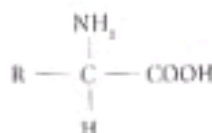


In each of the questions 01 to 60, pick correct or most appropriate answer

01. The chemical formula given above represents the basic constituent unit of

- (1) lipids
(2) proteins
(3) nucleic acids
(4) cellulose
(5) starch



02. Which of the following is considered as the basic unit of life

- (1) Atom
(2) Amino acids
(3) DNA
(4) Proteins
(5) Cell

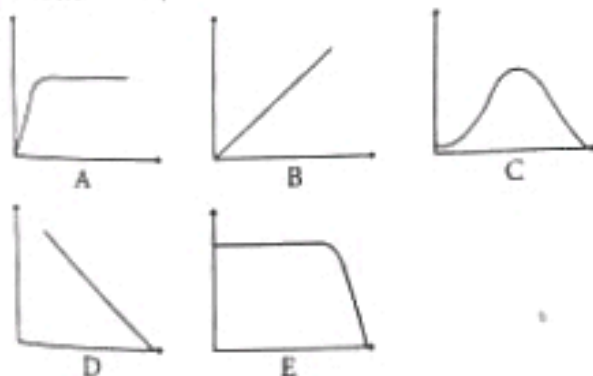
03. Ribosomes found in the chloroplasts of a plant cell

- (1) are of the same size and composition to those seen in bacteria
(2) are larger than those seen in bacteria but similar in composition
(3) are smaller than those seen in bacteria and differ in composition
(4) are of the same size as those seen in bacteria but different in composition
(5) are similar in size and composition to those found in the cytoplasm of that eucaryotic cell

04. The source of oxygen which acts as the terminal electron acceptor in the electron transport chain of aerobic organisms is

- (1) water (2) glucose (3) acetyl Co-A
(4) molecular oxygen (5) pyruvic acid

- The questions 05 and 06 are based on the following graphs (A - E), which show the rate of enzyme reaction (vertical axis) plotted against an unlabelled factor (horizontal axis).



05. Which one of the above graphs shows the relationship between rate of an enzyme reaction and pH?

- (1) A (2) B (3) C (4) D (5) E

06. Which one of the above graphs shows the relationship between rate of an enzyme reaction and substrate concentration?

- (1) A (2) B (3) C (4) D (5) E

07. Which one of the following statements regarding biodiversity is correct?

- (1) The three major divisions of biodiversity are species diversity, genetic diversity and habitat diversity
(2) Species diversity is the diversity among the organisms within a species
(3) Because of the increasing concern on biodiversity, all species that live on earth are most likely to be identified within the next 10 years.
(4) The most number of animal species identified so far belong to the phylum Mollusca.
(5) Genetic diversity contributes to the development of insecticide resistant varieties among insect pests.

08. Which one of the following correctly represents the scientific name of man according to binomial nomenclature?

- (1) *Homo Sepians*
(2) *Homo sapiens sapiens*
(3) *Homo sapiens*
(4) *Homo sapiens*
(5) *Homo sepians*

09. The last mass extinction on earth resulted in the extinction of

- (1) ammonites (2) trilobites
(3) primitive bony fishes (4) dinosaurs
(5) mammoths.

10. Which one of the following is an *in-situ* method of conservation?

- (1) Establishment of sanctuaries
(2) Establishment of turtle hatcheries
(3) Establishment of elephant orphanages
(4) Establishment of seed banks.
(5) Establishment of botanical gardens.

11. Which one of the following IUCN categories includes the organisms that are most likely to become extinct first?

- (1) Low risk category
(2) Vulnerable category
(3) Rare category
(4) Conservation dependent category
(5) Data deficient category

12. Which one of the following is **not** essential for the production of action potential in a neurone?

- (1) Neurilemma (2) Threshold stimulus
(3) Extracellular fluid (4) Myelin sheath
(5) Na^+ and K^+

The first group of animals to develop photoreceptors during evolution is

- (1) coelenterates. (2) flat worms.
(3) annelids. (4) arthropods.
(5) molluscs.

Which one of the following is **unlikely** to cause hypertension

- (1) High level of low density lipoproteins in blood
(2) Heavy consumption of alcohol
(3) Sleep disturbances
(4) Mental relaxation
(5) Ageing

Which one of the following statements regarding the adult human skull is **incorrect**?

- (1) It is made up of 22 bones
(2) It has a capacity of around 2 litres
(3) It protects the middle ear.
(4) Foramen magnum is located at its base
(5) Mandible articulates with the cranium

Which one of the following statements regarding the digestive enzymes of man is **incorrect**?

- (1) Amylase converts starch into maltose
(2) Lipase converts fats into fatty acids and glycerol
(3) Pepsin converts proteins into amino acids
(4) Lactase converts lactose into glucose and galactose
(5) Chymotrypsin converts proteins into peptides and amino acids

Which one of the following animals has a closed blood circulatory system with a single circulation?

- (1) Cockroach (2) Earth worm (3) Starfish
(4) Man (5) Filaria worm

Questions 18 and 19 are based on the table given below. In the first Column of the table, three parts of the inner ear of man are given. The major functions of these parts are given in the second column and the locations of these parts in the inner ear are given in the third column.

Part of the inner Ear	Major function	Location in the inner Ear
- utricle	P- Involved in hearing	X- semicircular canals
- Ampullae	Q - Involved in the detection of the movement of head	Y- Vestibule
- Organ of Corti	R - Involved in the maintenance of position of head	Z - Cochlea

The correct sequence of the major functions of the parts A, B and C is

- (1) P, Q, R. (2) Q, R, Y. (3) R, P, Q.
(4) R, Q, P. (5) P, R, Q.

The correct sequence of the locations of the parts A, B and C in the inner ear is

- (1) X, Y, Z. (2) X, Z, Y. (3) Y, Z, X.
(4) Z, X, Y. (5) Y, X, Z.

20. In man, a thoracic vertebra can be distinguished from other vertebrae due to

- (1) its large size
(2) the presence of vertebral canal.
(3) the presence of a bifurcated neural spine
(4) the absence of an odontoid process.
(5) the presence of articular surfaces on the centrum

21. Which one of the following statements is **incorrect** regarding regulation of respiration in man?

- (1) Lowered blood pH increases respiratory rate
(2) Stimulation of stretch receptors in lungs causes inspiration to stop
(3) Respiratory centre is located in the pons Varoli and hypothalamus
(4) Chemoreceptors involved in regulation are located in carotid arteries.
(5) Both glossopharyngeal and vagus nerves are involved in the regulation of respiration

22. Which one of the following factors can be considered as least important in the vertical transport of water through the xylem in a tall tree?

- (1) Cohesive force (2) Transpiration pull
(3) Adhesive force (4) Water potential gradient
(5) Root pressure

23. Which one of the following element when absent will produce deficiency symptoms first in the mature parts of the plant?

- (1) K (2) Mg (3) S (4) Cu (5) N

24. A major function of K^+ in a plant is seen in

- (1) stomatal movement
(2) chlorophyll synthesis
(3) cell division
(4) electron transport chain
(5) synthesis of vitamins

25. Which one of the following represents the first stable product of C - 4 photosynthesis

- (1) Phosphoglyceric acid
(2) Oxaloacetate
(3) Malic acid
(4) Phosphoenol pyruvate
(5) Glycolate

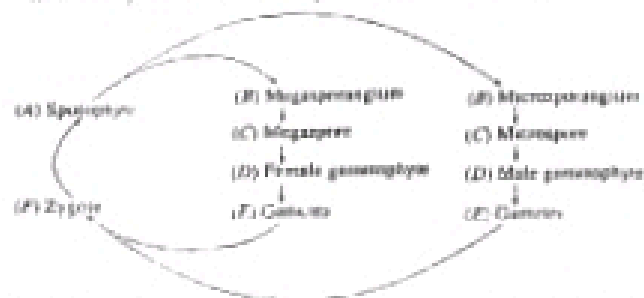
26. Which one of the following is seen only in angiosperms?

- (1) Development of an embryo in the life cycle
(2) Presence of seeds
(3) Presence of heteromorphic alternation of generation in the life cycle
(4) Presence of double fertilization in the life cycle
(5) Presence of xylem and phloem in the vascular system

27. In which one of the following structures does meiosis take place?

- (1) Sporangium of *Mucor*.
(2) Basidium of *Agaricus*.
(3) Antheridium of *Pogonatum*.
(4) Microspore of *Selaginella*
(5) Pollen tube of angiosperms.

Questions 28 and 29 are based on the following chart of the life cycle of a heterosporous vascular plant.



28. Which of the following plants show life cycles represented by the above chart?
- (1) *Nephrolepis* and *Pogonatum*
 - (2) *Selaginella* and *Nephrolepis*
 - (3) Angiosperms and *Cycas*
 - (4) *Nephrolepis* and angiosperms
 - (5) *Selaginella* and *Pogonatum*
29. The haploid generation in the above life cycle is represented by stages
- (1) A, B and C
 - (2) B, C and D
 - (3) C, D and E.
 - (4) D, E and F
 - (5) E, F and A.
30. A diagram of a cross-section of a root indicating the three major pathways (A, B, C) of horizontal water transport across the root is shown here. Which of the following represents the apoplast pathway, symplast pathway and vacuolar pathway in correct order?
- (1) A, B, C
 - (2) A, C, B
 - (3) B, C, A
 - (4) B, A, C
 - (5) C, B, A
-
- The diagram shows a cross-section of a root with several cells. Pathway A is shown as a line passing through the cell walls (apoplast). Pathway B is shown as a line passing through the cytoplasm of adjacent cells (symplast). Pathway C is shown as a line passing through the vacuoles of cells (vacuolar).

• Questions 31 and 32 are based on the data given below

Tall tomato plants having red fruits were crossed with short tomato plants having orange fruits. All plants in F_1 generation were tall with red fruits. When F_1 plants were crossed with each other the following phenotypic ratio was obtained in the F_2 generation.

Tall plants having red fruits Short plants having orange fruits



31. Which one of the following statements is correct regarding the above observations?
- (1) The tall parent plants with red fruits are heterozygous.
 - (2) Both types of parents are heterozygous
 - (3) Independent assortment is shown by both characters
 - (4) In F_2 generation, 50% are heterozygous
 - (5) The F_1 plants are heterozygous for one character
32. If the above F_1 plants are crossed with short plants having orange fruits, the percentage of short plants having orange fruits in the resulting progeny would be
- (1) 100 %
 - (2) 66 %
 - (3) 50 %
 - (4) 33 %
 - (5) 25 %

33. Which one of the following is not necessary for the replication of DNA?
 (1) Adenosine triphosphate
 (2) m-RNA
 (3) Endonuclease
 (4) DNA templates
 (5) Ligase
34. Adverse impacts on the environment due to human activities started with
 (1) the origin of man.
 (2) industrialization.
 (3) urbanization
 (4) hunter - gatherer life style.
 (5) agriculture and animal husbandry
35. In which one of the following trophic levels of a paddy field ecosystem, the interspecific competition is most likely to be reduced on the application of weedicides?
 (1) Primary producer level
 (2) Primary consumer level
 (3) Secondary consumer level
 (4) Tertiary consumer level
 (5) Decomposer level
36. Sustainable development is best defined as
 (1) meeting the present day needs without compromising the ability of future generations to meet their own needs
 (2) the development which promotes equal distribution of benefit of the use of natural resources
 (3) the development achieved with minimum environmental pollution.
 (4) achieving a good standard of living utilizing minimum amount of resources
 (5) the development achieved with a minimum loss of biodiversity

37. It is believed that the major reason for the increase in the carbon dioxide concentration in the atmosphere during the last two centuries is
- (1) the increase in human population
 - (2) the increase in agricultural crop productivity
 - (3) the decrease in plant cover
 - (4) the increase in fossil fuel consumption
 - (5) the increase in animal husbandry activities.
38. Chromium was detected in water samples collected from a lagoon. This water is most likely to be contaminated with
- (1) agrochemicals.
 - (2) leather factory effluents
 - (3) domestic sewage.
 - (4) paper factory effluents
 - (5) oil
39. Which one of the following genera of bacteria contains a species widely used for the industrial production of glutamic acid?
- | | |
|----------------------------|------------------------|
| (1) <i>Corynebacterium</i> | (2) <i>Pseudomonas</i> |
| (3) <i>Escherichia</i> | (4) <i>Acetobacter</i> |
| (5) <i>Clostridium</i> | |

40. The antibiotic erythromycin destroys bacteria
- (1) inhibiting the cell wall synthesis.
 - (2) inhibiting protein synthesis
 - (3) inhibiting DNA replication
 - (4) inhibiting synthesis of cell membrane
 - (5) causing leakages in cell membrane
41. Which one of the following chemical conversions in the nitrogen cycle is effected by *Nitrobacter*?
- (1) $\text{NO}_3^- \rightarrow \text{NO}_2^-$
 - (2) $\text{NH}_4^+ \rightarrow \text{NO}_2^-$
 - (3) $\text{NO}_2^- \rightarrow \text{NH}_4^+$
 - (4) $\text{NO}_3^- \rightarrow \text{N}_2$
 - (5) $\text{N}_2 \rightarrow \text{NH}_4^+ / \text{NH}_3$
42. Which one of the following genera contains microorganisms that will **not** grow in the presence of molecular oxygen?
- (1) *Saccharomyces*
 - (2) *Rhizobium*
 - (3) *Clostridium*
 - (4) *Pseudomonas*
 - (5) *Acetobacter*
43. Agar is added to microbiological culture media
- (1) to provide nutrients
 - (2) to obtain colonies of microorganisms
 - (3) to prevent the growth of unwanted microorganisms
 - (4) to grow fungi
 - (5) to limit the growth of microorganisms
44. Which one of the following groups of diseases is caused only by bacteria?
- (1) Tetanus, measles, tuberculosis
 - (2) Tetanus, typhoid, tuberculosis
 - (3) Typhoid, chicken pox, syphilis
 - (4) Tetanus, pneumonia, measles
 - (5) Tuberculosis, pneumonia, measles
45. A carangid could be easily distinguished from a grey mullet due to the presence of
- (1) two dorsal fins.
 - (2) terminal mouth.
 - (3) forked tail fin
 - (4) spinous anal fin
 - (5) thickened lateral scales
46. Which one of the following statements is **incorrect** regarding aquaculture in Sri Lanka?
- (1) *Oreochromis niloticus* produced from extensive aquaculture contributes to fresh water fish production.
 - (2) In the recent past, virus infections have caused severe damage to prawn aquaculture.
 - (3) Aquaculture industry still does not have the technology to produce post larvae of prawns.
 - (4) Intensive culture of fin fish for food is not yet practiced.
 - (5) There is a high potential to culture Indian carps in the seasonal reservoirs.
47. Which one of the following statements regarding the transmission of parasites is **incorrect**?
- (1) Transmission of *Entamoeba histolytica* occurs at post cyst stage.
 - (2) *Plasmodium vivax* is transmitted by Anopheles culicifacies
 - (3) Peak transmission of *Wuchereria bancrofti* takes place between 6.00 p.m. and 10.00 p.m.
 - (4) Skin piercing is essential for transmission of *Haemaphysalis americanus*.
 - (5) *Ascaris lumbricoides* can be transmitted by eating faecal contaminated vegetables
48. Which one of the following statements is **correct** regarding organophosphate insecticides?
- (1) They are fat soluble
 - (2) They inactivate cholinesterase
 - (3) They are not very toxic to mammals
 - (4) They act on neurilemma
 - (5) They are usually persistent in the environment
49. Blight diseases in paddy are caused by
- (1) *Rhizoctonia* species only
 - (2) *Xanthomonas* species only.
 - (3) *Rhizoctonia* and *Xanthomonas* species
 - (4) a nematode
 - (5) brown hopper
50. The standard deviations of the sample obtained from two populations are 10 and 7.8. If the size of each sample is 10, the standard error of these data is approximately
- (1) $\sqrt{1.78}$
 - (2) 1.78
 - (3) 1.78
 - (4) 4
 - (5) 17.8
- For each of question 51 to 60 one or more of the responses is/are correct. Decide which of the response responses is/are correct and then select the correct number.
- If only A, B and D are correct _____
- If only A, C and D are correct _____
- If only A and B are correct _____
- If only C and D are correct _____
- If any other response or combination of responses is correct _____

Directions Summarised				
1	2	3	4	5
A, B, D correct	A, C, D correct	A, B correct	C, D correct	any other response or combination of responses correct

51. Which of the following compounds is/are produced during light reactions of photosynthesis
- (A) Oxygen
 - (B) NADPH₂
 - (C) NADH₂
 - (D) ATP
 - (E) Starch

52. Which of the following bacteria is/are involved in food infections caused by the growth and activity of microorganisms present in the ingested food?

- (A) *Salmonella typhi*
- (B) *Shigella*
- (C) *Staphylococcus aureus*
- (D) *Vibrio cholera*
- (E) *Clostridium botulinum*

53. Animals belonging to Class Chondrichthyes

- (A) have placoid scales
- (B) have no operculum
- (C) possess tail fins with two similar lobes
- (D) have skeletons made up of bone
- (E) live both in fresh water and marine habitats

54. Which of the following statements is/ are correct regarding a skeletal muscle fibre?

- (A) Its contractile activity is controlled by the autonomic nervous system.
- (B) It never becomes fatigued
- (C) It is unbranched
- (D) It contains many sarcomeres
- (E) It is uninucleate.

55. Which of the following statements regarding vitamin E is/are correct?

- (A) It aids in cellular respiration
- (B) It is found in green vegetables
- (C) It is water soluble
- (D) It is required for the production of co-enzyme A.
- (E) Its deficiency causes night blindness

56. Which of the following statements is/are correct regarding human nephron?

- (A) It is involved in the regulation of blood glucose level.
- (B) Obligatory resorption of water occurs in the proximal convoluted tubule

(C) Active resorption of Na^+ occurs in the descending limb of loop of Henle.

(D) Resorption of Cl^- occurs in the proximal convoluted tubule.

(E) ADH acts on the ascending limb of loop of Henle

57. Which of the following features cannot be seen in Bryophytes?

- (A) Heteromorphic alternation of generation
- (B) Independent sporophyte
- (C) Flagellated reproductive structures
- (D) Heterospory
- (E) Reproductive structures with sterile cells

58. Evolution of which of the following features made the man different from all other animals?

- (A) Bipedalism
- (B) Stereoscopic vision
- (C) Speech
- (D) Conceptual thought
- (E) large brain

59. Which of the following processes decrease/decreases the amount of nitrogen in an agricultural soil?

- (A) Leaching
- (B) Nitrification
- (C) Denitrification
- (D) Absorption by plants
- (E) Removal of the harvest

60. Which of the following major biochemical changes effected by microorganisms is/are involved in the production of vinegar from coconut sap (sweet toddy)?

- (A) Conversion of sucrose to glucose by yeast
- (B) Conversion of starch to glucose by yeast
- (C) Conversion of glucose to ethanol by fermentation by yeast
- (D) Oxidation of ethanol to acetic acid by *Acetobacter*
- (E) Conversion of sucrose to lactic acid by lactic acid bacteria