

**SOLUTION & ANSWER FOR COMED- K- 2009
VERSION –D**

BIOLOGY

1. Tetrarch vascular bundle is
Ans: Root of *Cicer arietinum*
Sol: Tetrarch Vascular bundle is the characteristic feature of dicot root and *Cicer arietinum* is a dicot plant.
2. Remove the odd member
Ans: *Varanus bengalensis*
Sol: *Varanus bengalensis* is a lizard, it is known as common Indian Monitor.
3. Sickle-cell anaemia is
Ans: CTC to CAC
Sol: When the nitrogen base sequence of DNA like CTC is transcribed into the RNA as GAG(codon) it means Glutamic acid in normal haemoglobin. When the DNA sequence CTC is mutated into CAC, it results the codon GUG in the RNA and the amino acid Valine is selected to causing sickle cell anaemia.
4. The Brush border of small intestine
Ans: Microvilli
Sol: The brush border type of epithelium that lines the cavity of intestine is made up of columnar epithelial cells which bears numerous microvilli at the free surface.
5. The efflux of K^+ and Cl^-
Ans: Closure of stomata
Sol: Efflux of K^+ and Cl^- results turgor loss and flaccidity in the guard cells and it causes the closure of stomata.
6. Non-cyclic electron flow
Ans: ATP, NADPH and O_2
Sol: Non-cyclic electron flow result the products like ATP, NADPH and O_2 . Evolution of O_2 results from photolysis.
7. Which is the correct pathway
Ans: Collecting duct – ureter – bladder-urethra
Sol: Urine of invertebrates from the collecting duct passes to the ureter then to the urinary bladder where it is stored, during micturition it is passed through urethra.
8. *Helicobacter pylori*
Ans: Peptic Ulcer
Sol: *Helicobacter pylori* causes peptic ulcer in humans
9. An animal hormone
Ans: Oxytocin
Sol: Oxytocin or Pitocin is secreted by neuro secretory cells of hypothalamus and stored in posterior lobe of pituitary.
10. The major constituent of
Ans: Sucrose
Sol: Sucrose is the transporting form of food material in plants tissues.

11. Which one of the following plants
 Ans: *Plumeria alba*
- Sol: *Plumeria alba*-Apocynaceae, *Acacia arabica*-Mimosoideae, *Musa paradisiac*-Musaceae and *Hibiscus rosasinensis*-Malvaceae
12. Whose doctrine influenced
 Ans: Malthus
- Sol: Malthus' doctrine regarding the population growth greatly influenced the Darwinism.
13. During silk reeling
 Ans: Stifling
- Sol: Stifling is carried by steam, dry heat, fumigation, hot water treatment or sunning.
14. Terrestrial, poikilothermal ...
 Ans: *Calotes versicolor*
- Sol: *Calotes versicolor* is a poikilothermic organism, it changes its body temperature according to the environmental temperature. It lies cleidoc egg because eggs have a calcareous shell.
15. Which one of the following ...
 Ans: Implantation
- Sol: During implantation the trophoblast(outer cell layer of blastocyst) adheres to the uterine epithelium by dissolving it with the help of proteolytic enzyme.
16. Wind-pipe in man
 Ans: Larynx
- Sol: Wind pipe is trachea which arises from the larynx.
17. Partially digested semisolid food
 Ans: Chyme
- Sol: Chyme – It is semi digested acidic pulpy mass of food present in stomach.
18. Lymphatic filariasis
 Ans: *Wuchereria*
- Sol: *Wuchereria* is a digenetic parasite causing elephantiasis or filariasis. It's intermediate host is female *Culex* mosquito.
19. The bonds present between
 Ans: Phosphoanhydride bonds
- Sol: Phospho ester bonds are formed between sugar residue molecule and phosphate (Pi). Further phosphate (Pi) combination to the AMP and ADP are due to phosphoanhydride bonds.
20. One of the following events
 Ans: Arteriosclerosis
- Sol: Arteriosclerosis is the thickening of arterial wall due to the deposition of calcium salts.
21. Find out the disease
 Ans: Huntington's chorea
- Sol: Huntington chorea is a fatal hereditary brain disease due to the insufficient amount of GABA (Gamma Amino Butric Acid) production.
22. Dorsal root of spinal nerve
 Ans: Sensory neurons only
- Sol: Spinal nerves are mixed nerves, dorsal roots comprises of sensory neurons and ventral root consists of motor neurons.
23. White eye is a ...
 Ans: All males white eyed and all females normal
- Sol: Since the white eyed character is recessive, single doze of gene in X-chromosome is enough to produce white eye in male.
24. Anemophilous flowers
 Ans: Scent and nector

Sol: Anemophilous flowers are wind pollinated, hence do not require scent and nectar.

25. Maturation and storage ...

Ans: Epididymis

Sol: Epididymis is a part of duct system of the male reproductive system.

26. The relationship among

Ans: Cardiac Output = Stroke volume \times Heart rate

Sol: Cardiac output in a normal man is 5250 ml i.e., 75×70 ml (Heart beat \times Stroke volume)

27. Pith parenchyma

Ans: Chloroplast

Sol: Pith parenchyma cells are of storage in function, hence lacks chlorophyll

28. _____ is a National park

Ans: Kudremukh

Sol: Dhandeli is the sanctuary located at Uttara Kannada district with an area of 874.20 sq.km.

29. Spongy form of

Ans: Prions

Sol: Prions are infectious Proteinaceous agents first observed by Stanley B. Prusiner. It causes nerve cell degeneration in brain.

30. The term plasmodesmata ...

Ans: Strasburger

Sol: Plasmodesmata connect protoplasts of neighbouring plant cells.

31. During DNA replication Okazaki fragments ...

Ans: Facilitate the functioning of DNA polymerase from 5' to 3' end

Sol: All the known DNA polymerases function in the 5' – 3' direction. So in the lagging strand

(Strand with 5' – 3' polarity) new DNA is synthesized as short fragments called Okazaki fragments.

32. The formation of Peptide ...

Ans: Both (b) and (c)

Sol: In protein molecule the adjacent amino acids are held together by peptide bond formed between hydroxyl group of one amino acid and NH_2 group of adjacent amino acid by means of the elimination of H_2O molecule (condensation).

33. In cloning experiments ...

Ans: Reverse transcriptase

Sol: Synthesis of DNA from m- RNA is called reverse transcription (Teminism). It is a property shown by retroviruses. In the *in-vitro* systems the c-DNA is obtained from m-RNA for the construction of c-DNA libraries.

34. Chloride shift ...

Ans: Hamberger's phenomenon

Sol: Chloride shift or Hamberger phenomenon is a process in the CO_2 transport in the RBC as carbonic acid.

35. Which of the following

Ans: Cytokinins

Sol: Cytokinins are the proteins (glycoproteins) secreted by different types of cells as an immune response. Interferons, Lymphokines, monokines, chemokines are the examples.

36. *Papaver album*

Ans: Morphine

Sol: Morphine is an alkaloid extracted from the latex of *Papaver album* and it is used as sedative.

37. Female gametophyte

Ans: Embryo sac

Sol: Embryosac of angiosperm is of 7-celled and 8-nucleated structure and is female gametophyte.

38. The Karyotype of

Ans: 44 + XXY

Sol: A male person with 47 chromosomes as $2n + 1$ (trisomy in sex chromosome) due to one extra X – chromosome results Klinefelter's syndrome.

39. The phenomena of

Ans: *Rana hexadactyla*

Sol: Amplexus or Pseudo copulation stimulate the female frog to release eggs, it is known as spawning.

40. In Eukaryotes

Ans: Exons separated by Introns

Sol: Eukaryotic genes consist coding introns and non-coding exons.

41. Which one of the following

Ans: DNA

Sol: DNA never transcribes the DNA, (DNA formation is replication), and the RNAs. (tRNA, rRNA and mRNA) are transcribed by the DNA.

42. Golden rice is a

Ans: β -carotene and ferritin

Sol: Vitamin-A enriched β -carotene and ferritin are produced by the Golden rice (Miracle rice).

43. Which among the following

Ans: Wood

Sol: Periderm consists of phellogen, secondary cortex and cork – the whole tissues outside the 2° phloem.

44. Puffs of Polytene chromosomes

Ans: RNA-polymerases

Sol: Polytene chromosomes are characterized with high content of RNA-polymerase for the synthesis of RNA.

45. Ethylene is a

Ans: Methionine

Sol: Ethylene is a product of metabolism of methionine amino acid in senescing tissues of plants.

46. Which of the following

Ans: Tumour cells

Sol: Hybridoma is a hybrid of B- lymphocyte and Myeloma cell, the technology is used for the large scale production of desired antibody in pure form.

47. According to operon concept

Ans: Control the expression of structural genes

Sol: Operon model is proposed by Jacob and Monod to explain the regulation of gene expression. Two types of operons are the Inducible operon and repressible operon.

48. Somatic cell hybrids

Ans: Polyethylene glycol

Sol: Poly ethylene glycol (PEG) promotes the fusion of somatic cells and results somatic hybrids.

49. Interfascicular cambium

Ans: Secondary meristem

Sol: Interfascicular cambium is formed from the parenchyma cells of the medullary rays.

50. Choose the group
 Ans: Wolf, Fowl, Rabbit.
 Sol: Reptiles, birds and mammals are amniotes.
51. Dachigam wild life sanctuary
 Ans: Kashmir stag
 Sol: Kashmir stag is the Hangul deer common in Dachigam Sanctuary in Kashmir.
52. Vein loading of
 Ans: Active transport
 Sol: Vein loading means the movement of photosynthetic carbohydrate from mesophyll cells into the phloem.
53. Conversion of phosphoenol
 Ans: Substrate level phosphorylation
 Sol: Phosphorylation results due to the conversion of one substrate into another form is known as substrate level phosphorylation.
54. Lower vascular plants
 Ans: Gymnosperm
 Sol: Due to the absence of ovary wall, fruits never develop in Gymnosperms and the seeds are naked in nature.
55. Which of the following has not been
 Ans: Haemoglobin
 Sol: Haemoglobin is a transporting molecule in the blood.
56. The functional xylem
 Ans: Albumum
 Sol: Albumum or sap wood is the newly formed xylem which is physiologically active and conductive in function.
57. Which one of the pathways of water
 Ans: Apoplast pathway
 Sol: Apoplast include cell wall and intercellular spaces regarding the pathway of water in plant tissues.
58. The last electron acceptor ...
 Ans: O₂
 Sol: In the ETS reaction, the e⁻ and H⁺ are oxidised into the H₂O by means of molecular O₂ (final e⁻ acceptor).
59. _____ forest of Sundarbans
 Ans: Mangrove
 Sol: Sunderbans are the biggest Mangrove forest (marshy land vegetation) in India.
60. Macrophages are the modified _____
 Ans: Monocytes
 Sol: Macrophages are phagocytic cells.