

# AMC

## ADMISSION TEST

ARMY MEDICAL COLLEGE

**SOLVED PAPERS GUIDE**

### SALIENT FEATURES:

- 3 Solved Papers for Each Subject
- Personality Tests

# **BIOLOGY**

# **PRACTICE SOLVED PAPERS**

1. Which of the following has the highest temperature?
  - a. Cool grassland
  - b. Cool desert
  - c. Temperate rainforest
  - d. Tropical rainforest
2. The increase in temperature of reaction over the optimum temperature results in which of the following?
  - a. Active site is blocked.
  - b. Enzyme is denatured.
  - c. Enzyme activity is increased.
  - d. None of the above.
3. Which of the following is not a part of axial skeleton?
  - a. Pectoral girdle
  - b. Skull
  - c. Sternum
  - d. Vertebrae
4. In cockroach, the blood passes from haemocoel in head to
  - a. Perineural sinus
  - b. Pericardial sinus
  - c. All of the above
  - d. Perivisceral sinus
5. The excretory system of Platyhelminthes or flatworms has specialized cells called
  - a. Flame cells
  - b. Nephrostome
  - c. None of the above
  - d. Malpighian cells
6. Protenor bug shows which of the following patterns of sex determination?
  - a. XO-XX
  - b. XY-XX
  - c. ZZ-ZW
  - d. None of the above
7. One gene-one polypeptide is a modified form of \_\_\_\_\_ hypothesis.
  - a. One gene-one histone
  - b. One gene-one amino acid
  - c. One gene-one enzyme
  - d. One gene-one polymerase
8. The body of which of the following phyla is covered by mantle?
  - a. Phylum Mollusca
  - b. Phylum Nematoda
  - c. Phylum Annelida
  - d. Phylum Arthropoda
9. The leaflike structures of kelps are termed as
  - a. Blades
  - b. Stipes
  - c. Holdfast
  - d. none of the above
10. Tetanus is caused by
  - a. Low calcium level
  - b. Aerobic bacterium
  - c. Anaerobic bacterium
  - d. Virus
11. Two heavy chain of an antibody are linked by \_\_\_\_\_
  - a. Peptide bonds
  - b. Glycosidic linkage
  - c. Disulfide bridges
  - d. Hydrogen bonds
12. Which of the following is incorrect about deuterostomes?
  - a. Mesoderm is derived from archenteron
  - b. Blastopore forms anus during development
  - c. Division is determinate.
  - d. Cleavage is radial.
13. Study of \_\_\_\_\_ protein proposed that proteins are made up of amino acids.
  - a. Hemoglobin
  - b. Histone
  - c. Collagen
  - d. Insulin
14. At low temperature, the fluidity of cell membrane is altered because of
  - a. Proteins
  - b. Lipids
  - c. Carbohydrates
  - d. Cholesterol
15. Descent with modification means
  - a. Diversity in life
  - b. Unity in life
  - c. Adaptation to their local environment
  - d. Adaptation is genetic
16. The type of reasoning that moves from general to specific is called
  - a. Specific reasoning
  - b. Deductive reasoning
  - c. Inductive reasoning
  - d. None of the above



17. Which of the following gives rise to digestive system?
- Grey vegetal cytoplasm of blastomere
  - Grey equatorial cytoplasm of blastomere
  - Grey vegetal cytoplasm of primitive streak
  - cells
  - Grey equatorial cytoplasm of primitive streak

18. In prokaryotes, transfer RNA is synthesized by

- RNA polymerase I
- RNA polymerase II
- RNA polymerase III
- RNA polymerase

19. The nuclear material or DNA in bacterial cells occupies a position near to the center of the cell called

- Nucleoid
- Chromatin body
- Nuclear region
- All of the above

20. Which of the following is biologically not a fish?

- Cray fish
- Jelly fish
- Silver fish
- All of the above

21. Which of the following neurotransmitter is present in peripheral nervous system?

- Adrenaline
- Acetyl choline
- Nor epinephrine
- Serotonin

22. The interlocking plates of shells of dinoflagellates are made up of

- Pectin
- Cellulose
- Silicates
- Lignin

23. Common name for Anthoceropsida is

- Liverworts
- Hornworts
- Whisk ferns
- Mosses

24. Which of the following is not present in zone of elongation?

- Volume increases
- Plasticity increases
- Pressure increases
- Cytoplasm synthesis

25. Which of the following explains Darwin's theory?

- Descent with modification
- Natural selection
- Adaptation
- All of the above

26. \_\_\_\_\_ is the ultimate source of all changes.

- Non-random mating
- Mutation
- Genetic drift
- Selection

27. Which of the following plant has become extinct?

- Horneophyton
- Anthoceros
- Polytrichum
- Porella

28. Which of the following processes does not occur in mitochondrial matrix?

- Aerobic respiration
- Glycolysis
- Kreb's cycle
- Fatty acid metabolism

29. The number of petals in monocots is

- 3 or multiples of 3
- 5 or multiples of 5
- 4 or multiples of 4
- None of the above

30. In synecology we study

- Origin of community
- Structure of community
- Composition of community
- All of the above

31. Deficiency of ATP causes

- Twitches
- Convulsions
- Spasm
- Contractures

32. Photoperiodism stimulates flowering in

- Long day plants
- Short day plants
- Day neutral plants
- Both A and B



33. Mitochondria move about freely in cytoplasm because
- They are ionic in nature.
  - They are small in size.
  - Cytoplasmic streaming movements occur.
  - All of the above.
34. The order of transfer of energy is
- Carotenoids — Chlorophyll b — Chlorophyll a
  - Chlorophyll b — Carotenoids — Chlorophyll a
  - Chlorophyll a — Chlorophyll b — Carotenoids
  - Carotenoids — Chlorophyll a — Chlorophyll b
35. Which of the following is correct about coccyx?
- Formed by the fusion of five anterior vertebrae.
  - Formed by the fusion of five posterior vertebrae.
  - Formed by the fusion of four anterior vertebrae.
  - Formed by the fusion of four posterior vertebrae.
36. Which of the following wavelengths is least absorbed by chlorophylls?
- Green
  - indigo
  - Yellow
  - All of the above
37. Antibodies are synthesized in
- Spleen
  - Lymph nodes
  - Kidney
  - Liver
38. Diaphragm is a sheet of
- Skeletal muscles
  - Cardiac muscles
  - Smooth muscles
  - All of the above
39. In mammals, \_\_\_\_\_ has been adapted as organ of thermoregulation.
- Thyroid gland
  - Skin
  - Muscles
  - Blood capillaries
40. Gas molecules, water, glucose can easily cross the plasma membrane because
- They are small molecules.
  - They are neutral.
  - They are lipid soluble.
  - Both A and B
41. The process of pasteurization developed by Louis Pasteur is used to preserve
- Meat
  - Fruits and Vegetables
  - Milk and Milk products
  - All of the above
42. In Marchantia, a typical liverwort, the gemma cups function in
- Water absorption
  - Sexual reproduction
  - Asexual reproduction
  - Absorption of carbon dioxide
43. Which of the following pathway is of prime importance for both water and solutes?
- Apoplast pathway
  - Symplast pathway
  - Vacuolar pathway
  - All of the above
44. Theory of evolution was published by
- Linnaeus
  - Lamarck
  - Darwin
  - Mendel
45. What is the function of restriction endonucleases in bacteria?
- Cut down normal DNA
  - Restrict growth of viruses
  - Produce sticky ends in bacterial
  - All of these
46. Aquatic arthropods respire through
- Gills
  - Book lungs
  - Skin
  - Both A and B
47. In a polluted lake, \_\_\_\_\_ the community.
- Protozoa
  - Cyanobacteria
  - Crustaceans
  - Insect larvae

48. The common name for Actinia is
- Jelly fish
  - Planaria
  - Leech
  - Sea anemone
49. Age of trilobites lies in which of the following era?
- Proterozoic era
  - Mesozoic era
  - Cenozoic era
  - Palaeozoic era
50. Glyoxysomes are sites for the breakdown of
- Fatty acids to succinate
  - Hydrogen peroxide to oxidases and catalases
  - Succinate to fatty acids
  - Both a & b
51. Translation occurs in
- Cytoplasm
  - Mitochondria
  - Nucleus
  - SER
52. Dorsal root ganglion contains
- Cell bodies of sensory neurons
  - Cell bodies of motor neurons
  - Nerve fibers of sensory neurons
  - Nerve fibers of motor neurons
53. Amino acids are reabsorbed from glomerular filtrate through
- Proximal tubule
  - Descending limb of Loop of Henle
  - Vasa recta
  - Distal tubule
54. In a transfer RNA amino acid attaches to \_\_\_\_\_ side.
- Anti-codon
  - 3' end of transfer RNA
  - 5' end of transfer RNA
  - Enzyme recognition site
55. After the absorption of carbon dioxide from tissues, the blood contains about \_\_\_\_\_ ml of blood.
- 4
  - 54
  - 46
  - 50
56. Spindle fibers are synthesized in which phase?
- G<sub>0</sub>
  - G<sub>1</sub>
  - G<sub>2</sub>
  - S
57. A person with AB blood group has
- Antigen A and antigen B on RBCs
  - Anti-A and anti-B bodies in the serum
  - Its genotype is IAi
  - Both A and B
58. Fibrous proteins differ from the globular proteins because they
- Are insoluble in water
  - Can be crystallized
  - Are non-elastic
  - All of the above
59. A QRS complex in an ECG (electrocardiogram) occurs just before \_\_\_\_\_
- Atrial contraction
  - Ventricular contraction
  - Ventricles recovering from contractions
  - None of the above
60. To produce lactose, glucose and galactose undergo which of the following reactions?
- Dehydrohalogenation
  - Hydrogenation
  - Hydrolysis
  - Dehydration
61. Which of the following food chains best support a community?
- Food chain with 2-3 links
  - Food chain with 4-5 links
  - Food chain with 6-7 links
  - Food chain with 8-9 links
62. Secretin inhibits the secretion of
- Pancreatic secretions
  - Gastric secretions
  - Hepatic secretions
  - Both A and B
63. Which of the following is homeotherm?
- Fish
  - Amphibians
  - Reptiles
  - Birds

64. The three principle modes of nutrition exclude which of the following?
- Photosynthesis
  - Absorption
  - Decomposition
  - Ingestion
65. Brain damage is caused by
- SO<sub>2</sub>
  - NO<sub>2</sub>
  - Lead compounds
  - CFC's
66. The optimum temperature for trypsin enzyme is
- 35.1
  - 37.0
  - 32.6
  - 38.3
67. Glycylalanine is a
- Nucleic acid
  - Lipid
  - Carbohydrate
  - Protein
68. What is the ratio between the size of annulus and stomium?
- 1:2
  - 2:1
  - 1:3
  - 3:1
69. The surface pesticides are removed by
- Washing
  - Peeling
  - Bolling
  - Frying
70. Which of the following is not the function of blue rays?
- Causes cell elongation
  - Enhances cell division
  - Retards cell enlargement
  - All of the above
71. Fertilization of ovum takes place in
- Ovary
  - Fallopian tube
  - Uterus
  - Cervix
72. At present, about 2,500,000 species of organisms are known to science. Of these organisms, percentage of vascular plants is about
- 17.6%
  - 9.4%
  - 53.1%
  - 19.9%
73. ABO locus is present on chromosome
- 6
  - 9
  - 12
  - 16
74. Which of the following acts as the inhibitor for the enzyme succinic dehydrogenase?
- Malonic acid
  - Fumaric acid
  - None of the above
  - Succinic acid
75. Manipulation of food and holding the food between the teeth is the function of which of the following?
- Tongue
  - Cheek
  - Lips
  - All of the above
76. Paramyxovirus causes which of the following diseases?
- Herpes simplex
  - Influenza
  - Mumps
  - Small pox
77. The hyphae which are not divided into individual cells by septum are
- Multinucleated hyphae
  - Non-septate hyphae
  - Coenocytic hyphae
  - All of the above
78. DNA stores biological information in \_\_\_\_\_ order.
- Linear
  - Helical
  - Globular
  - None of the above



79. Which of the following is the largest ecosystem on Earth?
- Tropical rain forest
  - Desert ecosystem
  - Ocean ecosystem
  - Grassland
80. ATP provides chemical energy for the synthesis of sugar by reducing
- H<sub>2</sub>O
  - CO<sub>2</sub>
  - Chlorophyll
  - O<sub>2</sub>
81. Separation of homologous chromosomes starts during
- Leptotene
  - Zygotene
  - Pachytene
  - Diplotene
82. Which of the following is a rich source of auxins during fertilization in plants?
- Ovary
  - Pollen grain
  - Style
  - Ovule
83. The speed of water carried upward by xylem tissue in tall trees is
- 8 ft/h
  - 8 m/min
  - 8 ft/min
  - 8 m/h
84. The disadvantage of cloning is/are
- Rapid aging
  - Resistance to environmental stress
  - Resistance to diseases
  - All of these
85. Hepatitis is caused by which of the following viruses?
- HIV
  - None of the above
  - H. virus
  - Hepatitis virus
86. Hindukush is \_\_\_\_\_ type of terrestrial ecosystem.
- Coniferous forest
  - Tundra ecosystem
  - Temperate forest
  - Grassland ecosystem
87. Deserts are found in every continent around \_\_\_\_\_.
- 0-10 north and south latitude
  - 20-30 north and south latitude
  - 0-10 north and south longitude
  - 20-30 north and south longitude
88. The most complex exoskeleton is found in
- Molluscs
  - Marine Bivalvia
  - Arthropods
  - Snakes
89. Which of the following is false?
- Plasmid DNA and viral DNA both serve as vectors.
  - Only cloned bacteria or organisms are referred as a clone not genes/molecules.
  - Recombinant DNA is formed when DNA ligase joins the sticky ends.
  - Both cloned gene and protein can be isolated after cloning.
90. Which of the following enzyme acts only on lagging strand?
- Helicase
  - Primase
  - DNA polymerase III
  - DNA ligase
91. Birds and mammals evolved from
- Reptiles
  - Fish
  - Amphibians
  - Archaeopteryx
92. \_\_\_\_\_ is the form of nitrogen that can be utilized by plants.
- Nitrate
  - Ammonium
  - Nitrite
  - Both A & B
93. The major cell infected by HIV is
- B-lymphocyte
  - All of the above
  - T-lymphocyte
  - Leukocytes
94. The major unit of ecology is
- Community
  - Biosphere
  - Ecosystem
  - Food web

95. When equal intensities are given, there is more photosynthesis in
- Yellow
  - Green
  - Blue
  - Red
96. The detection of vibration in monkeys is achieved by
- Receptors in cerebellum
  - Receptors in cochlea in ear
  - Receptors in skin
  - Receptors in joints
97. Which of the following is the goal of gerontology?
- To increase life span
  - To decrease signs of old age
  - To increase health span
  - All of these
98. Synaptonemal complex forms in \_\_\_\_\_ phase.
- Leptotene
  - Zygotene
  - Pachytene
  - Diplotene
99. Function of CSF (cerebrospinal fluid) is
- Providing nutrition
  - Shock absorbance
  - Waste removal
  - All of the above
100. Percentage of NaCl in blood?
- 0.3
  - 0.6
  - 0.9
  - 0.12

# ANSWERS & EXPLANATIONS

Question Number	1.	Correct Option	d
<b>Explanation</b> Tropical rainforest has the highest temperature among all of them. The temperature of desert is high but during day time, but during night it gets cold.			

Question Number	2.	Correct Option	b
<b>Explanation</b> If the temperature of the reaction is increased over the optimum temperature, the globular structure of enzyme is lost, and enzyme becomes denatured.			

Question Number	3.	Correct Option	a
<b>Explanation</b> Both the pectoral and pelvic girdles are the part of appendicular skeleton. However, skull, sternum and vertebrae are parts of axial skeleton.			

Question Number	4.	Correct Option	d
<b>Explanation</b> In cockroach, the blood flows from heart to aorta, to haemocoel, to perivisceral sinus, to perineural sinus, to perivisceral sinus, to pericardial sinus, and to heart through ostia.			

Question Number	5.	Correct Option	a
<b>Explanation</b> The excretory system of flatworms consists of branching tubes ending in bulb-like cells, the flame cells.			

Question Number	6.	Correct Option	a
<b>Explanation</b> XO-XX pattern of sex determination is found in grasshopper and protenor bug. In this pattern, heterogametic XO is male and homogametic XX is female.			

Question Number	7.	Correct Option	c
<b>Explanation</b> Beadle and Tatum examined various mutant strains; each of the mutant had a defect in a single enzyme, caused by a mutation at a single site on one chromosome. Hence, they concluded with this hypothesis.			

Question Number	8.	Correct Option	a
<b>Explanation</b> In molluscs, the body is covered by a glandular epithelial envelope called mantle which secretes calcareous shell.			

Question Number	9.	Correct Option	a
<b>Explanation</b> The leaflike structures of kelps are blades, stemlike are stipes and rootlike are holdfast.			

Question Number	10.	Correct Option	c
<b>Explanation</b> Tetanus is an acute infectious disease caused by an anaerobic bacterium <i>Clostridium tetani</i> resulting in persistent painful spasms of skeletal muscles.			

Question Number	11.	Correct Option	c
<b>Explanation</b> There are 2 disulfide bonds between constant portion of 2 heavy chains of antibodies.			

Question Number	12.	Correct Option	c
<b>Explanation</b> The cleavage or division of the zygote is radial and indeterminate.			



Question Number	13.	Correct Option	d
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**Explanation**

Frederick Sanger described the complete amino acid sequence of insulin. Sanger's achievement was significant to demonstrate that proteins consisted of amino acids.

Question Number	14.	Correct Option	b
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**Explanation**

Only lipids maintain the fluidity of cell membrane, hence at low temperature, the fluidity of cell membrane is altered because lipids of the membrane become locked into crystalline structures. This affects the transport of the solutes

Question Number	15.	Correct Option	b
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**Explanation**

Descent with modification means unity in life, with all organisms related through descent from some common ancestor that lived in the remote past.

Question Number	16.	Correct Option	b
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**Explanation**

Deductive reasoning moves from general to specific. It involves drawing specific conclusions from some general assumptions.

Question Number	17.	Correct Option	a
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**Explanation**

Grey vegetal cytoplasm of blastomere develops into the gut (digestive system).

Question Number	18.	Correct Option	d
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**Explanation**

In prokaryotes, there are no types of RNA polymerase. The three different types of RNA polymerase are present only in eukaryotes.

Question Number	19.	Correct Option	d
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**Explanation**

Chromatin body and nuclear region are the other nucleoid.

Question Number	20.	Correct Option	
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**Explanation**

All of the above do not fit in the biologists' definition of

Question Number	21.	Correct Option	
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**Explanation**

Acetyl choline is the main transmitter for synapses in the peripheral nervous system. Others are mostly involved in transmission within the brain and spinal cord.

Question Number	22.	Correct Option	
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**Explanation**

The cells of dinoflagellates are covered with shells of cellulose plates impregnated with silicates.

Question Number	23.	Correct Option	b
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**Explanation**

The common name of Anthoceropsida is hornworts, Hepaticopsida is liverworts, Musci is mosses and Psilopsida is whisk ferns.

Question Number	24.	Correct Option	c
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**Explanation**

During the zone of elongation, volume increases, plasticity increases, cytoplasm is synthesized but pressure decreases during the zone of elongation.

Question Number	25.	Correct Option	d
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**Explanation**

In the origin of species published by Darwin, he developed the main points including descent with modification and natural selection and adaptation.

Question Number	26.	Correct Option	b
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**Explanation**  
Although mutation occurs rarely, it is the ultimate source of all changes.

Question Number	27.	Correct Option	a
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**Explanation**  
Hemichordata is the representative of the group Cephalopoda and has become extinct.

Question Number	28.	Correct Option	b
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**Explanation**  
Krebs's cycle, aerobic respiration and fatty acid metabolism occurs in the mitochondrial matrix. However, glycolysis occurs in cytoplasm.

Question Number	29.	Correct Option	a
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**Explanation**  
The number of petals in monocots is 3 petals or multiples of 3.

Question Number	30.	Correct Option	d
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**Explanation**  
Synecology is the study of various aspects of community like the origin, structure and composition of community.

Question Number	31.	Correct Option	d
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**Explanation**  
Muscle fatigue results from relative deficit of ATP. When no ATP is available, contractures or states of continuous contraction result because the cross bridges are unable to detach.

Question Number	32.	Correct Option	a
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<b>Explanation</b>
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Photoperiodism stimulates flowering in long day plants and inhibits flowering in short day plants.

Question Number	33.	Correct Option	c
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**Explanation**  
The free-floating cell organelles e.g. mitochondria move about in cytoplasm due to cytoplasmic streaming movements.

Question Number	34.	Correct Option	a
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**Explanation**  
It is generally believed that the correct order of reaction is  
 $Carotenoids \rightarrow Chlorophyll\ b \rightarrow Chlorophyll\ a$

Question Number	35.	Correct Option	d
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**Explanation**  
Sacrum is formed by the fusion of five anterior vertebrae while coccyx is formed when the four posterior vertebrae fuse with each other.

Question Number	36.	Correct Option	d
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**Explanation**  
The wavelengths least absorbed by plants include all green, yellow and indigo. These wavelengths are reflected from the surface of the leaf.

Question Number	37.	Correct Option	d
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**Explanation**  
Plasma proteins are synthesized in liver.

Question Number	38.	Correct Option	a
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**Explanation**  
The floor of the chest is called diaphragm which is a sheet of skeletal muscles.

Question Number	39	Correct Option	b
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#### **Explanation**

Sweat glands, piloerection and pilorelaxation and blood vessel dilation are the steps taken for thermoregulation, all of these occur in skin that makes skin an adapted organ for thermoregulation.

Question Number	40	Correct Option	d
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#### **Explanation**

Many small gas molecules, water, glucose etc. being the neutral particles can easily cross the plasma membrane. They are not lipid soluble in nature.

Question Number	41	Correct Option	c
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#### **Explanation**

Hydroponic culture technique is used to test whether a certain nutrient is essential for plant or not. In this technique, plants are grown in aerated water to which nutrient mineral salts have been added.

Question Number	42	Correct Option	c
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#### **Explanation**

The gemma cups present in a liverwort *Marchantia* function in asexual reproduction.

Question Number	43	Correct Option	a
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#### **Explanation**

Apoplast pathway is of greatest importance for both water and solute transport. The symplast pathway is less important and movement through vacuolar pathway is negligible.

Question Number	44	Correct Option	b
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#### **Explanation**

Lamarck (1744-1829) published his theory of evolution.

Question Number	45	Correct Option	b
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#### **Explanation**

Restriction enzyme cuts viral DNA but does not harm bacterial chromosomes, hence it restricts the growth of viruses but has no effect on the bacterial DNA.

Question Number	46	Correct Option	d
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#### **Explanation**

The aquatic arthropods respire through gills and book lungs.

Question Number	47	Correct Option	b
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#### **Explanation**

Producers like cyanobacteria (blue-green algae) form a scum on the lake surface, they dominate the community and as a result the plant and animal community die.

Question Number	48	Correct Option	d
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#### **Explanation**

The common name for *Actinia* is sea anemone. It belongs to the phylum Cnidaria.

Question Number	49	Correct Option	d
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#### **Explanation**

Age of trilobites was present about 400 M years ago in the Palaeozoic era. The trilobites evolved to give the modern-day invertebrates.

Question Number	50	Correct Option	a
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#### **Explanation**

In seeds rich in lipids, glyoxysomes are sites for the breakdown of fatty acids to succinate.

Question Number	51	Correct Option	a
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#### **Explanation**

Cytoplasm is the site for translation and nucleus is the site for transcription to occur.

Question Number	52	Correct Option	a
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#### **Explanation**

Dorsal root ganglion is a cluster of neurons in a dorsal root of spinal nerve. It contains cell bodies of sensory neurons.



53. Correct Option a

tion  
option of glucose, amino acids and salts occurs only in  
tubule of the functional unit of kidney, nephron.

54. Correct Option b

tion  
RNA molecules transport the amino acids to ribosomes  
ing polypeptides. Amino acid attaches at 3' hydroxyl OH  
transfer RNA.

55. Correct Option b

tion  
nal blood has 50 ml of carbon dioxide, after it passes from  
es, it consists of 54 ml of blood.

56. Correct Option c

tion  
hase, energy storage for chromosome movements,  
is of mitosis specific proteins, RNA and spindle fibers takes

57. Correct Option a

tion  
n with AB blood type has both the antigen A and antigen B  
s, but there are no anti-A and anti-B antibodies in the  
s blood.

58. Correct Option a

tion  
proteins are insoluble in water. They are non-crystalline  
stic in nature. However, globular proteins are soluble in  
they are crystalline and non-elastic in nature.

Question Number 59 Correct Option b

#### Explanation

The QRS complex in an electrocardiogram occurs just before ventricular contraction

Question Number 60 Correct Option d

#### Explanation

When glucose and galactose react, a water molecule is released and a glycosidic bond is formed between them. This type of reaction falls under the category of dehydration reactions

Question Number 61 Correct Option a

#### Explanation

A shorter food chain of two or three links supports a community more efficiently than a long chain of five links where much of the original energy from the producers would reach those organisms at higher trophic levels.

Question Number 62 Correct Option b

#### Explanation

Hepatic and pancreatic secretions are stimulated by secretin. However, secretin inhibits gastric secretions.

Question Number 63 Correct Option d

#### Explanation

Homeotherms are animals that maintain their body temperature regardless of any change in the surrounding temperature. Birds and mammals can maintain their body temperature; hence they are termed as homeotherms.

Question Number 64 Correct Option c

#### Explanation

The three principle modes of nutrition are photosynthesis, absorption and ingestion

Question Number	65.	Correct Option	c
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**Explanation**

Lead compounds and Carbon monoxide present in air as pollutants result in brain damage.

Question Number	66.	Correct Option	b
-----------------	-----	----------------	---

**Explanation**

The optimum temperature for all body enzymes is 37.0-degree Celsius.

Question Number	67.	Correct Option	
-----------------	-----	----------------	--

**Explanation**

Glycylalanine is a protein that is formed when a peptide bond is formed between two amino acids. It is a dipeptide.

Question Number	68.	Correct Option	
-----------------	-----	----------------	--

**Explanation**

The annulus occupies three fourth of the edge of capsule and remaining one fourth is the stomium.

Question Number	69.	Correct Option	b
-----------------	-----	----------------	---

**Explanation**

Pesticides are inevitably poisonous to kill pests and are suspected for causing cancer and other disorders, so they should be removed before eating. Peeling apples and potatoes removes most of the surface pesticides.

Question Number	70.	Correct Option	a
-----------------	-----	----------------	---

**Explanation**

Light plays an important role in the growth of plants. Red light favors elongation of cells and blue light enhances cell division but retards cell enlargement.

Question Number	71.	Correct Option	b
-----------------	-----	----------------	---

**Explanation**

The fertilization of the ovum takes place in proximal part of fallopian tube/ oviduct.

Question Number	72.	Correct Option	a
-----------------	-----	----------------	---

**Explanation**

Of all these organisms currently known to science, 53.1% are insects, 19.9% are animals other than insects, 17.8% are various plants and 9.4% are fungi, algae, protozoa, and various prokaryotes.

Question Number	73.	Correct Option	b
-----------------	-----	----------------	---

**Explanation**

The ABO blood group system is encoded by a single polymorphic gene I present on chromosome 9. It has three multiple alleles I<sup>A</sup>, I<sup>B</sup>, and i.

Question Number	74.	Correct Option	a
-----------------	-----	----------------	---

**Explanation**

Malonic acid has a similar structure as succinic acid. Hence, it acts as a competitive inhibitor for the enzyme succinic dehydrogenase and blocks the active site as no product is formed.

Question Number	75.	Correct Option	d
-----------------	-----	----------------	---

**Explanation**

All lips, cheeks and tongue play the role of manipulation of food and holding them between the teeth.

Question Number	76.	Correct Option	c
-----------------	-----	----------------	---

**Explanation**

Mumps and measles viruses belong to group paramyxoviruses.

Question Number	77.	Correct Option	d
-----------------	-----	----------------	---

**Explanation**  
The hyphae that are not divided into cells by septum are non-septate and consist of a large multinucleated body. They are also called as coenocytic hyphae because cytoplasm moves effectively distributing the materials.

Question Number	78.	Correct Option	a
-----------------	-----	----------------	---

**Explanation**  
DNA stores all sorts of biological information coded in the sequence of its bases in a linear order, and genes are actually parts of DNA comprising its base sequences.

Question Number	79.	Correct Option	c
-----------------	-----	----------------	---

**Explanation**  
71% of Earth is covered with water, the rest 29% is covered by all the terrestrial ecosystems including tropical rain forest, desert and grassland which makes ocean ecosystem the largest one.

Question Number	80.	Correct Option	b
-----------------	-----	----------------	---

**Explanation**  
The ATP produced during light reactions provides chemical energy for the synthesis of sugar by reducing  $\text{CO}_2$ .

Question Number	81.	Correct Option	d
-----------------	-----	----------------	---

**Explanation**  
Homologous chromosomes start separating from each other during diplotene, however, the separation is incomplete. It is completed during diakinesis.

Question Number	82.	Correct Option	b
-----------------	-----	----------------	---

**Explanation**  
Germinating pollen grain is a rich source of auxins as well as it stimulates the tissues of the style and ovary to produce more auxins. This auxin is necessary for fruit set.

Question Number	83.	Correct Option	d
-----------------	-----	----------------	---

**Explanation**  
In tall trees, large quantities of water are carried at relatively high speed, up to 8 m/h.

Question Number	84.	Correct Option	d
-----------------	-----	----------------	---

**Explanation**  
The organisms produced as a result of cloning are susceptible to environmental stress and diseases. Clones also age rapidly.

Question Number	85.	Correct Option	c
-----------------	-----	----------------	---

**Explanation**  
Hepatitis is caused by H. virus which is spread through blood transfusion, by using contaminated syringes and surgical instruments.

Question Number	86.	Correct Option	b
-----------------	-----	----------------	---

**Explanation**  
In Pakistan Tundra ecosystem is located at high altitudes across the mountain above timberline such as mountains of Hindukush and Kara-koram.

Question Number	87.	Correct Option	b
-----------------	-----	----------------	---

**Explanation**  
Around 20-30 north and south latitude of every continent and also in the rain shadows of major mountain ranges, there exist deserts.

Question Number	88.	Correct Option	c
-----------------	-----	----------------	---

**Explanation**  
The most complex exoskeleton is found in arthropods. Their exoskeleton has made a variety of adaptations according to the environment that allow them to live and grow within their exoskeleton.



Question Number	89	Correct Option	b
-----------------	----	----------------	---

**Explanation**

A clone can either be a cell, molecule, gene or a complete organism.

Question Number	90	Correct Option	d
-----------------	----	----------------	---

**Explanation**

DNA ligase is used only in lagging strand where it joins the Okazaki fragments. However, all the other enzymes can act on either strand.

Question Number	91	Correct Option	d
-----------------	----	----------------	---

**Explanation**

Birds and mammals evolved from Archaeopteryx, that existed in Palaeozoic era. This means that Archaeopteryx were the ancestors of birds as well as mammals.

Question Number	92	Correct Option	d
-----------------	----	----------------	---

**Explanation**

Plants can utilize both nitrates and ammonium. Although plants can utilize ammonium directly, but nitrate is the form in which most nitrogen moves from the soil into the roots.

Question Number	93	Correct Option	c
-----------------	----	----------------	---

**Explanation**

The major cell infected by HIV is the helper T-lymphocyte.

Question Number	94	Correct Option	c
-----------------	----	----------------	---

**Explanation**

The major unit of ecology is ecosystem. Organisms interact with their environment within the confines of the ecosystem.

Question Number	95	Correct Option	d
-----------------	----	----------------	---

**Explanation**

When equal intensities are given, there is more photosynthesis in blue part of spectrum because light is also absorbed by accessory pigments in blue part which are not effectively transferred to chlorophyll a for use in photosynthesis.

Question Number	96	Correct Option	d
-----------------	----	----------------	---

**Explanation**

The detection of vibrations of ground by terrestrial vertebrates is achieved by receptors in the joints.

Question Number	97	Correct Option	c
-----------------	----	----------------	---

**Explanation**

The present goal of gerontology is not necessarily the increase in life span but to increase in health span of life.

Question Number	98	Correct Option	b
-----------------	----	----------------	---

**Explanation**

During zygotene, synaptonemal complex (pairing of homologous chromosomes) is formed and synapsis begins. The synaptonemal complex is highly specific.

Question Number	99	Correct Option	d
-----------------	----	----------------	---

**Explanation**

CSF has same composition as blood plasma, so functions as nutrition provider, waste remover and shock absorber. It bathes neurons of brain and spinal cord and it cushions against the bumps and jolts.

Question Number	100	Correct Option	a
-----------------	-----	----------------	---

**Explanation**

Percentage of NaCl in blood is one third of the total blood which is 0.3% of 1%.

# BIOLOGY PRACTICE SOLVED PAPER 2

1. Which of the following is not a constituent of soil?
  - a. Soil water
  - b. Soil air
  - c. Soil organisms
  - d. None of these
2. Which of the following is not a type of asexual reproduction?
  - a. Sporulation
  - b. Parthenogenesis
  - c. Apomixis
  - d. None of these
3. Hensen's node is formed at
  - a. Caudal end of primitive streak
  - b. Cephalic end of primitive streak
  - c. Caudal end of notochord
  - d. Cephalic end of notochord
4. The rate of photosynthesis may equal to one another at what time?
  - a. Dawn
  - b. Noon
  - c. Dusk
  - d. both a & b
5. Germinal epithelium of male reproductive system is present in
  - a. Seminiferous tubules
  - b. Vas deferens
  - c. Epididymis
  - d. Urinogenital duct
6. Microtubules are made up of
  - a. Tubulin protein
  - b. Actin protein
  - c. Tubulin + RNA
  - d. Tubulin + DNA
7. During emphysema, there is
  - a. Decreased surface area
  - b. Larger alveoli
  - c. Increased volume
  - d. All of the above
8. Closed circulatory system is present in which of the following?
  - a. Arthropods
  - b. Annelids
  - c. Molluscs
  - d. Protochordates
9. A cillum consists of \_\_\_\_\_ fibrils.
  - a. 20
  - b. 18
  - c. 9
  - d. 3
10. Which of the following is not an organic compound?
  - a. Metabolites
  - b. Hormones
  - c. Proteins
  - d. Water
11. Which of the following is not a secretion of bile?
  - a. Amylase
  - b. Trypsin
  - c. Lipase
  - d. Sucrase
12. The cell division at root and shoot apices occurs in cells that lack
  - a. Mitochondria
  - b. Vacuoles
  - c. Chloroplasts
  - d. Leucoplasts
13. Ptyalin is a carbohydrate-digesting enzyme that breaks starch and glycogen into
  - a. Lactose
  - b. Glucose
  - c. Maltose
  - d. Fructose
14. Which of the following is not true about plasmids?
  - a. They are extra-chromosomal DNA
  - b. They carry genes for fertility
  - c. They carry genes for anti-biotic resistance
  - d. None of the above
15. In case of less water in body, which of the following occur?
  - a. More ADH is released from pituitary gland
  - b. Less ADH is released from pituitary gland
  - c. More ADH is produced by adrenal gland
  - d. Less ADH is produced by adrenal gland

16. In Isobilateral leaves, the stomata are present in
  - a. Only upper epidermis
  - b. Only lower epidermis
  - c. Both in upper and lower epidermis
  - d. None of the epidermis
17. According to endosymbiont hypothesis, flagella may have arisen by the ingestion of \_\_\_\_\_ bacteria.
  - a. Spirochetes
  - b. Bacillus with flagella
  - c. Vibrio
  - d. Cocci
18. Genes of a linkage group
  - a. Assort independently
  - b. Increase the chances of genetic recombination
  - c. Causes variation among offspring
  - d. Can be separated by crossing over
19. Which of the following diseases is not caused by a virus?
  - a. Pneumonia
  - b. Small pox
  - c. Influenza
  - d. Hepatitis
20. \_\_\_\_\_ acts as magnetic forms that promotes and guides the coiling of DNA.
  - a. RNA
  - b. Phosphate group
  - c. Histone cores
  - d. None of these
21. \_\_\_\_\_ neurons branch profusely giving cell a tree like appearance.
  - a. Motor neurons
  - b. Sensory neurons
  - c. Associated neurons
  - d. Neuroglial cells
22. Which of the following has more number of chlorophyll a, chlorophyll b and carotenoids molecules?
  - a. Antenna complex
  - b. Reaction center
  - c. Electron transport chain
  - d. None of the above
23. Strobilli are present in
  - a. Sphenopsida
  - b. Psilopsida
  - c. Lycopsidea
  - d. Prteropsida
24. Haemocyanin is a respiratory pigment which color?
  - a. Red
  - b. Purple
  - c. White
  - d. Blue
25. Capsomeres which are the subunits of capsid are made up of
  - a. Vitamins
  - b. Proteins
  - c. Carbohydrates
  - d. Lipids
26. \_\_\_\_\_ helps cockroach in flight.
  - a. Anterior pair of wings
  - b. Posterior pair of wings
  - c. Middle leg
  - d. Both A and B
27. The deficiency of which of the following causes chlorosis?
  - a. Nitrogen
  - b. Potassium
  - c. Magnesium
  - d. Both A and C
28. Which of the following is an example of red algae?
  - a. Chlorella
  - b. Polysiphonia
  - c. Chlamydomonas
  - d. Trichonympha
29. Food digestion occurs in all of the following parts of human digestive system except
  - a. Stomach
  - b. Large intestine
  - c. Small intestine
  - d. Oral cavity
30. Stone cancer occurs in
  - a. Stone
  - b. Lungs
  - c. Skin
  - d. Blood

After crossing over

- All gametes have recombinant genes.
- All gametes have parental combination of genes.
- Half have parental and half have recombinant genes.
- Ratio of recombinant and parental combination is 1:2.

The smallest bacteria Mycoplasma is of the size

- 1-10 nm
- 10-100 nm
- 200-300 nm
- 100-200 nm

3. A cell commits suicide because of the absence of

- Survival signals
- Trophic factors
- Killing signals
- Both A and B

4. \_\_\_\_\_ is the raw material in natural cycle for making food.

- $\text{CO}_2$
- $\text{CO}_2 + \text{O}_2$
- $\text{CO}_2 + \text{N}_2$
- $\text{O}_2$

35. What is the correct order of evolution of seed habit?

1. Evolution of heterospory
  2. Development of protective layers around megasporangium
  3. Modification of distal end of megasporangium for pollen capture
  4. Retention and germination of megaspore within megasporangium
  5. Reduction to a single functional megaspore per sporangium
  6. Development of embryo sac within the sporangium
- 1, 3, 4, 2, 5, 6
  - 6, 4, 1, 3, 2, 5
  - 1, 4, 2, 5, 6, 3
  - 1, 3, 6, 4, 5, 2

36. Which of the following is true about Sickle cell anemia?

- Adenine changes with thymine resulting in glutamic acid to valine.
- Thymine changes with adenine resulting in glutamic acid to valine.
- Adenine changes with thymine resulting in valine to glutamic acid.
- Thymine changes with adenine resulting in valine to glutamic acid.

37. Evolutionary relationship among species are reflected in their \_\_\_\_\_

- DNA and proteins
- Only DNA
- Only proteins
- RNA

38. The size of parvoviruses is

- 10 nm
- 20 nm
- 150 nm
- 250 nm

39. Oncoviruses are retroviruses which are

- Single stranded
- Double stranded
- None of the above
- Both single and double stranded at different stages of life

40. Ammonia is the excretory product of \_\_\_\_\_ animals.

- Marine
- Freshwater
- Mammals
- Birds

41. Which of the following STD affects CNS, reproductive organs, heart and skin?

- Gonorrhea
- Syphilis
- Genital herpes
- AIDS

42. Which of the following is directly proportional to the oxygen carrying capacity of blood?

- pH
- Carbon dioxide
- Temperature
- All of the above



43. The volume of phage is about
- 1/1000 times the host
  - 1/10 times the host
  - 1/100 times the host
  - 1/10,000 times the host
44. Glandular tissue performs which of the following function?
- Secretion
  - Conduction
  - Contraction
  - Translocation
45. Which of the following is false?
- Nitrogen is present in proteins
  - Magnesium is present in chlorophyll
  - Calcium is present in cytochromes
  - Phosphorus is present in ATP
46. Planaria and hydra have which the following in common?
- Both are Cnidarian.
  - Food is digested in the intestine.
  - Both have sac-like digestive system.
  - All of the above
47. Change in pH causes changes in
- Ionization of amino acids at active site.
  - Bonds in enzymes.
  - Ionization of substrates.
  - All of the above.
48. Parietal cells of the gastric gland secrete
- Mucous
  - Hydrochloric acid
  - Pepsinogen
  - All of the above
49. Auxins are involved in
- Phototropism
  - Negative gravitropism
  - Positive gravitropism
  - All of the above
50. Photorespiration reduces the amount of carbon fixed into carbohydrates by
- 15%
  - 25%
  - 45%
  - 35%
51. Acylglycerols are formed by the reaction of glycerol (alcohol) and fatty acids. They fall under the category of
- Ether
  - Ketone
  - Aldehyde
  - Ester
52. \_\_\_\_\_ nerves are connected to the brain.
- 12
  - 24
  - 31
  - 62
53. Myoglobin is present in \_\_\_\_\_ of skeletal muscle fiber.
- Sarcoplasmic reticulum
  - Nucleus
  - Sarcolemma
  - Sarcoplasm
54. \_\_\_\_\_ is the form of nitrogen that can be utilized by plants.
- Nitrate
  - Ammonium
  - Nitrite
  - Both A & B
55. Which of the following is not true about law of segregation?
- Alleles segregate during meiosis.
  - Each gamete receives only one allele.
  - Alleles unite during specific fertilization
  - All are true.
56. How many chromosomes are present in garden pea?
- 8
  - 46
  - 14
  - 26
57. What is gene pharming?
- Production of pharmaceuticals.
  - Production of pharmaceuticals from animals.
  - Production of pharmaceuticals from plants.
  - Production of pharmaceuticals from microorganisms.

58. During gel electrophoresis, the gel used is

- a. Agar gel
- b. Agarose gel
- c. Dextran
- d. Toluene gel

59. The enzymes involved in the synthesis of proteins are present in

- a. Chloroplasts
- b. Mitochondria
- c. Nucleolus
- d. Ribosomes

60. In which type of plants sporophyte is completely dependent on gametophyte?

- a. Bryophytes
- b. Spermatophytes
- c. Angiosperms
- d. Gymnosperms

61. The color of bile is

- a. Red
- b. Blue
- c. Yellow
- d. Green

62. Between which two carbon atoms is the double bond in Oleic acid is present?

- a. 4 and 5
- b. 7 and 8
- c. 9 and 10
- d. 13 and 14

63. \_\_\_\_\_ type of nervous system is present in jelly fish.

- a. Diffused nervous system
- b. Centralized nervous system
- c. Both
- d. None

64. Rat (rodent) is

- a. Plantigrade
- b. Digitigrade
- c. Unguligrade
- d. None of the above

65. The mode of locomotion in Foraminifera is;

- a. Flagella
- b. Pseudopodia
- c. Cilia
- d. None

66. Which of the following structures is not found in all bacteria?

- a. Plasmid
- b. Capsule
- c. Cell membrane
- d. Cell wall

67. What is the sequence of vertebrate evolution?

- a. Fish, amphibians, reptiles, birds, mammals
- b. Fish, amphibians, reptiles, mammals, birds
- c. Fish, reptiles, amphibians, birds, mammals
- d. Fish, reptiles, amphibians, mammals, birds

68. In cockroach, the blood passes from haemocoel in head to

- a. Perineural sinus
- b. Pericardial sinus
- c. Perivisceral sinus
- d. All of the above

69. Lamarck's theory is not accepted because

- a. Mechanism to explain evolution wasn't enough.
- b. Parts of body that are used extensively become larger and stronger.
- c. Parts of body that are not used deteriorate.
- d. Inheritance of acquired characters.

70. Which of the following induces ovulation?

- a. FSH
- b. LH
- c. Estrogen
- d. Progesterone

71. The change of a reducing atmosphere to oxidizing atmosphere means life can no longer arise \_\_\_\_\_

- a. Biologically
- b. Abiotically
- c. Photosynthetically
- d. None of the above

72. Studies have revealed that the nitrogenous compounds present in honey dew are

- a. 1%
- b. 10-25%
- c. 50%
- d. 90%

73. Which of the following gives rise to CNS in chick?
- Ectoderm
  - Endoderm
  - Mesoderm
  - All of the above
74. Cactus has water stored in \_\_\_\_\_ tissue.
- Sclerenchyma
  - Collenchyma
  - Parenchyma
  - Vascular cambium
75. To bend the arm at elbow joint, which of the following occurs?
- Biceps contract, triceps relax
  - Biceps relax, triceps contract
  - Brachialis contracts, brachioradialis relaxes
  - Brachialis relaxes, brachioradialis contracts
76. The following reaction occurs in
- $$2 \text{ glycine} \rightarrow \text{serine} + \text{CO}_2$$
- Cytoplasm
  - Stroma
  - Thylakoid membrane
  - Mitochondria
77. All or none response is based upon
- All muscle fibers participate in contraction.
  - All myofilament contract together.
  - All myofibril contract together.
  - The whole muscle bundle participates in contraction.
78. \_\_\_\_\_ is a major constituent of birth control pill.
- FSH
  - LH
  - Estrogen
  - Progesterone
79. Which of the following is false about hepaticopsida?
- Their common name is liverworts.
  - Porella is a liverwort.
  - The plant body is gametophyte.
  - Gametophyte is dependent on sporophyte.
80. Hydroponic culture technique is used to
- Check the composition of the soil
  - Grow plants with high yields
  - Test whether a certain nutrient is essential for plant
  - Both A and C
81. Which of the following is not true about grey crescent?
- Pigmented
  - Pigment free
  - Necessary for development
  - All of the above
82. Phytoplankton does not include
- Protista
  - Small plants
  - Bacteria
  - Algae
83. On an average, how many thylakoids pile up to form granum?
- 20
  - 30
  - 40
  - 50
84. Which of the following is not correct according to Lock and Key model?
- A specific enzyme can transform a specific substrate.
  - There can be modification in active site.
  - Active site is rigid.
  - Active site acts as a template during a reaction.
85. Which of the following is the shortest phase?
- Gap 1 phase
  - Synthesis phase
  - Pre-mitotic phase
  - Mitotic phase
86. Which of the following structures is not a part of flower
- Pedicel
  - Frond
  - Thalamus
  - Floral leaves

87. In cockroach, water and salts are reabsorbed by

- a. Rectum
- b. Intestine
- c. Malpighian tubules
- d. Midgut

88. When a water molecule is added to fumarate, it produces

- a. Oxaloacetate
- b. Malate
- c. Succinate
- d. Citrate

89. Some plants like ebony store their waste material in

- a. Old xylem
- b. Phloem
- c. Leaves
- d. Cork

90. During DNA fingerprinting, result is obtained in the form bands in \_\_\_\_\_.

- a. Autoradiograph
- b. Projectional radiograph
- c. Panoramic radiograph
- d. Tomograph

91. Root nodules in legume plants is formed by

- a. Algae
- b. Fungus
- c. Bacteria
- d. Lichen

92. The chemical substances that inhibit growth of micro organisms on living tissues are

- a. Disinfectants
- b. Antiseptics
- c. None of the above
- d. Chemotherapeutics

93. Population genetics emphasizes extensive genetic variation within population and recognize the importance of \_\_\_\_\_ characters.

- a. Acquired
- b. Qualitative
- c. Quantitative
- d. None of the above

94. Which of the following should be used if large amount of gene is required?

- a. ELISA
- b. PCR
- c. Genetic engineering
- d. Tissue culture

95. Central dogma is

- a. Only transcription
- b. DNA replication + transcription
- c. Transcription + translation
- d. DNA replication + transcription + translation

96. Which of the following causes African sleeping sickness?

- a. Euglena
- b. Trypanosoma
- c. Paramecium
- d. Entamoeba histolytica

97. Which of the following cannot be removed by sewage treatment?

- a. Phosphorus
- b. Aluminum
- c. Lead
- d. Copper

98. The enzyme succinic dehydrogenase converts succinic acid into

- a. Fumaric acid
- b. Lactic acid
- c. Butaric acid
- d. Both B and C

99. Cancers can be treated by which of the following techniques?

- a. Radiotherapy
- b. Chemotherapy
- c. Gene therapy
- d. both a & b

100. Inert nitrogen pool contains

- a. Ammonia and ammonium ions
- b.  $N_2$
- c.  $N_2$  and ammonium
- d.  $N_2$  and ammonia



# ANSWERS & EXPLANATIONS

Question  
Number

1

Correct  
Option

d

## Explanation

Soil can be defined as the upper layer of Earth's crust. The basic constituents of soil are soil particles, soil water, soil air and inorganic matter and soil organisms.

Question  
Number

2

Correct  
Option

d

## Explanation

Sporulation, parthenogenesis and apomixis, all are types of asexual reproduction.

Question  
Number

3

Correct  
Option

b

## Explanation

At the cephalic end of primitive streak, closely packed cells form a local thickening known as Hensen's node.

Question  
Number

4

Correct  
Option

d

## Explanation

The rate of photosynthesis may, for a short time, equal one another at dawn and dusk when the light intensity is low. At such time there is no net exchange of gases with the environment, this is termed as compensation point.

Question  
Number

5

Correct  
Option

a

## Explanation

In male reproductive system, seminiferous tubules contain germinal epithelium that produces spermatogonia by repeated divisions of cells of germinal epithelium.

Question  
Number

6

Correct  
Option

c

## Explanation

Micro tubules are made up of tubulin protein and traces of RNA.

Question  
Number

7

Correct  
Option

## Explanation

In patients with emphysema, alveolar walls degenerate, alveoli combine to form larger alveoli. As a result, there is increased volume and decreased surface area of alveoli.

Question  
Number

8

Correct  
Option

## Explanation

Annelids have closed circulatory system while arthropods, molluscs, and protochordates have an open circulatory system.

Question  
Number

9

Correct  
Option

## Explanation

9 peripheral double fibrils + 2 central fibrils

= 18 fibrils + 2 fibrils

= 20 fibrils

Question  
Number

10

Correct  
Option

## Explanation

Water is the only inorganic compound. Proteins, carbohydrates and lipids are the organic compounds.

Question  
Number

11

Correct  
Option

## Explanation

Amylase, trypsin and lipase are secretions of pancreas. Sucrase is a secretion of small intestine.

Question  
Number

12

Correct  
Option

## Explanation

The cell division at the roots and shoots occurs in small cells having spherical nuclei present in the center of cytoplasm, non-vacuolated.

Question Number	13	Correct Option	c
<b>Explanation</b> Ptyalin is a carbohydrate-digesting enzyme present in saliva. It digests starch and glycogen to maltose.			
Question Number	14	Correct Option	d
<b>Explanation</b> Plasmids are natural extra-chromosomal circular DNA molecules which carry genes for antibiotic resistance and fertility etc. Hence, all of these are true about the characteristics of plasmids.			
Question Number	15	Correct Option	b
<b>Explanation</b> If there is less water in body, it needs to be saved and should not be excreted in high amounts. For this purpose, ADH acts on collecting tubules to reabsorb water.			
Question Number	16	Correct Option	c
<b>Explanation</b> In isobilateral leaves, the stomata are present in both upper and lower epidermis e.g. lily and maize leaf.			
Question Number	17	Correct Option	a
<b>Explanation</b> According to endosymbiont hypothesis, spirochetes engulfed by larger bacteria that were not digested, rather were stabilized inside the cell resulted in the formation of flagella that helped the cell in locomotion.			
Question Number	18	Correct Option	d
<b>Explanation</b> Linked genes are present on different loci on the same chromosome, hence they are separated by crossing over in which there is an exchange of segments between non-sister chromatids. This leads to the separation of linked genes.			

Question Number	19	Correct Option	a
<b>Explanation</b> All of the above diseases are caused by viruses except pneumonia which is a bacterial disease.			
Question Number	20	Correct Option	c
<b>Explanation</b> Histone cores are positively charged and are strongly attracted to negatively charged phosphate groups of the DNA. The histone cores thus act as magnetic forms that promote and guide the coiling of DNA.			
Question Number	21	Correct Option	c
<b>Explanation</b> The dendrites of certain brain cells branch profusely, giving cell a treelike appearance. The neurons present in the brain are associated neurons.			
Question Number	22	Correct Option	a
<b>Explanation</b> The light gathering 'antenna complex' has more number of chlorophyll a, chlorophyll b and carotenoids molecules.			
Question Number	23	Correct Option	c
<b>Explanation</b> In lycopodium, the sporophylls are clustered at the tips of branches into club-shaped structures called strobilli.			
Question Number	24	Correct Option	d
<b>Explanation</b> In phylum Mollusca, a respiratory pigment of blue color, called haemocyanin is present.			

Question Number	25	Correct Option	b
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**Explanation**

Capsomeres are protein subunits that make up the capsid.

Question Number	26	Correct Option	b
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**Explanation**

Out of two pairs, posterior pair helps cockroach in flight. These beat in air in such a manner that they support the body weight and drive it through the air.

Question Number	27	Correct Option	d
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**Explanation**

The deficiency of both nitrogen and magnesium cause chlorosis, however the deficiency of nitrogen causes strong chlorosis.

Question Number	28	Correct Option	b
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**Explanation**

Polysiphonia is a representative red alga with worldwide distribution.

Question Number	29	Correct Option	b
-----------------	----	----------------	---

**Explanation**

There is no digestion in large intestine. Here, only salts and water are absorbed into the blood stream.

Question Number	30	Correct Option	a
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**Explanation**

Stone monuments like Taj Mahal are being eroded due to stone cancer caused by acid rains.

Question Number	31	Correct Option	c
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**Explanation**

After crossing over, segments of non-sister chromatids are exchanged and out of four gametes formed, two have parental genes while the remaining two have recombinant genes.

Question Number	32	Correct Option	d
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**Explanation**

The diameter of some members of Mycoplasmas varies from 200 nm.

Question Number	33	Correct Option	d
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**Explanation**

Cell commits suicide in the absence of survival signals (trophic factors) or killing factors. If killing factors are present, cells are murdered by other cells.

Question Number	34	Correct Option	c
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**Explanation**

For making food and other substances required by living system. Carbon dioxide and Nitrogen are required; CO<sub>2</sub> for making glucose and N<sub>2</sub> for amino acids.

Question Number	35	Correct Option	c
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**Explanation**

The correct steps of evolution are 1, 4, 2, 5, 6, 3.

Question Number	36	Correct Option	b
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**Explanation**

In Sickle cell anemia, critical change replaces thymine with adenine at the position that codes for glutamic acid converting position to valine.

Question Number	37	Correct Option	a
<b>Explanation</b> Evolutionary relationship among species are reflected in their DNA and proteins – in their genes and gene products. If the sequences of monomers of genes and proteins of two species match closely, the sequence must have been copied from a common ancestor.			

Question Number	38	Correct Option	b
<b>Explanation</b> The size of parvovirus is 20 nm.			

Question Number	39	Correct Option	a
<b>Explanation</b> Oncoviruses are single stranded RNA tumour viruses and are spherical in form about 100 nm in diameter and enveloped by host plasma membrane.			

Question Number	40	Correct Option	b
<b>Explanation</b> Freshwater is hypotonic in nature and 1g of ammonia requires 500ml of water for its removal. Hence, in freshwater animals, the excretion of excretory products as well as water takes place simultaneously.			

Question Number	41	Correct Option	b
<b>Explanation</b> Syphilis is caused by <i>Treponema pallidum</i> . It damages the reproductive organs, eyes bones joints, central nervous system, heart and skin.			

Question Number	42	Correct Option	a
<b>Explanation</b> Carbon dioxide and temperature are inversely proportional whereas pH is directly proportional to the oxygen carrying capacity of the blood.			

Question Number	43	Correct Option	a
<b>Explanation</b> The volume of the phage is about 1/1000 times the host cell.			

Question Number	44	Correct Option	a
<b>Explanation</b> Glandular tissue is present in animals where they secrete of hormones and other secretions.			

Question Number	45	Correct Option	c
<b>Explanation</b> Cytochromes do not contain calcium, rather they contain iron.			

Question Number	46	Correct Option	c
<b>Explanation</b> Both hydra and planaria have a single opening to the outside called mouth. This is a common opening for ingestion and egestion. Such a digestive system is called sac-like digestive system.			

Question Number	47	Correct Option	d
<b>Explanation</b> A slight change in pH can change the ionization of the amino acids present at the active site. Moreover, it may affect the ionization of the substrates. Under these conditions, enzyme activity is either retarded or completely blocked. Extreme changes can cause the bonds in enzymes to break.			

Question Number	48	Correct Option	b
<b>Explanation</b> Parietal or oxyntic cells of gastric glands secrete hydrochloric acid, mucous cells secrete mucous, and zymogen cells secrete pepsinogen.			



Question Number	49	Correct Option	d
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#### Explanation

Auxins cause unequal cell enlargement which causes bending in different directions and all phototropism, negative gravitropism and positive gravitropism are related to the bending of plants.

Question Number	50	Correct Option	b
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#### Explanation

In most plants, photorespiration reduces the amount of carbon fixed into carbohydrates by 25%.

Question Number	51	Correct Option	d
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#### Explanation

As a result of reaction between glycerol and fatty acids, water molecules are released, and an ester is formed. Hence, acylglycerols are esters in nature.

Question Number	52	Correct Option	b
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#### Explanation

12 pairs of cranial nerves arise from the brain or lead to the brain. Some of these nerves are sensory, some motor, and some are mixed.

Question Number	53	Correct Option	d
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#### Explanation

Sarcoplasm of the muscle fiber is similar to the cytoplasm of other cells, but it contains usually large amount of stored glycogen and unique oxygen bonding protein myoglobin, a red pigment that stores oxygen.

Question Number	54	Correct Option	d
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#### Explanation

Plants can utilize both nitrates and ammonium. Although plants can utilize ammonium directly, but nitrate is the form in which most nitrogen moves from the soil into the roots.

Question Number	55	Correct Option	c
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#### Explanation

According to law of segregation, the two coexisting alleles for each trait segregate at meiosis, so that each gamete receives only one of the two alleles. Alleles unite again at random fertilization of gametes when zygote is formed.

Question Number	56	Correct Option	c
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#### Explanation

There are 14 chromosomes present in garden pea.

Question Number	57	Correct Option	c
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#### Explanation

Gene pharming is the method for the production of pharmaceuticals from farm animals. Farm animals are used because the desired proteins appear in their milk.

Question Number	58	Correct Option	b
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#### Explanation

Agarose gel is used during gel electrophoresis. The restriction fragments can be separated according to their length (molecular weight or size) when its run on the agarose gel.

Question Number	59	Correct Option	d
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#### Explanation

The enzymes that are involved in the synthesis of proteins are integral part of ribosomes.

Question Number	60	Correct Option	a
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#### Explanation

In bryophytes, the sporophyte is completely dependent on gametophyte. However, in the others, sporophyte is not dependent on gametophyte.

Question Number 61 Correct Option d

**Explanation**  
The green color of bile is due to bile pigments which are formed from the breakdown of hemoglobin.

Question Number 62 Correct Option c

**Explanation**  
The double bond in oleic acid is present between C<sub>9</sub> and C<sub>10</sub> as shown in the diagram below.  
*Imageresultforoleicacid*

Question Number 63 Correct Option a

**Explanation**  
Jelly fish belongs to cnidarians; hence it has diffused nervous system.

Question Number 64 Correct Option b

**Explanation**  
Rodents are digitigrades i.e., they walk on their digits only.

Question Number 65 Correct Option b

**Explanation**  
Foraminifera move with the help of their pseudopods.

Question Number 66 Correct Option b

**Explanation**  
Cell wall, cell membrane and plasmid are found in all bacteria. However, capsule derived from host is not present in all bacteria.

Question Number 67 Correct Option a

**Explanation**  
The correct order of vertebrate evolution is Fish, amphibians, reptiles, birds, mammals. Fish were the earliest vertebrates from which all the others evolved.

Question Number 68 Correct Option c

**Explanation**  
In cockroach, the blood flows from heart to aorta, to haemocoel, perivisceral sinus, to perineural sinus, to perivisceral sinus, to pericardial sinus, and to heart through ostia.

Question Number 69 Correct Option d

**Explanation**  
Lamarck's theory is not accepted because acquired characters cannot be inherited. In the modern concept of heredity, the modifications an organism acquires during its lifetime cannot be passed along to its offspring.

Question Number 70 Correct Option b

**Explanation**  
Luteinizing hormone (LH), secreted by pituitary gland as a result of decrease in FSH and increase of estrogen, induces ovulation - release of ovum from the follicle.

Question Number 71 Correct Option b

**Explanation**  
When a reducing atmosphere changes to an oxidizing one, organisms can no longer arise by abiotic means because now there is oxygen in the air that can be used to produce energy.

Question Number 72 Correct Option a

**Explanation**  
The composition of honey dew revealed that it contains about 20% nitrogenous compounds.

Question Number	73	Correct Option	a
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**Explanation**

Ectoderm form neural tube which further forms brain and spinal cord.

Question Number	74	Correct Option	c
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**Explanation**

Succulent plants such as cactus have water stored in large parenchyma tissues, thus they can withstand prolonged periods of water shortage.

Question Number	75	Correct Option	a
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**Explanation**

At the elbow joint, biceps and triceps work against each other in the form of an antagonistic pair. In order to bend the arm, biceps contract and triceps relax and vice versa in the case of straightening the arm.

Question Number	76	Correct Option	d
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**Explanation**

Glycine soon after its formation diffuses into the mitochondria where two glycine molecules are converted into serine and carbon dioxide molecule is formed.

Question Number	77	Correct Option	c
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**Explanation**

All or none principle states that all of its myofibrils take part in contraction. The degree of contraction depends upon the number of fibrils that participate in contraction.

Question Number	78	Correct Option	d
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**Explanation**

Progesterone inhibits further FSH secretion from the pituitary, thus preventing any more follicles from ripening. Hence, it suppresses ovulation so is a part of birth control pill.

Question Number	79	Correct Option	
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**Explanation**

In the phylum hepaticopsida, the sporophyte generation is dependent on the gametophyte generation.

Question Number	80	Correct Option	
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**Explanation**

Question Number	81	Correct Option	
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**Explanation**

Grey crescent is a pigmented structure and its cytoplasmic streaming is information essential for development. It cannot be pigmented.

Question Number	82	Correct Option	
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**Explanation**

Phytoplankton (Greek "drifting plants") include photosynthetic Protista, bacteria and algae. Small plants are not classified as phytoplankton.

Question Number	83	Correct Option	
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**Explanation**

On an average, about 50 thylakoids pile up to form a granum.

Question Number	84	Correct Option	
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**Explanation**

According to the Lock and Key model, there can be no modification or flexibility in the active site before, during or after the reaction.

Question Number	85	Correct Option	
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**Explanation**

Mitotic phase is the shortest phase that lasts only 30 minutes. Pro phase is of 9 hours, S phase 10 hours and G<sub>2</sub> phase 10 hours.

Question Number	86	Correct Option	b
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**Explanation**  
A flower is a modified shoot which consists of a pedicel, thalamus or torus, and floral leaves (sepals, petals, stamens and carpels). However, fronds are the leaves in pteropsida.

Question Number	87	Correct Option	a
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**Explanation**  
Rectum reabsorbs most of the salts and water. Thus, nitrogenous wastes are excreted as solid excreta, in the form of uric acid crystals along with feces.

Question Number	88	Correct Option	b
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**Explanation**  
With the addition of an H<sub>2</sub>O molecule, malate is formed from fumarate.

Question Number	89	Correct Option	a
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**Explanation**  
Old xylem is no longer used for water transport, so some waste chemicals are deposited in it, this gives this xylem a black color.

Question Number	90	Correct Option	a
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**Explanation**  
The results of DNA fingerprinting are obtained using X-rays that appear as black bands in autoradiograph.

Question Number	91	Correct Option	c
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**Explanation**  
The legume plants are host to symbiont bacteria, which inhabit the roots forming root nodules. The bacteria in root nodules fix nitrogen in soil from air, converting it into amino acid, which the plants use. In return, the plants provide bacteria with food and protection.

Question Number	92	Correct Option	b
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**Explanation**  
Antiseptics are the chemical substances that inhibit growth of microorganisms on living tissues.

Question Number	93	Correct Option	c
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**Explanation**  
Population genetics deals with the quantitative characters within population.

Question Number	94	Correct Option	c
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**Explanation**  
If large quantity of gene is required, the recombinant DNA technology is used popularly known as genetic engineering.

Question Number	95	Correct Option	c
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**Explanation**  
Central dogma of gene expression means synthesis of proteins that involves transcription and translation. The genetic information flows down into RNA which is then converted into protein.

Question Number	96	Correct Option	b
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**Explanation**  
Trypanosoma is a human parasite that belongs to zooflagellates causes African sleeping sickness. It is transmitted by the bite of tsetse fly.

Question Number	97	Correct Option	a
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**Explanation**  
Some detergents contain a lot of phosphate that is not removed by sewage treatment and is discharged into rivers. The large amount of phosphate encourages the growth of microscopic plants called eutrophication that affects the force of aquatic reservoir.



Question Number	98	Correct Option	a
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**Explanation**

The product of the action of succinic dehydrogenase on succinic acid is Fumaric acid.

Question Number	99	Correct Option	d
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**Explanation**

In cancer both radiotherapy and chemotherapy are used. In radiotherapy, short wave radiations are used while in chemotherapy, certain anticancer chemicals are given to the patients. However, gene therapy is used to repair defective genes.

Question Number	100	Correct Option	b
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**Explanation**

Inert nitrogen pool only contains inert nitrogen molecules in the form of  $N_2$ .

# BIOLOGY PRACTICE SOLVED PAPER 3

1. The number of ascospores produced by each ascus are

- 2
- 4
- 16
- 8

2. The sense organs of nematodes are

- Cilia
- Papillae
- Tentacles
- all of the above

3. Which of the following factors is responsible for bleeding in plants?

- Hydrostatic pressure
- Root pressure
- Cohesion-tension forces
- Both A and B

4. The distribution of organisms in space can be studied through

- Biome
- Community
- Zoogeography
- Social biology

5. Oral and vaginal thrush are caused by which of the following fungi?

- Candida albicans
- Aspergillus fumigatus
- Saccharomyces cervisiae
- Omphalotus olearius

6. During gene sequencing

- DNA strands are cut into pieces.
- Only chain terminated nucleotides are marked with fluorescent dye.
- DNA strands of different sizes are synthesized.
- All of the above

7. Which of the following is not true about meiosis?

- It takes place in diploid cells.
- Chromosomal material is not doubled.
- It is reduction division.
- Forms spores in plants.

8. Lifespan of RBC's is

- 100 days
- 110 days
- 120 days
- 130 days

9. Muscle fatigue causes

- Accumulation of lactic acid
- Ionic imbalance
- pH drop
- All of the above

10. The indehiscient fruit in which fruit wall is complete and fused with seed coat is

- Pod
- Legume
- Caryopsis
- Both A and B

11. When an oxygen pressure is 115mm mercury, hemoglobin contains \_\_\_\_\_ ml of oxygen per 100ml of blood.

- 19
- 20
- 19.6
- 98

12. \_\_\_\_\_ is related to human genome project.

- To construct a genetic map
- To construct a base sequence map
- To do gene sequencing
- Both A and B

13. Lateral meristem is not present in

- Monocot plants
- Dicot plants
- Gymnosperms
- None of the above

14. The driving force behind every natural cycle is

- Sun
- Air
- Plants
- Animals

15. Rhodophyta have how many flagella?

- 1
- 2
- 3
- None

16. Silicon carbide needles are used in \_\_\_\_\_ method(s) to produce transgenic animals.

- Micro injection of foreign genes
- Vortex mixing
- Agitation method
- All of the above

- 2020/08 21
17. *Permellia* is an example of \_\_\_\_\_ stage.
    - a. Moss
    - b. Foliage lichen
    - c. Crustose lichen
    - d. Herbaceous
  18. In case of X-linked recessive trait, if a carrier mother marries a normal individual, the ratio of infected to carrier to normal offspring will be
    - a. 1: 1: 1
    - b. 1: 2: 2
    - c. 2: 1: 1
    - d. 1: 1: 2
  19. Primitive gut is the cavity between
    - a. Ectoderm and mesoderm
    - b. Yolk and ectoderm
    - c. Yolk and endoderm
    - d. Endoderm and mesoderm
  20. Plants are most diverse in littoral zone of lake and animals are most diverse in \_\_\_\_\_ zone.
    - a. Littoral
    - b. Limnetic
    - c. Profundal
    - d. Soil bed
  21. Glycogen is stored in
    - a. Liver
    - b. Kidney
    - c. Pancreas
    - d. Intestine
  22. The maximum temperature fungi can tolerate is
    - a. -5 degrees Celsius
    - b. -10 degrees Celsius
    - c. 5 degrees Celsius
    - d. 0 degrees Celsius
  23. The vegetative cells which accumulate food and become resting spores are called
    - a. Hormogonia
    - b. Heterocysts
    - c. Akinetes
    - d. Trichomes
  24. Bacteriophages were discovered by
    - a. Twort
    - b. Pateur
    - c. D'Herelle
    - d. Both a & c
  25. Morphogenetic determinants are present in the cytoplasm of
    - a. Epiblast cells
    - b. Hypoblast cells
    - c. Hensen's node
    - d. Blastomeres
  26. Mouse eared cress has been engineered
    - a. To degrade plastic
    - b. To produce biodegradable plastic
    - c. To produce Aluminum
    - d. To produce PVC
  27. Bilirubin is the end product of
    - a. Creatine
    - b. Albumin
    - c. Citrulline
    - d. Hemoglobin
  28. Which of the following fungi is not edible?
    - a. Morels
    - b. Truffles
    - c. Mushrooms
    - d. Toadstools
  29. In lithotripsy, which type of waves are used?
    - a. X-rays
    - b. Ultrasound
    - c. Infrared
    - d. Both A and B
  30. During cloning, the nucleus of egg cells is destroyed by \_\_\_\_\_ radiations.
    - a. X-rays
    - b. Ultraviolet
    - c. Infrared radiations
    - d. Gamma radiations
  31. Transgenic plants are made by using \_\_\_\_\_ on protoplast.
    - a. Electric shock
    - b. UV rays
    - c. Infrared rays
    - d. X-rays

32. The rapid growth and spread of hyphae is due to

- a. Large number of mitochondria
- b. Cytoplasmic flow throughout hyphae
- c. Multi nucleate nature of fungi
- d. Presence of cell wall

33. Horse is an example of

- a. Rodents
- b. Ungulates
- c. Both a & b
- d. None

34. A pyramid of energy represents energy transfer in community level in \_\_\_\_\_ unit.

- a. Kilocalories
- b. Kilocalories/ meter square
- c. Kilocalories/ year
- d. Kilocalories/ meter square/ year

35. Which of the following is ribo-nucleo protein particle?

- a. Nucleosome
- b. rRNA
- c. Ribosome
- d. none of the above
- e. none of the above

36. Some species of *Aspergillus* are used for producing

- a. Soya sauce
- b. Citric acid
- c. Soya paste
- d. All of the above

37. The pigments that absorb yellow to orange light are

- a. Bacteriochlorophylls
- b. Xanthophylls
- c. Chlorophyll
- d. Carotenoids

38. Which of the following produces testosterone?

- a. Seminiferous tubules
- b. Sertoli cells
- c. Interstitial cells
- d. Prostate gland

39. The hydrogen produced by splitting of water is used to

- a. Krebs cycle
- b. Respiration
- c. Phosphorylation
- d. Produce glucose

40. Grasslands present in temperate climates are called \_\_\_\_\_.

- a. Savanna
- b. Prairies
- c. Taiga
- d. Boreal

41. If the division of bacteria is in one plane, it will produce

- a. Staphylococci
- b. Diplococci
- c. Streptococci
- d. Both A and C

42. Single circuit heart is present in

- a. Fish
- b. Amphibians
- c. Birds
- d. Reptiles

43. Which of the following factors is responsible for bleeding in plants?

- a. Root pressure
- b. Hydrostatic pressure
- c. Cohesion-tension forces
- d. Both A and B

44. The attachment of the two subunits of ribosomes is controlled by

- a. Hydrogen bonding
- b. Ionic bonding
- c.  $Mg^{2+}$  ions
- d.  $Fe^{2+}$  ions

45. Which of the following is an example of divergent evolution?

- a. Limbs of man and horse
- b. Wings of bat and birds
- c. Fins of shark and seahorse
- d. All of the above

46. Similarity in characteristics resulting from common ancestors is known as

- a. Cognatology
- b. Correspondology
- c. Homology
- d. Heterology



47. The most abundant protein on the earth is
- Ribulose biphosphate
  - Ribulose biphosphate carboxylase
  - Ribulose phosphate
  - All of the above
48. Which of the following is not a congenital disorder?
- Hemophilia
  - Down's syndrome
  - Turner's syndrome
  - Cretinism
49. Which of the following is true about DNA polymerase III?
- It is a monomer acting on both strands of DNA.
  - It is a monomer acting on one strand of DNA.
  - It is a dimer acting on both strands of DNA.
  - It is a dimer acting on one strand of DNA.
50. Plant biomass is equal to
- Gross primary production
  - Net primary production
  - Gross food production
  - Net food production
51. Studies have revealed that the nitrogenous compounds present in honey dew are
- 1%
  - 10-25%
  - 50%
  - 90%
52. Fats have a specific gravity of
- 0.9
  - 0.5
  - 0.8
  - 1.1
53. \_\_\_\_\_ plays role in the selection of genes.
- Nucleus
  - Cytoplasm
  - Mitochondrial matrix
  - Both A and B
54. Which of the following has streamline body?
- Reptiles
  - Fish
  - Birds
  - Both B and C
55. Which of the following is correct about foot bones?
- 8 tarsals, 5 metatarsals, 14 phalanges
  - 8 tarsals, 5 metatarsals, 15 phalanges
  - 7 tarsals, 5 metatarsals, 14 phalanges
  - 7 tarsals, 5 metatarsals, 15 phalanges
56. Factor that affects the type of life in an aquatic ecosystem is
- Energy
  - Nutrients
  - Amount of water
  - Both A and B
57. The resolving power of human eye is
- 1.0 mm
  - 2.0 mm
  - 2.0  $\mu$ m
  - 1.0  $\mu$ m
58. SRY gene is present at
- The tip of short arm of Y chromosome
  - The mid of short arm of Y chromosome
  - The tip of long arm of Y chromosome
  - The mid of long arm of Y chromosome
59. Which of the following resembles the collar cells in sponges?
- Choanoflagellates
  - Ciliates
  - Dinoflagellates
  - Apicomplexans
60. Hyphomicrobium is an example of
- Cocci
  - Bacilli
  - Trichome forming
  - Spirilla
61. Internal fertilization occurs in
- Oviparous
  - Viviparous
  - Ovoviviparous
  - All of these

62. The shape of acrocentric chromosomes during anaphase is
- k
  - i
  - j
  - v
63. Sponges are mostly protandrous, which means
- Male sex develops first
  - None of the above
  - Female sex develops first
  - Both sexes develop simultaneously
64. Synecology refers to the relationship between
- Single population and environment
  - Many populations and environment
  - Species and environment
  - None of the above
65. The incidence of \_\_\_\_\_ type of kidney stones is the most common.
- Uric acid
  - Calcium sulphate
  - Calcium phosphate
  - Calcium oxalate
66. All of the following statements are true about independent assortment except
- Alleles assort independently into gametes.
  - Independent assortment of alleles depends on independent assortment of their chromosomes.
  - Genes of homologous chromosomes assort independently.
  - Ratio of each joint phenotypic combination can be obtained by product rule.
67. For each trait, there is \_\_\_\_\_ number of elements.
- 1
  - 2
  - 3
  - 4
68. The term Annelida comes from the Latin word for
- Little ring
  - Segmented body
  - Pointed ends
  - Flatworms
69. Coenzymes are made up of
- Polypeptides
  - Proteins
  - Vitamins
  - Carbohydrates
70. Marine algae are a source of many useful products. These include all of the following except
- Algin
  - Agar
  - Pectin
  - Carrageenan
71. In humans, baroreceptors (blood pressure receptors) are present in
- Left ventricle
  - Carotid artery
  - Hypothalamus
  - Branchial vessels
72. Dandruff in hair is caused by
- Bacteria
  - Lice
  - Virus
  - Fungi
73. In fetus, RBCs are synthesized in
- Liver
  - Bone marrow of sternum
  - Bone marrow of femur
  - Bone marrow of humerus
74. When abdomen of cockroach contracts,
- The first four pairs of spiracles open
  - The posterior six pairs of spiracles open
  - The anterior four pairs of spiracles close
  - Both b & c
75. Termination of transfer RNA occurs at \_\_\_\_\_ site.
- A site
  - P site
  - E site
  - None of the above
76. Which of the following sexual spores are formed not inside of their respective reproductive structures?
- Zygospores
  - Ascospores
  - Basidiospore
  - All of the above

77. Most of the  $H_2O$  is used in
- Industry
  - Irrigation
  - Household
  - Drinking
78. Overdominance is characterized by
- One allele is dominant, other is recessive
  - Homozygotes exceed in expression as compared to heterozygotes
  - Heterozygotes exceed in expression as compared to homozygotes
  - Rh blood group type is its example
79. In animals living in desert, \_\_\_\_\_ nephrons are more important.
- Cortical
  - Juxtamedullary
  - Medullary
  - Hilar
80. The bite of rabid dogs, cats and other animals causes which of the following diseases in humans?
- Hydrophobia
  - Anthrax
  - Fowl cholera
  - Tuberculosis
81. Which of the following type of asexual reproduction does not occur in plants?
- Budding
  - Grafting
  - Fission
  - Layering
82. In isobilateral leaves, the stomata are present in
- Only upper epidermis
  - Only lower epidermis
  - Both in upper and lower epidermis
  - None of the epidermis
83. Interphase of meiosis lacks
- $G_1$
  - S
  - $G_2$
  - None of the above
84. The phylum of animals in which there is no body cavity is/are
- Aschelminthes
  - Chordates
  - Platyhelminthes
  - Annelids
85. In semi-conservative replication, which of the following is true regarding the separation of two strands?
- Primary structure is conserved, and secondary structure is disrupted.
  - Secondary structure is conserved, primary structure is disrupted.
  - Both the primary and secondary structure are conserved.
  - Both the primary and secondary structure are disrupted.
86. Physalia (Portuguese man of war) has up to \_\_\_\_\_ different types of zooids.
- Three
  - Six
  - Four
  - Five
87. Physarum is a
- Plant-like protist
  - Animal-like protist
  - Fungi-like protist
  - none of the above
88. How many types of amino acids are present in cells?
- 180
  - 20
  - 170
  - 25
89. Which of the following organelle was first isolated from liver cells?
- Lysosomes
  - Peroxisomes
  - Glyoxysomes
  - Ribosomes
90. The closed circle chromosome of *Escherichia coli* measures
- 18,000  $\mu m$
  - 16,000  $\mu m$
  - 14,000  $\mu m$
  - 12,000  $\mu m$

91. The characteristics of the hyphae of Zygomycota are
- Septate and mononucleate
  - Septate and di nucleate
  - Non-septate and multi nucleate
  - Non-septate and mononucleate

92. *Saccharomyces cerevisiae* reproduces by
- Conidia
  - Spores
  - Fragmentation
  - Budding

93. The enzyme catalase works best at pH
- 6.80
  - 9.00
  - 9.70
  - 7.60

94. Which of the following is not associated with growth?
- Permanent
  - Irreversible
  - Increase in size
  - None of the above

95. Blastomeres are formed in
- Morula
  - Blastula
  - Gastrula
  - Neurula

96. Oxyhemoglobin releases up oxygen at
- Tissue level
  - Organelle level
  - Organ level
  - Cellular level

97. Nematocysts are stinging cells present in
- Planaria
  - Hydra
  - Cockroach
  - Amoeba

98. Which of the following statement about enzymes is false?
- They accelerate the chemical reactions.
  - They are sensitive to change in pH.
  - Some enzymes need co-factors for proper functioning.
  - They are all fibrous proteins.

99. If enzyme concentration is kept constant and amount of product is increased, a point is reached when a further increase in the substrate does not increase the rate of reaction. This is because
- Active sites are blocked
  - Substrate concentration is inversely proportional to enzyme action
  - Active sites are occupied, and enzymes become saturated
  - Enzymes are denatured

100. \_\_\_\_\_ hormone is not synthesized in the anterior lobe of pituitary gland.
- MSH
  - TSH
  - ADH
  - None of the above



# ANSWERS & EXPLANATIONS

Question Number	1.	Correct Option	d
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## Explanation

Meiosis follows nuclear fusion inside the ascus, commonly 8 ascospores are produced inside each ascus.

Question Number	2.	Correct Option	b
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## Explanation

In nematodes, the sense organs are in the form of sensory papillae present on the lips at the anterior end.

Question Number	3.	Correct Option	d
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## Explanation

There are two main factors responsible for bleeding, the hydrostatic pressure in xylem and phloem, and the root pressure which is exerted by xylem cells.

Question Number	4.	Correct Option	a
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## Explanation

In a biome, we can study the kinds of animals, plants and other organisms. Whereas, zoogeography involves the study of hereditary and distribution of only animals in nature.

Question Number	5.	Correct Option	a
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## Explanation

Oral and vaginal thrush are caused by the fungus *Candida albicans*.

Question Number	6.	Correct Option	d
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## Explanation

During gene sequencing, DNA strands are cut into pieces, they are marked with fluorescent dye and new strands of different sizes are synthesized.

Question Number	7.	Correct Option	
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## Explanation

Although it is not doubled in meiosis II, but the chromosomal material is doubled before meiosis I that results in the four haploid daughter cells.

Question Number	8.	Correct Option	
-----------------	----	----------------	--

## Explanation

Lifespan of RBC's is four months.

Question Number	9.	Correct Option	
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## Explanation

Muscle fatigue results in accumulation of lactic acid and an imbalance also contribute to muscle fatigue. Lactic acid lowers muscle pH to drop.

Question Number	10.	Correct Option	
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## Explanation

The family poaceae has an indehiscent fruit in which fruit (pericarp) is completed and fused with seed coat. Such a fruit is termed as caryopsis.

Question Number	11.	Correct Option	
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## Explanation

When an oxygen pressure is 115mm mercury, hemoglobin is saturated, and therefore contains 19.6ml of oxygen per 100ml of blood.

Question Number	12.	Correct Option	
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## Explanation

The construction of a genetic map and a base sequence map are both the aims of human genome project. Gene sequencing is not an aim of this project.

13. Correct Option a

Question Number

**Explanation**  
Lateral meristems are cylinders of dividing cells. They are present in dicots and gymnosperms but not in monocot plants.

14. Correct Option a

Question Number

**Explanation**  
Sun is the main driving force behind every process that occurs in nature.

15. Correct Option d

Question Number

**Explanation**  
Rhodophyta or red algae do not have any flagella, hence do not exhibit locomotion.

16. Correct Option b

Question Number

**Explanation**  
Silicon carbide needles make tiny holes in the eggs through which DNA can enter that is why they are used to produce transgenic animals.

17. Correct Option b

Question Number

**Explanation**  
Permellia and Dermatocarpon are the common examples of foliose lichen stage.

18. Correct Option d

Question Number

**Explanation**  
If a carrier mother marries a normal individual, the offspring will have an infected male, a carrier female and a normal male and a female. Hence, the ratio comes out to be 1: 1: 2.

19. Correct Option b

Question Number

**Explanation**

The cavity between yolk and endoderm is primitive gut or gastrocoel. It is formed when the mesodermal cells migrate medially and caudally from both sides and create a midline thickening.

20. Correct Option a

Question Number

**Explanation**

In littoral zone, plant communities are most diverse including water lilies and entirely submerged vascular plants and algae. The greatest diversity of animals in the lake is also found in this zone. Littoral invertebrates include crustaceans, insect larvae, snails, flatworms, hydra; vertebrates include frogs, aquatic snakes and turtles.

21. Correct Option a

Question Number

**Explanation**

Liver is also a storehouse of various chemicals, these include iron and glycogen.

22. Correct Option a

Question Number

**Explanation**

Fungi can tolerate the temperature extremes of -5 degrees Celsius below freezing to 50 degrees Celsius and above. That is why they can grow on things kept in refrigerator.

23. Correct Option c

Question Number

**Explanation**

Akinetes are thick walled, enlarged vegetative cells which accumulate food and become resting spores.

24. Correct Option

Question Number

**Explanation**

Bacteriophages are viruses that infect bacteria. They were independently discovered by Twort in 1915 and D'Herelle in 1917

Question Number	25.	Correct Option	d
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**Explanation**

The morphogenetic determinants that are responsible for cell differentiation are present in the different cytoplasmic components of blastomeres.

Question Number	26.	Correct Option	b
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**Explanation**

A weed called mouse eared cress has been genetically engineered to produce biodegradable plastic (polyhydroxybutyrate) in cell granules.

Question Number	27.	Correct Option	d
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**Explanation**

Bilirubin is a metabolic waste, which is an end product of hemoglobin breakdown and metabolites of various hormones.

Question Number	28.	Correct Option	d
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**Explanation**

Toadstools are poisonous mushrooms, such as death cap and jack-O' lantern mushroom.

Question Number	29.	Correct Option	d
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**Explanation**

In lithotripsy, high concentrations of X-rays or ultrasound are directed from a machine outside the body to break the stone inside into tiny pieces that are passed out in urine.

Question Number	30.	Correct Option	b
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**Explanation**

The nucleus of the egg cell is destroyed by ultraviolet radiations and a new nucleus from somatic cell is introduced into the egg cell for cloning.

Question Number	31.	Correct Option	a
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**Explanation**

Electric shock makes self-sealing holes in plasma membrane through which genetic material can enter the cell, this helps in making these plants transgenic.

Question Number	32.	Correct Option	b
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**Explanation**

The cytoplasmic flow throughout the hyphae is responsible for their rapid growth and spread.

Question Number	33.	Correct Option	b
-----------------	-----	----------------	---

**Explanation**

A horse is a hoofed grazing animal and falls under the category ungulates.

Question Number	34.	Correct Option	d
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**Explanation**

An energy pyramid represents energy at each trophic level in the form of kilocalories of sunlight per meter square per year.

Question Number	35.	Correct Option	c
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**Explanation**

Eukaryotic ribosomes are composed of an almost equal amounts of RNA and proteins; hence they are ribo-nucleo particles.

Question Number	36.	Correct Option	d
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**Explanation**

Aspergillus is used for producing soya sauce and soya paste from soya bean. Citric acid is also obtained from Aspergillus.

Question Number 37. Correct Option b

**Explanation**  
Xanthophylls are accessory photosynthetic pigments that absorb yellow to orange light.

Question Number 38. Correct Option c

**Explanation**  
Testosterone is produced by interstitial cells present between interstitial cells. This hormone is essential for the successful production of sperms and the development of male secondary sexual characteristics during puberty.

Question Number 39. Correct Option c

**Explanation**  
The hydrogen produced by splitting of water reduces NADP to NADPH<sub>2</sub> during phosphorylation.

Question Number 40. Correct Option b

**Explanation**  
Grasslands with non-woody plants are called prairies. Prairies are present in temperate climates, such as Prairies of North America, Pampas of Argentina.

Question Number 41. Correct Option d

**Explanation**  
Cocci have distinct arrangements based on the plane of divisions. If the division is in one plane, it gives rise to diplococci and streptococci.

Question Number 42. Correct Option a

**Explanation**  
Single circuit heart is present in fish, because blood travels in one direction only.

Question Number 43. Correct Option d

**Explanation**  
There are two main factors responsible for bleeding, the hydrostatic pressure in xylem and phloem, and the root pressure which is exerted by xylem cells.

Question Number 44. Correct Option c

**Explanation**  
The larger subunit of ribosome of 60S and smaller subunit of 40S attach to form an 80S particle. This attachment is controlled by the presence of Mg<sup>2+</sup> ions.

Question Number 45. Correct Option a

**Explanation**  
Limbs of man and horse are functionally alike but structurally different, hence they are examples of divergent evolution. However, the others are examples of convergent evolution.

Question Number 46. Correct Option c

**Explanation**  
The similarity in characteristics resulting from common ancestry is known as homology, and such anatomical signs of evolution are called homologous structures.

Question Number 47. Correct Option b

**Explanation**  
Ribulose biphosphate carboxylase (Rubisco) is the most abundant protein on Earth.

Question Number 48. Correct Option d

**Explanation**  
Cretinism is a metabolic or hormonal disorder. However, hemophilia, down's syndrome and turner's syndrome are all congenital disorders.



Question Number	49.	Correct Option	d
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**Explanation**

DNA polymerase III is a dimer that acts on one strand of DNA. Whereas DNA polymerase I is a small enzyme that plays a supporting role in DNA replication.

Question Number	50.	Correct Option	b
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**Explanation**

The amount of energy left after plants have met their respiratory needs is net primary production, which shows up as plant biomass.

Question Number	51.	Correct Option	a
-----------------	-----	----------------	---

**Explanation**

The composition of honey dew revealed that it contains about 1% of nitrogenous compounds.

Question Number	52.	Correct Option	c
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**Explanation**

Fats and oils are lighter than water and have a specific gravity of 0.8. Hence, they float over the surface of water.

Question Number	53.	Correct Option	b
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**Explanation**

Cytoplasm plays the role of selectin of genes as it contains different morphogenetic components.

Question Number	54.	Correct Option	d
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**Explanation**

Fish and birds have streamline body to cut through water and air respectively. Such type of body shape gives great speed to fish and birds while swimming and flying.

Question Number	55.	Correct Option	c
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**Explanation**

Each foot contains 26 bones. These include 7 tarsals; 5 metatarsals form the framework of palm of foot and 14 phalanges are attached to the metatarsals.

Question Number	56.	Correct Option	d
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**Explanation**

The main factors that determine the quantity and type of life in an aquatic ecosystem are energy and nutrients.

Question Number	57.	Correct Option	a
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**Explanation**

The human eye can differentiate between two points which are at least 1.0 mm apart. This is called the resolving power of human eye.

Question Number	58.	Correct Option	a
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**Explanation**

SRY, the maleness determining gene is present at the tip of short arm of Y chromosome.

Question Number	59.	Correct Option	a
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**Explanation**

Choanoflagellates have striking resemblance to collar cells in sponges.

Question Number	60.	Correct Option	d
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**Explanation**

Hyphomicrobium is an example of spiral shaped bacteria.

Question Number	61.	Correct Option	d
<b>Explanation</b> All of these are types of terrestrial animals, and internal fertilization occurs in terrestrial animals. It does not occur in aquatic environment.			

Question Number	62.	Correct Option	b
<b>Explanation</b> Location of centromere is near the tip of chromosome which forms i shape during anaphase.			

Question Number	63.	Correct Option	a
<b>Explanation</b> The sponges are mostly protandrous, i.e. male sex cells develop first.			

Question Number	64.	Correct Option	b
<b>Explanation</b> The study of the relationship of different communities (grouping of populations) to their environment is called synecology or community ecology.			

Question Number	65.	Correct Option	d
<b>Explanation</b> Calcium oxalate type stones are 70% of total kidney stones. Whereas, the incidence of stones of calcium phosphate and of uric acid is 15% and 10% respectively.			

Question Number	66.	Correct Option	c
<b>Explanation</b> Genes of homologous chromosomes cannot assort independently because they are present on same chromosome.			

Question Number	67.	Correct Option	b
<b>Explanation</b> Each trait has a pair of these particulate hereditary factors; one from male and the other from female parent.			

Question Number	68.	Correct Option	a
<b>Explanation</b> Annelids are derived from the Latin word for "little ring".			

Question Number	69.	Correct Option	c
<b>Explanation</b> Vitamins are the raw materials from which coenzymes are made.			

Question Number	70.	Correct Option	c
<b>Explanation</b> Agar, algin and carrageenan are the products of marine algae, but pectin is not.			

Question Number	71.	Correct Option	b
<b>Explanation</b> Baroreceptors are present in carotid and aortic arteries of tetrapods. They play important roles in the regulation of blood pressure.			

Question Number	72.	Correct Option	d
<b>Explanation</b> Fungi causes dandruff in hair. It is an example of parasitism where the fungi behave as parasite and human hair act as host.			

Question  
Number

73.

Correct  
Option

a

**Explanation**

In fetus, red blood cells are synthesized in liver and spleen, however in children and adults, they are synthesized in bone marrow.

Question  
Number

74.

Correct  
Option

**Explanation**

When the abdomen contracts, the anterior four pairs of spiracles close and the posterior six pairs open. This forces air through the tubes and eventually out of the body.

Question  
Number

75.

Correct  
Option

b

**Explanation**

Termination of transfer RNA occurs at the P site and it is ejected from E site.

Question  
Number

76.

Correct  
Option

c

**Explanation**

The haploid sexual spores, basidiospores are born on, not inside, each basidium.

Question  
Number

77.

Correct  
Option

b

**Explanation**

Most of the water is used for irrigational purposes. About 90% of water is used in irrigation. The rest 10% is used in domestic as well as industrial purposes.

Question  
Number

78.

Correct  
Option

c

**Explanation**

Overdominance is characterized by the heterozygotes that exceed in quantity the phenotypic expression as compared to homozygotes.

Question  
Number

79.

Correct  
Option

b

**Explanation**

Juxtamedullary nephrons produce concentrated urine. That is why they are important for animals living in desert, so that water is not wasted via excretion in such a dry environment.

Question  
Number

80.

Correct  
Option

a

**Explanation**

The bite of rabid dog, cat and other animals causes rabies. The other name for rabies is hydrophobia.

Question  
Number

81.

Correct  
Option

c

**Explanation**

Budding, grafting and layering are the types of asexual reproduction in plants. However, binary fission is seen only in unicellular organisms.

Question  
Number

82.

Correct  
Option

c

**Explanation**

In isobilateral leaves, the stomata are present in both upper and lower epidermis e.g. lily and maize leaf.

Question  
Number

83.

Correct  
Option

c

**Explanation**

The interphase of meiosis lacks G<sub>2</sub> phase.

Question  
Number

84.

Correct  
Option

c

**Explanation**

In phylum platyhelminthes, there is no body cavity or coelom, hence are called acoelomates. Aschelminthes are pseudocoelomates and Annelids and Chordates are coelomates.

Question Number	85.	Correct Option	a
<b>Explanation</b> In semi-conservative replication, the original molecule is unzipped, each strand of the duplex becomes a part of another duplex. During the separation of two strands of DNA, the primary structure is conserved while the secondary structure is disrupted.			

Question Number	86.	Correct Option	d
<b>Explanation</b> Physalia (Portuguese man of war) has up to five different types of zooids, performing different functions for the colony.			

Question Number	87.	Correct Option	c
<b>Explanation</b> Physarum, a slime mold is a fungi-like protist.			

Question Number	88.	Correct Option	c
<b>Explanation</b> About 170 types of amino acids have been found to occur in cells. Of these, about 25 are constituents of proteins. Most of the proteins are however made of 20 types of amino acids.			

Question Number	89.	Correct Option	b
<b>Explanation</b> De Duve and coworkers first isolated peroxisomes from liver cells in 1965.			

Question Number	90.	Correct Option	c
<b>Explanation</b> The closed circle chromosome of Escherichia coli measures approximately 14,000 nm.			

Question Number	91.	Correct Option	c
<b>Explanation</b> The hyphae of Zygomycota are non-septate and multi nucleate			

Question Number	92.	Correct Option	d
<b>Explanation</b> Saccharomyces cerevisiae is a yeast and yeasts reproduce asexually by budding.			

Question Number	93.	Correct Option	d
<b>Explanation</b> The enzyme catalase has an optimum pH of 7.60. Hence, it works best at this pH.			

Question Number	94.	Correct Option	d
<b>Explanation</b> Growth is permanent and irreversible increase in size that occurs as an organism matures.			

Question Number	95.	Correct Option	a
<b>Explanation</b> Cleavage results in the formation of a rounded closely packed mass of blastomeres, this is morula. It consists of a disc shaped mass of cells two or more layers in thickness lying close to yolk.			

Question Number	96.	Correct Option	a
<b>Explanation</b> Oxyhemoglobin releases up oxygen at tissue level.			

Question Number	97.	Correct Option	b
<b>Explanation</b> In the digestive system of hydra, embedded in the tentacles are numerous stinging cells called nematocysts.			



Question Number	98.	Correct Option	d
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**Explanation**

Enzymes are three dimensional globular proteins that have specific chemical composition due to their component amino acids and a specific shape.

Question Number	99.	Correct Option	c
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**Explanation**

If the enzyme concentration is kept constant, a time is reached when further increase in substrate concentration does not increase the rate of reaction because all the active sites of enzymes are occupied. Enzymes become saturated.

Question Number	100.	Correct Option	c
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**Explanation**

Oxytocin and ADH are synthesized by posterior lobe of pituitary gland while MSH and TSH are synthesized by the anterior lobe of pituitary gland.