# BIOLOGY

# (Solved Paper of CEE)

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**(AMTRON)**
(A Government of Assam Undertaking)

1. Floridean starch is found in

[A] Chlorophyceae

[B] Rhodophyceae

[C] Phaeophyceae

[D] Cyanophyceae

Answer [B]

**Hints:**

Floridean starch is the characteristic photosynthetic reserve substance of the red algae, Rhodophyceae.

2. The 'eyes' of the potato tuber are

[A]root buds

[B]flower buds

[C]shot buds

[D]axillary buds

Answer [D]

**Hints:**

Axillary buds is the 'eyes' of the potato tuber. Presence of 'eyes' in an adaption for asexual propagation.

3. The organelles which take part in photorespiration are

[A]chloroplast, mitochondria, nucleus

[B]chloroplast, mitochondria, lysosomes

[C]mitochondria, chloroplast, peroxisome

[D]mitochondria, lysosomes, peroxisome

Answer [C]

**Hints:**

The reactions of photorespiration occur in three different compartments in higher plants: the choroplast, the peroxisome and the mitochondrion. The reactions begin in the chloroplast with the oxygenation of ribulose bisphosphate.

4. Which one of the following elements is required in the germination of pollen grains?

[A]Chlorine

[B]Potassium

[C]Boron

[D]Calcium

Answer [C]

**Hints:**

The most important microutrient essential of germination of polen grains and growth of pollen tubes is Boron. It is uptake by pants in the form of $H_3BO_3$ through leaves.

5. Which one of the following ecosystems has highest rate of gross primary production?

[A]Grasslands

[B]Mangroves

[C]Coral reefs

[D]Equatorial rain forest

Answer [D]

**Hints:**

Equatorial rain forests are the ecosystem with highest rate of GPP. This region receives increased annual rainfall greater than 140cm.

6. Which one of the following acids is a derivative of carotenoids?

[A]Indole-3-acetic acid

[B]Gibberellic acid

[C]Abscisic acid

[D]Indole butyric acid

Answer [C]

**Hints:**

Abscisic acid is a derivative of carotenoids.

7. Use of transgenic plants as biological factories for the production of special chemicals is called

[A]molecular farming

[B]molecular genetics

[C]molecular mapping

[D]dry farming

Answer [A]

**Hints:**

Genetically modified plants are used by molecular farming to produce large quantities of recombined pharmaceutical and industrial substance.

8. Coconut water (coconut milk) is widely used in tissue culture because it contains

[A] auxin

[B]ethylene

[C]cytokinin

[D] gibberellin

Answer [C]

**Hints:**

Coconut water (coconut milk) is rich source of carbohydrate and other nutrients including a plant horone cytokinin which rapid cell division in plants.

9. In Down's syndrome of a male child, the sex chromosome complement is

[A]XO

[B]45XY

[C]45XX

[D]44XXY

Answer [B]

**Hints:**

Patients with Down’s syndrome have 47 chromosomes(45+ XX in females and 45+ XY in males).

10. During anaerobic digestion of organic waste, such as in producing biogas, which one of the following is left undergraded?

[A]Lipid

[B]Lignin

[C]Hemicellulose

[D]Cellulose

Answer [A]

11. Identify the correctly matched pair:

[A]Basel Convention-Biodiversity conservation

[B]Kyoto Protocol-Climatic change

[C]Montreal Protocol-Global warming

[D]Ramsar Convention-Groundwater pollution

Answer [B]

12. Breeding of crops with high levels of minerals, vitamins and proteins is called

[A]somatic hybridization

[B]biofortification

[C]biomagnification

[D]micropropagation

Answer [B]

**Hints:**

The process of breeding crops to increase their nutritional quality through biological is called biofortification.

13. 'Comma'-shaped bacteria are known as

[A]coccus

[B]spiral

[C]spirillum

[D]vibrio

Answer [D]

14. ABO blood group system is controlled by

[A]multifactor inheritance

[B]incomplete dominance

[C]multiple allelism

[D]epistasis

Answer [C]

**Hints:**

Multiple  allelism is an example of inheritance of ABO blood groups in man.

15. Taxon is

[A]a group of related families

[B]a group of related species

[C]a type of living organism

[D]a taxonomic group of any ranking

Answer [D]

**Hints:**

The science of biological classification or taxonomy to denote a taxonomic category is taxon.

16. Keystone species in an ecosystem are

[A]present in maximum number

[B]that which are most frequent

[C]attaining a large biomass

[D]contributing to ecosystem properties

Answer [D]

**Hints:**

A keystone species help to maintain local biodiversity within a community.

17. The 'triticale' is an intergeneric hybrid between which two of the following?

[A]Wheat and maize

[B]Maize and rye

[C]Wheat and rye

[D]Bajra and wheat

Answer [C]

**Hints:**

Triticale is an intergeneric hybrid between wheat and rye.

18. Hydrophonic is

[A]nutrientless culture

[B]waterless culture

[C]soilless culture

[D]None of the above

Answer [C]

**Hints:**

Hydroponics is method of growing  plants using mineral nutrient solutions ,in water, without soil

19. Biodiversity Act of India was passed by the Parliament in the year

[A] 1992

[B]1996

[C]2000

[D]2002

Answer [D]

**Hints:**

Biological Diversity Act of India was passed by the parliament of India for preservation of biodiversity in 2002.

20. 'Inland fishery' refers to

[A]culturing of fish in freshwater

[B]trapping and capturing fishes form sea coast

[C]deep-sea fishing

[D]extraction of oil from fishes

Answer [A]

21. 'Pacemaker' of heart is

[A]AV node

[B]bundle of His

[C]SA node

[D]Purkinje fibres

Answer [C]

**Hints:**

Electrical impulse at regular intervals is generated by SA node to cause the heart of beat with rhythm of about 60 to 70 beats per minute.

22. Which one of the following is both exocrine and endocrine glands?

[A]Liver

[B]Pancreas

[C]Thyroid

[D]Adrenal

Answer [B]

**Hints:**

Pancreas's exocrine part secretes a digestive juice called pancreatic juice while its endocrine part secretes hormones like insulin and glucagon.

23. The endosperm of gymnosperm is

[A]triploid

[B]haploid

[C]diploid

[D]polyploid

Answer [B]

**Hints:**

Endosperm of gymnosperm is haploid.

24. Nucleotide arrangement in DNA can be seen by

[A]X-ray crystallography

[B]electron microscope

[C]ultracentrifuge

[D]light microscope

Answer [A]

25. The area where wild populations, traditional life styles and genetic resources are protected is

[A]core zone

[B]buffer zone

[C]biosphere reserve

[D]manipulation zone

Answer [C]

26. A person which shows the secondary sexual characters of both male and female is called

[A]intersex

[B]hermaphrodite

[C]bisexual

[D] gynandromorph

Answer [D]

**Hints:**

Individuals with a mosaic of male and female sexual characteristic are called Gynandromorphs.

27. Which one of the following substances would cause coagulation of blood at the site of its introduction?

[A]Prothrombin

[B]Fibrinogen

[C]Thromboplastin

[D]Heparin

Answer [C]

**Hints:**

Thromboplastin is a plasma protein aiding blood coagulation through catalyzing the conversion of prothrombin to thrombin.

28. People recovering from long illness are often advised to include the alga Spirulina in their diet because it

[A]makes the food easy to digest

[B]is rich in proteins

[C]has antibiotic properties

[D]restores the intestinal microflora

Answer [B]

**Hints:**

Spirulina is rich in dietary protein, vitamins, minerals that can help protect cell from damage.

29. A population of genetically indentical individuals, obtained from sexual reproduction is

[A]callus

[B]clone

[C]deme

[D]aggregate

Answer [B]

30. The longest cells in human body are

[A]nerve cells

[B]bone cells

[C]leg muscle cells

[D]heart muscle cells

Answer [A]

**Hints:**

Neurons or nerve cells are the longest cells in human body

31. 'Rennin' used in cheese industry is

[A]antibiotic

[B]enzyme

[C]alkaloid

[D]inhibitor

Answer [B]

**Hints:**

Rennin is a proteolytic enzyme used in cheese industry as an industrial catalyst to make cheese**.**

32. Antibodies in our body are complex

[A]steriods

[B]prostaglandins

[C]glycoproteins

[D]lipoproteins

Answer [C]

**Hints:**

Antibodies is used by the immune system to idenify  an neutralize antigens.

33. Clove is

[A]flower bud

[B]axillary bud

[C]thalamus

[D]ovule

Answer [A]

**Hints:**

Cloves are the aromatic flower buds of tree Syzygium aromaticum.

34. Diversity of habitat over the total landscape is called

[A]beta-diversity

[B]gamma-diversity

[C]landscape diversity

[D]ecosystem diversity

Answer [B]

**Hints:**

Gamma diversity refers to total biodiversity over a large area or region.

35. The life span of human RBCs is

[A]120 days

[B]20 days

[C]9 days

[D]90 days

Answer [A]

36. If an angiospermic male plant is diploid and female plant tetraploid, then the ploidy level of endosperm will be

[A]haploid

[B]triploid

[C]tetraploid

[D]pentaploid

Answer [D]

**Hints:**

Fusion of tetraploid central cell to the haploid (n) male gamete forms a pentaploid(5n) endosperm.

37. The common bottle cork is a product of

[A]dernatogen

[B]phellogen

[C]xylem

[D]vascular cambium

Answer [B]

**Hints:**

The common bottle cork is a product of phellogen. It is composed of dead cell that accumulate on the outer surface of the cork oak tree.

38. The most abundant mineral in human body is

[A]magnesium

[B]sodium

[C]calcium

[D]potassium

Answer [C]

**Hints:**

Calcium is the most abundant mineral in body.

39. 'Himgiri' developed by hybridization and selection of disease resistance against rust pathogens is a variety of

[A]chilli

[B]maize

[C]sugarcane

[D]wheat

Answer [D]

40. Fruits that develop from inflorescence are called

[A]single fruits

[B]multiple fruits

[C]aggregate fruits

[D]parthenocarpic fruits

Answer [B]

**Hints:**

Fruits developed from inflorescence are called composite fruits or multiple fruits.

41. Lateral roots come out of

[A]endodermis

[B]pericycle

[C]cortex

[D]hypodermis

Answer [B]

**Hints:**

Lateral roots arise from the mature pericycle of the parnet root.

42. Premature leaf fall is caused due to the deficiency of

[A]calcium

[B]nitrogen

[C]potassium

[D]phosphorus

Answer [D]

43. First stable product in C4 plants is

[A]PGA

[B]RuDP

[C]PGA1d

[D]OAA

Answer [D]

**Hints:**

In C plants, oxalo-acetic acid (OAA)-a 4C compound is the first stable product.

44. Kranz anatomy is found in

[A]C2 plants

[B]C3 plants

[C]C4 plants

[D]CAM plants

Answer [C]

**Hints:**

Kranz anatomy refers to an arrangement of bundle sheath cells surrounded by mesophyll cells in C4 plants.

45. Monotropa is

[A]fungal parasite

[B]angiospermic saprophyte

[C]stem parasite

[D]symbiont

Answer [A]

**Hints:**

Monotropa is a fungal parasite; they are mycoheterotrophs getting their foods through parasitism upon fungi.

46. Genetic dwarfness can be overcome by treatment with

[A]auxin

[B]gibberellin

[C]antigibberellin

[D]ethylene

Answer [B]

47. Hormone present in greatest concentration during ovulation is

[A]FSH

[B]LH

[C]prolactin

[D]ACTH

Answer [B]

48. Internal ear develops from

[A]ectoderm

[B]endoderm

[C]mesoderm

[D]None of the above

Answer [A]

49. Polytene chromosome was reported first by

[A]Balbiani(1881)

[B]Fleming(1882)

[C]Ruckert(1882)

[D]Morgan(1910)

Answer [A]

**Hints:**

polytene chromosomes was first reported by Balbiani.

50. How much oxygen can be carried by one molecule of haemoglobin?

[A]1

[B]2

[C]3

[D]4

Answer [D]

**Hints:**

Hemoglobin is the iron-containing oxygen-transport metalloprotein in the RBCs of blood of vertebrates. A heme group consists if an iron ion. Since each iron atom can bind to one oxygen molecule, a hemoglobin molecule can bind and carry four different oxygen atoms at a time.

51. Who did provide the first model of *lac* operation?

[A]Watson and Crick

[B]Jacob and Monod

[C]Emil Fischer [

D]Khosland

Answer [B]

**Hints:**

french microbiologist Francois Jacob and Jacques Monad provided the first model of Lac operon.

52. The drug which suppresses the brian activity and relieve pain is

[A]mescaline

[B]cocaine

[C]opium

[D]caffeine

Answer [C]

**Hints:**

Opium contains varying amounts of alkaloids such as morphine, codeine, thebaine and papaverine, it develop narcosis and are analgesic.

53. The Golden langoor is a/an

[A]extinct species

[B]endangered species

[C]dominant species

[D]aggressive species

Answer [B]

**Hints:**

The golden langur is an endangered specie

54. Slime molds are

[A]photosynthetic

[B]heterotrophic

[C]saprophytic

[D]parasitic

Answer [C]

**Hints:**

Slime helps to decompose the dead vegetation, and feed on bacteria, yeasts and fungi.

55. The sea horse is a/an

[A]mammal

[B]pisces

[C]amphibian

[D]coelenterate

Answer [B]

**Hints:**

Seahorse is a group of small marine fish species.

56. The storage form of carbohydrate in animals' body is

[A] glucose

[B]starch

[C]glycogen

[D]cellulose

Answer [C]

**Hints:**

Glycogen forms the principal storage form of glucose in animal body.

57. The cause of 'insulin shock' is

[A]excess insulin injection

[B]deficiency of insulin

[C]damage to beta-cells of pancreas

[D]All of the above

Answer [A]

**Hints:**

Insulin shock occurs when the body has too much insulin, and has tendency to occur when there is unbalanced insulin in person's system.

58. Which cranial nerve controls the movement of eyeball

[A]Opthalmic nerve

[B]Optic nerve

[C]Oculomotor

[D]Trochlear

Answer [C]

59. The human eye forms the image of an object at its

[A]cornea

[B]iris

[C]pupil

[D]retina

Answer [D]

60. Photosynthesis is correctly explained by which of the following chemical reactions?

[A]$6CO_2 + 12H_2O \rightarrow C_6H_{12}O_6 + 6O_2 + 6H_2O$

[B]$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2 + 6H_2O$

[C]$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

[D]$2CO_2 + 12H_20 \rightarrow C_6H_{12}O_6 + 2CO_2$

Answer [A]

61. The main aim of 'Human Genome Project' is

[A]to develop better techniques for comparing two different human DNA samples

[B]to to remove disease causing genes from human DNA

[C] to introduce new genes into humans

[D]to identify the sequence of all the genes present in human DNA

Answer [D]

**Hints:**

The main aim of Human Genome Project(HGP) is to identify all the approximately 20,000-25,000 genes in human DNA and to identify the sequence of all genes present in human DNA.

62. What is correct about a test-tube baby?

[A]Fertilization in female's genital tract and growth in test tube

[B]Rearing of premature born baby in an incubator

[C]Fertilization outside and gestation inside mother's womb

[D]Both fertilization and development are done outside the female genital tract

Answer [C]

**Hints:**

The test tube baby is developed through the process of invirto fertilization or IVF and embryo transfer for further development.

63. Amniocentesis is a process to

[A]determine any disease of the heart

[B]determine any hereditary disease of the embryo

[C]know about the disease of the brain

[D]grow cell on the culture medium

Answer [B]

**Hints:**

Amniocentesis is a test employed to determine the sex of the foetus.

64. How many different types gamete can be formed by $F_1$ progeny, resulting from the cross between AABBCC×aabbcc?

[A]3

[B]8

[C]7

[D]64

Answer [B]

**Hints:**

The cross AABBCC × aabbcc is a trihybrid cross. So there can be $2^3$=8 different type of gametes can be formed by $F_1$ progeny.

65. ABO blood groups in humans are controlled by a gene I. It has three different alleles- $I_a$, $I_b$ and i. Since there are three different alleles, six different genotypes are possible. How many phenotypes can occur?

[A]2

[B]3

[C]1

[D]4

Answer [D]

**Hints:**

4 different phenotypes can occur- blood GROUP A, GROUP B, GROUP AB, GROUP O.

66. The haploid content of human DNA is

[A] $3.3 \times 10^9 bp$

[B] $4.6 \times 10^6 bp$

[C] $1.65 \times 10^9 bp$

[D] 48502bp

Answer [A]

67. Removal of introns and joining of exons in a definite order in a transcription unit called

[A]tailing

[B]transformation

[C]capping

[D]splicing

Answer [D]

68. The *lac* operon consists of

[A]four regulatory genes only

[B]one regulatory gene and three structural genes

[C]two regulatory genes and two structural genes

[D]three regulatory genes and three structural genes

Answer [B]

**Hints:**

*Lac* operon consists of one regulator gene and three polycistronic structural genes-z,y and a.

69. Archaeopteryx is a connecting link between

[A]reptiles and birds

[B]birds and mammals

[C]amphibians and reptiles

[D]None of the above

Answer [A]

**Hints:**

70. HIV that causes AIDS, first start destroying

[A]helper T lymphocytes

[B]B lymphocytes

[C]leucocytes

[D]thrombocytes

Answer [A]

**Hints:**

the virus attacks the lymphocytes, particularly T-helper cells which are vital for proper and efficient functioning of the immune system.

71. Polio is caused by

[A]bacteriophage

[B]virus with a single-stranded DNA

[C]virus with a single-stranded RNA

[D]virus with a double-stranded DNA

Answer [C]

**Hints:**

The cause of polio is polio virus. The genome of polio virus is a single-stranded positive-sense RNA having about 7500 nucleotides.

72. What will be the correct gene expression pathway?

[A]Gene→mRNA→transcription→translation→protein

[B]Transcription→gene→translation→mRNA→protein

[C]Gene→transcription→mRNA→translation→protein

[D]Gene→translation→mRNA→transcription→protein

Answer [C]

**Hints:**

Self explanatory.

73. The name of the drug used in cancer treatment produced by biotechnology is

[A] interferon

[B] HGH

[C]TSH

[D] insulin

Answer [A]

**Hints:**

Interferons are produced by biotechnology for medical use.

74.Which one of the following is not cokaryote?

[A]Protein

[B]Plantae

[C]Animalia

[D]Monera

Answer [D]

**Hints:**

Monera are prokaryotes that contains unicellular organism with a prokaryotic cell organization.

75. Enzymes increase the rate of biochemical reaction through

[A] lowering activation energy

[B]changing equilibrium of the reaction

[C]forming enzyme-product complex

[D]forming reactant-product complex

Answer [A]

**Hints:**

Enzymes increase the rate of reaction by lowering its activation energy.

76. Which one of the following roots is found in Momordica cochinchinensis?

[A]Moniliform root

[B]Annulated root

[C]Fasciculated root

[D]Nodulose root

Answer [A]

**Hints:**

Moniliform roots are found in Momordica cochinchinensis.

77. Which one of the following is associated with muscle contraction?

[A]$Ca^{2+}$

[B]P

[C]K

[D]Mo

Answer [A]

**Hints:**

$Ca^{2+}$ controls the contraction and relaxation property of muscle fiber.

78. Water potential of pure water is

[A]-1

[B]1

[C]1.5

[D]0

Answer [D]

**Hints:** The water potential of pure water in an open container is zero because there is no solute and the pressure in the container is zero.

79. Among the essential macroelements, how many of them are metal?

[A]2

[B]3

[C]4

[D]5

Answer [C]

**Hints:**

Ca, Mg, K are the three metals.

80. Which one of the following is the major component of ATPase enzyme?

[A]$P_0P_1$

[B]$P_{680}P_{700}$

[C]$F_0F_1$

[D]ADP + pi

Answer [C]

**Hints:**

The enzyme ATPase is composed of two regions- the $F_0$ and F1

81. Photosynthesis and respiration both require

[A]green cell

[B]cytochrome

[C]sunlight

[D]pigment

Answer [D]

82. The source of streptomycin is

[A] Streptomyces venezuelae

[B] Streptomyces aureofaciens

[C] Streptomyces griseus

[D] Streptomyces fradiae

Answer [C]

**Hints:**

It is produced by soil bacteria Streptomyces greiseus.

83. In genetic engineering, linker is

[A]long dsDNA

[B]short dsDNA

[C]long ssDNA

[D]short ssDNA

Answer [B]

**Hints:**

Linkers are short piece of double standard DNA of known nucleotide sequence.

84.Which one of the following is structural polysaaccharide?

[A]Glycogen

[B]Cellulose

[C]Starch

[D]Inulin

Answer [B]

**Hints:**

Cellulose is a polysaccharide formed by several hundreds to many thousands of D-glucose units.

85. Active site enzyme is formed by

[A]primary structure of protein

[B]secondary structure of protein

[C]tertiary structure of protein

[D]quaternary structure of protein

Answer [C]

**Hints:**

It is formed by tertiary structure of amino acids.

86. Through which process, unsaturated fats are made saturated?

[A]Hydrogenation

[B]Hybridization

[C]Dehydrogenation

[D]Polymerization

Answer [A]

**Hints:**

Hydrogenation of unsaturated fats produces saturated fats.

87. Iron is an important component of a balanced diet because it is needed mainly by

[A]the brain

[B]the blood

[C]the bone

[D]the nerves

Answer [B]

**Hints:**

Iron help in preparation of Hemoglobin present in RBCs of the blood.

88. Which one of the following is not found in dialyzing fluid of artificial kidney?

[A]$Na^{+}$

[B]Urea

[C]$K^{+}$

[D]$HCO^{3-}$

Answer [B]

89. Which one of the following is the best definition of homeostasis in mammals?

[A]Maintaining a constant internal environment

[B]Keeping the body temperature constant

[C]Getting rid of the waste products of metabolism as fast as they accumulate

[D]Maintaining a constant body mass

Answer [A]

90. If a female having gene for haemophilia on its one X-chromosome marries a normal male, then what are the chances in their offspring?

[A] 50% diseased and 50% normal

[B]All normal

[C]100% daughter are carrier

[D]50% son diseased

Answer [D]

**Hints:**

Out of the two sons one will be haemophilic.

91. Genomics is the

[A]study of complete haploid genetic complement

[B]study of chemistry of gene

[C]study of inherited phenotypes

[D]study of human gene

Answer [A]

**Hints:**

Genomics is an area within genetics that concerns the sequencing and analysis of an organism's genome.

92. Amplification of DNA fingerprinting refers to

[A]extraction of DNA

[B]separation of DNA fragment

[C]polymerase chain reaction

[D]Both [A] and [B]

Answer [B]

93. Which one of the following is a viral disease?

[A]Rabies

[B]Leprosy

[C]Malaria

[D]Tetanus

Answer [A]

**Hints:**

Rabies is a viral disease caused by rabies virus belongs to the Rhabdoviridae family.

94. Which one of the following is not contained in photochemical smog?

[A]$NO_2$

[B]$CO_2$

[C]$O_3$

[D]PAN

Answer [B]

**Hints:**

Photochemical smog does not contain CO2.

95. The Earth Summit held in 1992 at Rio de Janerio, Brazil resulted into

[A]Conservation of Biological Diversity(CBD)

[B]Man and the Biosphere Programme(MAB)

[C]Food and Agriculture Organization(FAO)

[D]World Wide Fund for Nature(WWF)

Answer [A]

96. The hormone which controls cell divison and cell differentiation is

[A]abscisic

[B]auxin

[C]gibberellin

[D]cytokinin

Answer [D]

97. DDT residues are rapidly passed through food chain causing biomagnification because DDT is

[A]moderately toxic

[B]non-toxic to aquatic animals

[C]water soluble

[D]liposoluble

Answer [D]

**Hints:**

DDT is liposoluble and can be easily absorbed by biological membranes and accumulated in fatty tissue.

98. A mutation at one base of the first codon, of a gene, produces a non-functional protein, such a mutation is called

[A] nonsense mutation

[B] mis-sense  mutation

[C] frameshift mutation

[D] reverse mutation

Answer [B]

**Hints:**

99. The most important component of the oral contraceptive pills is

[A] progesterone

[B]growth hormone

[C]thyroxine

[D]luteinizing hormone

Answer [A]

**Hints:**

Progesterone

100. HIV has a protein coat, and a genetic material which is

[A]single-stranded DNA

[B]double-stranded DNA

[C]single-stranded RNA

[D]double-stranded RNA

Answer [C]

**Hints:**

HIV has single-stranded RNA.