomass

(2) Pyramid of energy

(3) Upright pyramid of biomass

(4) Upright pyramid of numbers

17. Which ecosystem has the maximum biomass ?

(1) Forest ecosystem

(2) Grassland ecosystem

(3) Pond ecosystem

(4) Lake ecosystem

18. Limit of BOD prescribed by Central Pollution Control Board for the discharge of industrial and municipal waste water into natural surface water, is :

(1) < 3.0 ppm

(2) < 10 ppm

(3) < 100 ppm

(4) < 30 ppm

19. More than 70% of world's freshwater is contained in :

(1) Antarctica

(2) Glaciers and Mountains

(3) Greenland

(4) Polar ice

20. The process by which organisms with different evolutionary history evolve similar phenotypic adaptations in response to a common environmental challenge, is called :

(1) Convergent evolution

(2) Non-random evolution

(3) Adaptive radiation

(4) Natural selection

21. Select a correct match :

(1) GA, – Early seed production in conifers

(2) Cytokinin – Synchronise fruit set in pineapples

(3) Auxin – Overcomes senescence

(4) Ethylene – Seed maturation and development

22. Where is the respiratory electron transport system (ETS) located in plants ?

(1) Intermembrane space

(2) Mitochondrial matrix

(3) Outer mitochondrial membrane

(4) Inner mitochondrial membrane

23. Respiratory Quotient (RQ) value of tripalmitin is :

(1) 0.9

(2) 0.7

(3) 0.07

(4) 0.09

24. Conversion of glucose to glucose-6-phosphate, the first irreversible reaction of glycolysis, is catalyzed by :

(1) Aldolase

(2) Hexokinase

(3) Enolase

(4) Phosphofructokinase

25. How many ATP molecules will be produced in muscles by aerobic oxidation of one molecule of glucose ?

(1) 2

(2) 4

(3) 36

(4) 34

26. Plants, but not animals, can convert fatty acids to sugars by a series of reactions called :

(1) Photosynt
(2) Krebs cycle
(3) Glycolysis
(4) Glyoxylate cycle

27. Pasteurization is a process, which means heating of drinks. It is carried out, at what temperature and for how much duration ?

(1) 70°C and 60 minutes
(2) 80°C and 30 minutes
(3) 120°C and 60 minutes
(4) 60-70°C and 30 minutes

28. Lenticels are involved in :

(1) Gaseous exchange
(2) Food Transport
(3) Photosynthesis
(4) Transpiration

29. Guttation is the result of :

(1) Osmosis
(2) Root pressure
(3) Diffusion
(4) Transpiration

30. Photosynthetic Active Radiation (PAR) has the following range of wavelengths :

(1) 400-700 nm
(2) 450-950 nm
(3) 340-450 nm
(4) 500-600 nm

31. Cytokines are produced by cells of the immune system in response to various physiological stimuli that :

(1) modulate cell function through subsequent cell differentiation or cell proliferation.
(2) facilitate cell lysis.
(3) cause glycosylation of immunoglobulins.
(4) cause histamine release.

32. In what way, if any, does the chromosomal determination of sex differ in Drosophila and humans ?

(1) In humans, the Y-chromosome determines maleness, with female development being a default process, but in Drosophila, the presence of two X-chromosomes determines femaleness, and male development is the default process.

(2) In humans, the Y-chromosome determines maleness, but in Drosophila, the ratio of X-chromosomes to autosomes determines maleness or femaleness.

(3) In humans, it is the presence of only one X-chromosome that triggers male development and two X-chromosomes trigger female development, just as occurs in Drosophila.

(4) In human males, a single Y-chromosome is present in the absence of an X-chromosome, while in Drosophila, a single X-chromosome is present in the absence of a Y-chromosome.

33. How many generations are present in the seed of gymnosperm ?

(1) 2 (2) 3

(3) 1 (4) 4

34. Bryophytes are ***not*** characterised by :

(1) Sporophyte parasitic over gametophyte

(2) Independent gametophyte

(3) Absence of vascular tissues

(4) Independent sporophyte

35. Stems and leaves of bryophytes are :

(1) Analogous to vascular plants

(2) Homologous to vascular plants

(3) Analogous to algae & fungal thallus

(4) None of these

36. The dominant photosynthetic phase in the life-cycle of pteridophyta is equivalent to the :

(1) Gametophytic phase of bryophyta

(2) Sporophytic phase of bryophyta

(3) Gametophytic phase of pteridophytes

(4) Gametophytic phase of gymnosperm

37. In Pteridophytes, reduction division occurs when :

(1) Prothallus is formed

(2) Sex organs are formed

(3) Spores are formed

(4) Gametes are formed

38. In which of the following gametophyte is not independent free living ?

(1) Pinus

(2) Funaria

(3) Marchantia

(4) Pteris

39. Seasonal activity of vascular cambium is influenced by many factors, except :

(1) Geographical location of plant

(2) Relative humidity and temperature

(3) Photoperiod and water supply

(4) Leaf orientation

40. When secondary growth is initiated in dicot stem, what will happen first ?

(1) The cells of cambium divide periclinally to form xylem mother cells

(2) Interfascicular cambium join with intrafascicular cambium

(3) Parenchymatous cells present between vascular bundles become meristematic

(4) Pith get obliterated

41. Which one of the following organisms is scientifically correctly named, correctly Printed according to the International Rules of Nomenclature and correctly described ?

(1) E.coli – Full name Entamoeba coli, a commonly occuring bacterium in human intestine

(2) Musca domestica – The common house lizard, a reptile

(3) Plasmodium falciparum – A protozoan pathogen causing the most serious type of malaria

(4) Felis tigris – The Indian tiger, well protected in Gir forests

42. What is true for mammalia ?

(1) Platypus is oviparous

(2) Bats have feathers

(3) Elephant is ovoviviparous

(4) Diaphragm is absent in them

43. Which of the following character is present in all chordates ?

(1) Diaphragm

(2) Vertebral column

(3) Pharyngeal gill clefts

(4) Dorsal solid nerve cord

44. In which of the following animal post anal tail is found ?

(1) Earthworm

(2) Lower invertebrate

(3) Scorpion

(4) Snake

45. In which of the following notochord is present in embryonic stage ?

(1) All chordate

(2) Some chordates

(3) Vertebrates

(4) Non chordates

46. Given below are four matches of an animal and its kind of respiratory organ :

A. Silver fish – Trachea

B. Scorpion – Book lung

C. Sea squirt – Pharyngeal gills

D. Dolphin – Skin

The correct matches are

(1) A and B

(2) A, B and C

(3) B and D

(4) C and D

47. Which one of the following phyla is correctly matched with its two general characteristics ?

(1) Mollusca – Normally oviparous and development through a trochophore or veliger larva

(2) Arthropoda – Body divided into head, thorax and abdomen and respiration by tracheae

(3) Chordata – Notochord at some stage and separate anal and urinary openings to the outside

(4) Echinodermata – Pentamerous radial symmetry and mostly internal fertilization

48. Which of the following are referred as non-vertebrate chordates ?

(1) Ciona, Ascidia, Amphioxus

(2) Lamprey, Myxine, Shark

(3) Scoliodon, Torpedo, Trygon

(4) Pristis, Branchiostoma, Scyllium doutorostomes?

49. Lateral line sense organs are absent in :

(1) Tadpole larva of frog

(2) Bony fishes

(3) Reptiles

(4) Cartilaginous fishes

50. The termination of gastrulation is indicated by :

(1) closure of neural tube

(2) closure of blastopore

(3) obliteration of archenteron

(4) obliteration of blastocoel

51. The tendency of population to remain in genetic equilibrium may be disturbed by :

(1) Lack of migration

(2) Lack of mutations

(3) Lack of random mating

(4) Random mating

52. The two antibiotic resistance genes on vector pBR322 are for :

(1) Tetracycline and Kanamycin

(2) Ampicillin and Tetracycline

(3) Ampicillin and Chloramphenicol

(4) Chloramphenicol and Tetracycline

53. Which one of the following equipments is essentially required for growing microbes on a large scale, for industrial production of enzymes ?

(1) BOD incubator

(2) Sludge digester

(3) Industrial oven

(4) Bioreactor

54. DNA precipitation out of a mixture of biomolecules can be achieved by treatment with :

(1) Isopropanol

(2) Chilled ethanol

(3) Methanol at room temperature

(4) Chilled chloroform

55. Following statements describe the characteristics of the enzyme Restriction Endonuclease. Identify the incorrect statement.

(1) The enzyme cuts DNA molecule at identified position within the DNA.

(2) The enzyme binds DNA at specific sites and cuts only one of the two strands.

(3) The enzyme cuts the sugar-phosphate backbone at specific sites on each strand.

(4) The enzyme recognizes a specific palindromic nucleotide sequence in the DNA.

56. The correct order of steps in Polymerase Chain Reaction (PCR) is :

(1) Extension, Denaturation, Annealing

(2) Annealing, Extension, Denaturation

(3) Denaturation, Annealing, Extension

(4) Denaturation, Extension, Annealing

57. Enzyme used in ELISA test is :

(1) Endonuclease

(2) Ligase

(3) Peroxidase

(4) Polymerase

58. What will be the pCO_2 and pO_2 in atmospheric air as compared to alveoli respectively ?

(1) Low and high

(2) High and low

(3) High and high

(4) Low and low

59. In ureotelic animals, urea is formed by :

(1) Kreb's cycle

(2) EM pathway

(3) Ornithine cycle

(4) Cori's cycle

60. Which one of the following mammalian cells is not capable of metabolising glucose to carbon-dioxide aerobically ?

(1) Red blood cells

(2) White blood cells

(3) Unstriated muscle cells

(4) Liver cells

61. Which one of the following is a protein deficiency disease ?

(1) Kwashiorkor

(2) Night blindness

(3) Eczema

(4) Cirrhosis

62. Which of the following statement is incorrect wrt inbreeding ?

(1) Inbreeding increases homozygosity

(2) Inbreeding exposes harmful recessive gene that are eliminated by selection

(3) Inbreeding helps in accumulation of deleterious alleles and elimination of desirable alleles

(4) Inbreeding helps in developing a pure-line animal

63. What is correct to say about the hormone action in humans ?

(1) In females, FSH first binds with specific receptors on ovarian cell membrane

(2) FSH stimulates the secretion of estrogen and progesterone

(3) Glucagon is secreted by B-cells of Islets of langerhans and stimulates glycogenolysis

(4) Secretion of thymosins is stimulated with aging

64. Body having meshwork of cells, internal cavities lined with food filtering flagellated cells and indirect development are the characteristics of phylum :

(1) Protozoa

(2) Coelenterata

(3) Porifera

(4) Mollusca

65. Which of the following characteristics is mainly responsible for diversification of insects on land ?

(1) Eyes

(2) Segmentation

(3) Bilateral symmetry

(4) Exoskeleton

66. Which of the following endoparasites of humans does show viviparity ?

(1) Ascaris lumbricoides

(2) Ancylostoma duodenale

(3) Enterobius vermicularis

(4) Trichinella spiralis

67. Select the Taxon mentioned which represents both marine and fresh water species.

(1) Echinoderms

(2) Ctenophora

(3) Cephalochordata

(4) Cnidaria

68. Which one of the following living organisms completely lacks a cell wall ?

(1) Cyanobacteria

(2) Sea-fan(Gorgonia)

(3) Saccharomyces

(4) Blue-green algae

69. Biological organisation starts with :

(1) Cellular level

(2) Organismic level

(3) Atomic level

(4) Submicroscopic molecular level

70. Peripatus is a connecting link between :

(1) Coelenterata and Porifera

(2) Ctenophora and Platyhelminthis

(3) Mollusca and Echinodermata

(4) Annelida and Arthropoda

71. The C 4 plants are photosynthetically more efficient than C 3 plants because :

(1) They have more chloroplasts

(2) The CO_2 compensation point is more

(3) CO_2 generated during photorespiration is trapped and recycled through PEP carboxylase

(4) The CO_2 efflux is not prevented

72. The frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes was explained by :

(1) T.H. Morgan

(2) Gregor J. Mendel

(3) Alfred Sturtevant

(4) Sutton Boveri

73. What is the genetic disorder in which an individual has an overall masculine development gynaecomastia, and is sterile ?

(1) Turner's syndrome

(2) Klinefelter's syndrome

(3) Edward syndrome

(4) Down's syndrome

74. A woman has an X-linked condition on one of her X chromosomes. This chromosome can be inherited by :

(1) Only daughters
(2) Only sons
(3) Both sons and daughters
(4) Only grandchildren

75. Which one of the following discoveries resulted in a Nobel Prize ?

(1) X-rays induce sex-linked recessive lethal mutations
(2) Cytoplasmic inheritance
(3) Recombination of linked genes
(4) Genetic engineering

76. Normally DNA molecule has A-T, G-C pairing. However, these bases can exist in alternative valency status owing to rearrangements called :

(1) Frame-shift mutation
(2) Tautomerisational mutation
(3) Analog substitution
(4) Point mutation

77. The most striking example of point mutation is found in a disease called :

(1) Down's syndrome
(2) Sickle cell anaemia
(3) Edward syndrome
(4) Night blindness

78. When two genetic loci produce identical phenotypes in cis and trans position, they are considered to be :

(1) Multiple alleles
(2) The parts of same gene
(3) Pseudoalleles
(4) Different genes

79. What map unit (Centimorgan) is adopted in the construction of genetic maps ?

(1) A unit of distance between two expressed genes representing 10% cross over
(2) A unit of distance between two expressed genes representing 100% cross over
(3) A unit of distance between genes an chromosomes, representing 1 % cross over
(4) A unit of distance between genes on chromosomes, representing 50% cross over

80. Expressed Sequence Tags (ESTS) refers to :

(1) Genes expressed as RNA
(2) Polypeptide expression
(3) DNA polymorphism
(4) Novel DNA sequences

81. Select one of the following of important features distinguishing Gnetum from Cycas and Pinus and showing affinities with angiosperms :

(1) Embryo development and apical meristem
(2) Absence of resin duct and leaf venation
(3) Presence of vessel elements and absence of archegonia
(4) Perianth and two integuments

82. Which one of the following is heterosporous ?

(1) Equisetum
(2) Dryopteris
(3) Salvinia
(4) Adiantum

83. A system of classification, in which a large number of traits are considered, is :

(1) Natural system
(2) Phylogenetic system
(3) Artificial system
(4) Synthetic system

84. The book 'Genera plantarum' was written by :

(1) Engler & Prantl
(2) Bentham & Hooker
(3) Bessey
(4) Hutchinson

85. Phylogenetic classification is one which is based on :

(1) Overall similarities
(2) Utilitarian system
(3) Habits of plants
(4) Common evolutionary descent

86. Endosperm of gymnosperm is ontogenetically similar to angiospermic :

(1) Endosperm
(2) Embryo sac
(3) Archegonium
(4) Megasporangia

87. Flowering plants are more successful than other members of the plant world because :

(1) They are large and have a good vascular tissue system
(2) They carry out variety of pollination mechanism
(3) The protected plant embryo can survive in the period of unfavourable conditions
(4) All of these

88. A. Heterospory is found in all members of pteropsida :

B. Selaginella is advance among pteridophytes as it produces seeds

C. Pinus leaves are monomorphic, pinnate compound and have sunken stomata as adaptation against transpiration

D. Sporic meiosis is characteristic of life cycle in many organisms like Volvox, Chlamydomonas and Ulothrix.

(1) All are incorrect
(2) Both B and C are correct
(3) Only B is correct
(4) Only D is incorrect

89. Which phytohormone is synthesised in ripened fruits ?

(1) ABA
(2) Auxin
(3) Cytokinin
(4) Ethylene

90. Which of the following is incorrect about ethylene ?

(1) Promotes root hair formation
(2) It is natural and derivative of carotenoids
(3) It increases the number of female flowers
(4) It causes synchronisation of flowering and fruit set in pineapples

91. All the following may be methods for the inhibition of microbial growth by antibiotics except :

(1) Antibiotics disrupt cell wall synthesis.

(2) Antibiotics interfere with cell membrane function.

(3) Antibiotics prevent the release of energy from ATP.

(4) Antibiotics inhibit the synthesis of protein.

92. In which of the following would you place the plants having vascular tissue lacking seeds ?

(1) Pteridophytes

(2) Gymnosperms

(3) Bryophytes

(4) Algae

93. Apomixis is a type of reproduction in plants in which ?

(1) Fertilization does not take place.

(2) Male nucleus takes part in fertilization.

(3) Embryo formation does not take place.

(4) Generative nucleus takes part in fertilization.

94. From which of the following algae, agar is commercially extracted ?

(A) Gracillaria

(B) Fucus

(C) Sargassum

(D) Gelidium

(E) Turbinaria

(1) C and E

(2) B and C

(3) D and E

(4) A and D

95. In which one of the following pairs of diseases is viral as well as transmitted by mosquitoes ?

(1) Elephantiasis and dengue

(2) Yellow fever and sleeping sickness

(3) Encephalitis and sleeping sickness

(4) Yellow fever and dengue

96. A free living nitrogen-fixing cyanobacterium which can also form symbiotic association with the water fern Azolla is :

(1) Tolypothrix
(2) Nostoc
(3) Chlorella
(4) Anabaena

97. Ionophores are :

(1) the gating mechanisms associated with the transport of ions.
(2) intrinsic proteins that passively transport ions.
(3) chemicals that form pores in the plasma membrane and allow ions to cros.
(4) intrinsic proteins that actively transport ions.

98. The trans Golgi network is :

(1) the intermediate compartment between the ER and the Golgi.
(2) the part of the Golgi where fusion of vesicles from the ER occurs.
(3) where sorting of proteins to the lysosomes, plasma membrane and cell exterior occurs.
(4) the network of vesicles that transport proteins between Golgi cisternae.

99. Most human cells are diploid with total DNA content of 2C. The DNA content increases to 4C before the onset of mitosis. At anaphase, the DNA content of each cluster will be :

(1) 4C
(2) 2C
(3) 1C
(4) 3C

100. Malignant cancer cells have all of the following properties except :

(1) unregulated cell division
(2) inhibition of angiogenesis
(3) resistance to apoptosis
(4) cellular immortality

Entrance Exam 2021 Answer Key held on dated 21/09/2021 at 10:00 am

Subjects of Life Sciences

Question No.	A	B	C	D
1	3	1	1	4
2	1	2	3	2
3	1	2	2	4
4	4	4	3	4
5	4	1	1	1
6	4	1	2	4
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46	2	4	3	2
47	2	4	3	1
48	3	1	1	1
49	3	2	3	3
50	1	1	1	4

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Entrance Exam 2021 Answer Key held on dated 21/09/2021 at 10:00 am			Subjects of Life Sciences	
Question No.	A	B	C	D
51	1	3	1	3
52	3	3	4	2
53	2	1	2	4
54	4	2	2	2
55	4	4	3	2
56	1	2	4	3
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71	4	3	1	1
72	2	2	3	3
73	4	4	1	2
74	4	2	3	3
75	1	2	4	1
76	4	3	4	2
77	3	3	4	2
78	1	1	2	3
79	1	3	4	3
80	3	1	4	1
81	1	3	1	3
82	3	1	2	3
83	1	1	2	1
84	3	4	4	2
85	4	4	1	4
86	4	4	1	2
87	4	3	3	4
88	2	3	1	1
89	4	2	4	4
90	4	2	3	2
91	3	1	1	3
92	1	3	3	1
93	3	1	2	1
94	4	3	4	4
95	1	4	4	4
96	2	4	1	4
97	1	4	1	3
98	1	2	4	3
99	3	4	4	2
100	4	4	1	2

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