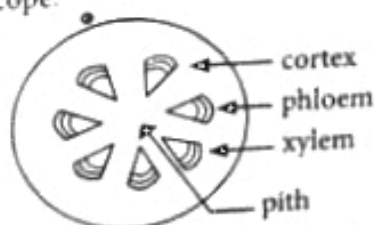


* In each of the questions 01 to 60, pick correct or most appropriate answer

01. Which of the following is common in plant, animal and bacterial cells?
 (1) Mitochondria (2) Cytoskeleton
 (3) Golgi complex (4) Ribosomes
 (5) Centriole
02. Which of the following statements is incorrect regarding lysosomes?
 (1) They are derived from Golgi complex
 (2) They are double membrane bound organelles
 (3) They contain different types of digestive enzymes
 (4) They help in recycling cellular materials.
 (5) They are found only in eukaryotic cells.
03. Which of the following statements is incorrect regarding ATP?
 (1) ATP is a nucleotide
 (2) ATP is produced during photosynthesis
 (3) In aerobic respiration most ATP per molecule of glucose is produced during Kreb's cycle.
 (4) ATP is used in muscle contraction.
 (5) ATP is utilized in both respiration and photosynthesis.
04. Which one of the following metabolic pathways is common to both fermentation and aerobic respiration?
 (1) Glycolysis.
 (2) Conversion of pyruvate to alcohol
 (3) Electron transport chain
 (4) Kreb's cycle
 (5) Synthesis of acetyl Co-A from pyruvate
05. Which of the following statements is correct?
 (1) Sucrose gives a brick red precipitate when heated with Fehling's solution
 (2) Albumin gives a violet colour when heated with alkaline copper sulphate
 (3) Lignin stains yellow with safranin
 (4) Coconut oil is stained yellow with sudan oil
 (5) Glycogen gives a yellow precipitate with Millon's reagent.
06. Which one of the following organisms is most likely to have been present on earth before 3.5×10^9 years?
 (1) Autotrophic bacteria (2) Heterotrophic bacteria
 (3) Unicellular algae (4) Ciliates
 (5) Viruses
07. Which of the following is a general feature of the Class Dicotyledoneae?
 (1) Perianth is not differentiated into calyx and corolla.
 (2) Presence of dissected leaves
 (3) Presence of scattered vascular bundles in the stem
 (4) Presence of reticulate venation
 (5) Absence of vascular cambium
08. The invertebrate phylum that is evolutionarily most related to the Phylum Chordata is
 (1) Arthropoda. (2) Annelida
 (3) Echinodermata (4) Mollusca
 (5) Platyhelminthes.
09. Which of the following is correct regarding fungi?
 (1) Spores are produced only during asexual reproduction
 (2) Diploid stage is represented in the vegetative phase
 (3) Heterothallism is of common occurrence.
 (4) During reproduction fusion of cytoplasm and fusion of nuclei take place simultaneously
 (5) Flagellated cells are produced during reproduction
10. Which of the following is not a part of the apoplast of a plant?
 (1) Cell wall of a parenchyma cell
 (2) Cavity of a xylem vessel
 (3) Cavity of a sieve tube
 (4) Cell wall of guard cells
 (5) Cell wall of transfer cells
11. Which one of the following could be considered as a passive process?
 (1) Movement of mineral ions from soil solution into vacuoles of root hair cells
 (2) Movement of sucrose from mesophyll cells into sieve tubes.
 (3) Movement of sucrose from one sieve tube element to the next sieve tube element.
 (4) Movement of K^+ ions from guard cells into epidermal cells.
 (5) Movement of Na^+ ions from the glomerular filtrate through the wall of proximal convoluted tubule.
12. Which one of the following situations contributes to the opening of stomata?
 (1) When K^+ ions move out of guard cells into neighbouring cells
 (2) When water potential of guard cells decreases below that of neighbouring cell
 (3) When guard cells absorb water by active transport
 (4) When concentration of starch in guard cells increases
 (5) When humidity of the atmosphere increases rapidly
13. When a piece of leaf epidermis was immersed in distilled water for thirty minutes the cells became fully turgid and attained equilibrium. Which one of the following statements is correct with regard to these cells in equilibrium?

- (1) Water potential and solute potential of the cell sap have equal and opposite values
 (2) Water potential and pressure potential of cell sap have equal values
 (3) Solute potential and pressure potential of cell sap have equal and opposite values
 (4) Water potential of cell sap is less than Water potential of distilled water
 (5) Solute potential of cell sap is more than the pressure potential of cell sap
14. Which one of the following substances is **incorrectly** paired with its function?
 (1) Auxin - root elongation.
 (2) Cytokinin - induction of senescence in plants.
 (3) Gibberellin - seed germination.
 (4) Abscissic acid - seed dormancy.
 (5) Parathormone - regulation of blood calcium level.
15. Which of the following is **incorrect** regarding RuBP carboxylase enzyme?
 (1) It is present in the chloroplast.
 (2) It uses carbon dioxide as a substrate
 (3) It is absent in C_4 plants
 (4) It catalyses the production of PGA
 (5) It participates in photosynthesis
16. Which of the following statements is **incorrect** regarding the light reactions of photosynthesis?
 (1) They take place in the thylakoid membrane of grana in the chloroplast
 (2) The electrons lost by P_{680} in photosystem I is replaced by electrons from photolysis of water.
 (3) Photosystem II provides energy in the form of ATP for dark reactions
 (4) Photosystem I $NADPH_2$ for the dark reactions
 (5) Electrons acceptors and carriers involved in light reactions are located within thylakoid membrane
17. The diagram given below represents a cross section of a part of a plant as seen under the low power of a microscope.



Which of the following statements is correct regarding the above diagram?

- (1) It has bicollateral vascular bundles.
 (2) It represents a transverse section of a dicot stem
 (3) Metaxylem of the vascular bundles is located towards the centre of the diagram.
 (4) Tissues shown are primary and secondary in origin
 (5) It represents a transverse section of monocot root

18. Which of the following is **incorrect** regarding both *selaginella* and *cycas*?
 (1) male gametes are motile.
 (2) Female gametophyte produces several archegonia.
 (3) Megaspore produces one female gametophyte
 (4) Embryo is nutritionally supported by female gametophyte
 (5) Sporophytes are dioecious
19. Which of the following statements is correct regarding the human liver?
 (1) It is the largest organ of the body.
 (2) It lies mainly in the upper left region of the abdomen
 (3) It synthesises haemoglobin
 (4) It plays a role in the digestion of food
 (5) It is not involved in temperature regulation
20. Which of the following statements is **incorrect** regarding animals skeletons?
 (1) Skeletons assist in locomotion
 (2) Annelids have a hydrostatic skeleton.
 (3) Exoskeletons limit the growth of animals.
 (4) Endoskeletons are confined to vertebrates.
 (5) mammalian skeleton is involved in calcium homeostasis
21. Which one of the following group of animals have eyes very much similar to those of vertebrates?
 (1) Annelids (2) Arthropods
 (3) molluscs (4) Platyhelminthes
 (5) Echinoderms
22. The deficiency of which of the following vitamins contributes to bleeding of gums?
 (1) A (2) B_6 (3) C (4) E (5) K
23. Collagen is a
 (1) polysaccharide. (2) protein.
 (3) steroid. (4) lipoprotein.
 (5) glycoprotein.
24. Which of the following statements is **incorrect** regarding human milk?
 (1) It is the best food that can be given to an infant
 (2) Its synthesis is stimulated by oxytocin
 (3) It provides antibodies to the infant.
 (4) It has iron binding proteins.
 (5) It is virtually sterile.
25. Skeletal muscle fibre
 (1) is spindle shaped.
 (2) is striated.
 (3) shows myogenic contractions.
 (4) is uninucleate
 (5) never gets fatigued
- Questions No. 26 and 27 are based on the following table. Three parts of the human brain are listed in the first column. The second column gives their major functions and the third column gives their origin.

column 1 Parts of the brain	column 2 Major function	column 3 Origin
A- Hypothalamus	L- Control of eye movements	P- Hindbrain
B- Cerebellum	M- Coordination of voluntary muscle action	F- Midbrain
C- Corpora quadrigemina	N- Homeostasis	R- Forebrain

26. The correct sequence showing the major functions of A, B, and C is.

- (1) M, L, N. (2) N, L, M. (3) N, M, L.
(4) L, N, M. (5) M, N, L.

27. The correct sequence showing the origin of A, B and C is

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

28. Which of the following statements is incorrect regarding mutations?

- (1) They occur spontaneously in cells
(2) They are very important for the evolution of organisms
(3) They are always transmitted to the next generation during reproduction
(4) They may occur when meiosis takes place.
(5) They may change the number of chromosomes in a cell.

29. Which of the following developments of the DNA technology is not used in the human DNA finger printing technique?

- (1) Ability to use minute quantities of DNA for analysis.
(2) Ability to cut long DNA molecules into small fragments using enzymes.
(3) Ability to separate small DNA molecules by electrophoresis
(4) Ability to determine the sequence of nucleotides in a DNA molecule.
(5) Ability to identify specific DNA molecules using DNA probes.

30. In a species of pea plants, when a red flowered plant was crossed with a white flowered plant, the F_1 plants produced red flowers. When the F_1 plants were self pollinated the F_2 generation showed red flowered plants and white flowered plants in 16 : 1 ratio. Which of the following is most likely explanation for the inheritance?

- (1) The colour of the flower is determined by linked genes.
(2) The flower colour demonstrates polygenic inheritance.
(3) Two independently segregating genes are involved
(4) Red colour of the flower is an incompletely dominant character
(5) The flower colour demonstrates poly allelic inheritance

31. Which of the following statement is incorrect?

- (1) In the nucleus of a somatic cell of a diploid organism there are two identical sets of chromosomes.
(2) All chromosomes in the nucleus duplicate before meiosis
(3) Only some parts of human X and Y chromosomes are homologous
(4) Certain disorders in humans are caused by the presence of more than 44 autosomes.
(5) Exchange of parts of chromosomes can take place during meiosis

32. Which of the following is required to maintain the Hardy-Weinberg equilibrium in a population?

- (1) Flow of genes from other populations.
(2) Occurrence of mutations
(3) Occurrence of migrations
(4) Selective advantages of alleles in survival.
(5) Random mating.

33. Which of the following statements is incorrect?

- (1) Resources are materials used in everyday life for economic development
(2) Ecosystems constitute both non-living and living resources.
(3) Soil is a renewable resource.
(4) Water is a non-renewable resource
(5) Some non-living resources can be recycled

34. What is the approximate percentage of land covered by forests in Sri Lanka at present?

- (1) 10% (2) 20% (3) 30% (4) 40% (5) 50%

35. Which of the following international conventions is associated with the management of hazardous wastes?

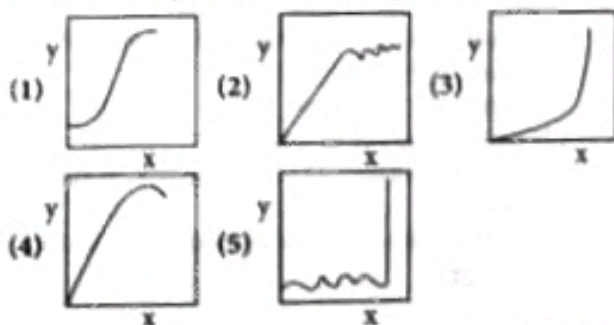
- (1) CITES
(2) Basel convention
(3) Ramsar convention
(4) Montreal protocol
(5) Biodiversity convention

36. Which of the following is directly responsible for recycling of mineral elements within an ecosystem?

- (1) Primary producers
(2) Primary consumers
(3) Decomposers
(4) Parasites
(5) Secondary consumers

37. Which of the following graphs best indicates the change in the global human population size with time?

(x axis = time, y axis = human population size)



38. Which of the following is **incorrect** regarding micro organisms?
- (1) They are the most abundant group of organisms in the biosphere
 - (2) They are the fastest reproducing organisms.
 - (3) They play an important role as primary producers in land ecosystems
 - (4) They show four different types of nutrition.
 - (5) They are the major decomposers on earth

39. Which of the following samples clearly shows the presence of both bacteria and yeasts in unstained preparations under the high power of light microscope?
- (1) pond water sample
 - (2) Vinegar sample.
 - (3) Toddy sample.
 - (4) Dilute soil extract
 - (5) Yoghurt sample

- Questions 40 and 41 are based on the following bacteria which are used in microbial technology.

- (1) *Lactobacillus bulgaricus*
- (2) *Bacillus thuringiensis*
- (3) *Thiobacillus ferrooxidans*
- (4) *Streptomyces griseus*
- (5) *Corynebacterium glutamicum*

40. Which of the above bacteria is used in an industrial process for the extraction of metallic copper ores?

41. Which of the above bacteria is used as a bio pesticide to control certain insect pests in crop plants?

42. Which of the following statements is **incorrect** regarding viruses?

- (1) Most plant viruses contain DNA.
- (2) Animal viruses contain either DNA or RNA
- (3) Some viruses contain enzymes
- (4) All viruses are obligate parasites
- (5) Viruses are used in DNA recombinant technology

43. Which of the following methods is suitable to sterilize a liquid culture medium containing blood serum?

- (1) Pasteurization.
- (2) Autoclaving at 121°C for 10 minutes
- (3) Boiling at 100° for 10 minutes
- (4) Filtration using a sterile membrane filter
- (5) Freezing at -20°C

44. Which of the following **cannot** be considered as an environmental problem caused due to prawn farming?

- (1) Increase in soil erosion.
- (2) Deterioration of water quality in coastal water bodies.
- (3) Flooding of coastal areas
- (4) Loss of grazing lands for cattle.
- (5) Increase in salinity in nearby lagoons

45. Ornamental fish reared in aquarium were found to swim with their mouth open at the surface of water. This may be due to

- (1) a parasitic infection.
- (2) decrease in pH of water
- (3) high abundance of phytoplankton at the surface of water
- (4) low dissolved oxygen content in the water
- (5) hunger

- Questions 46 and 47 are based on the following insect pests
- (A) Red weevil
 - (B) Black beetle
 - (C) Brown plant hopper
 - (D) Yellow stem borer
 - (E) Case bearer

46. Which of the above pests causes damage to crop plants only during its adult stage?
- (1) A
 - (2) B
 - (3) C
 - (4) D
 - (5) E

47. Which of the above pests have biting and chewing mouth parts during both the larval and adult stages?
- (1) A and B
 - (2) C and D
 - (3) A and E
 - (4) C and E
 - (5) B and D

48. Which one of the following statements is **incorrect** regarding tissue culture techniques?

In tissue culture techniques

- (1) large number of plants are produced within a short time
- (2) new species of plants are produced.
- (3) plant tissues are cultured in artificial media.
- (4) plants are cultivated free of climatic influence
- (5) uniform quality is maintained in plant populations

49. Which of the following organisms is least harmful to man?

- (1) *Plasmodium vivax*
- (2) *Entamoeba coli*
- (3) *Wuchereria bancrofti*
- (4) *Clostridium tetani*
- (5) *Necator americanus*

50. Which one of the following is needed to determine whether the observed frequencies of different phenotypes, of the offspring of a genetic cross are significantly different from the expected frequencies?

- (1) Chi-square value
- (2) Standard deviation
- (3) Mean
- (4) Standard error
- (5) Model value

- 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 1

If only A, C and D are correct 2

If only A and B are correct 3

If only C and D are correct 4

If any other response or combination of responses is correct 5

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 organelle/ organelles is/are involved in detoxification?
- Smooth endoplasmic reticulum
 - Peroxisomes
 - Golgi complex
 - Glyoxisomes
 - Lysosomes
52. Which of the following statement/statements regarding biodiversity is / are false?
- Increase in human population size is a root cause loss the loss of biodiversity on earth.
 - Ex-situ conservation practices have helped to conserve some endangered species of Sri Lanka
 - If conservation strategies are properly implemented animals and plants can be protected from the threat of extinction
 - Human use of living resources always result in an increase in the rate of extinction of these resources.
 - Evolution of certain biological processes has resulted in the expansion of biodiversity in the past.
53. A group of students studied the species diversity freshwater and terrestrial ecosystems and grouped the organisms observed into different taxa. Organisms belonging to which of the following taxa/taxon may have been observed in both ecosystems?
- Hirudinea
 - Insecta
 - Hydrozoa
 - Anthophyta.
 - Bryophyta
54. Which of the following could be considered as relict organisms?
- Dinosaurs
 - Trilobites
 - Lamp shells
 - Ichthyophis* Sp.
 - Sri Lankan elephants
55. In man
- spermatogenesis begins during foetal stage
 - seminal vesicles store sperms
 - sperm maturation occurs in the epididymis
 - Sertoli cells are found in the walls of seminiferous tubules.
 - Vas deferens Secrete seminal fluid.
56. The exchange of respiratory gases through the body surface
- is not an adaptation to terrestrial life
 - is efficient when surface: volume ratio is high.
 - occurs via active transport
 - is a major feature that contributed to increase in biodiversity on earth
 - is confined to invertebrates.
57. Which of the following hormone /hormones is/are released in a mammalian prey in seeing a predator?
- Cortisol
 - Adrenaline
 - Thyroxine
 - Adrenocorticotrophic hormone (ACTH)
 - Insulin
58. Which of the following contribute/contributes to global warming?
- Increase in carbon dioxide in the atmosphere
 - Large scale deforestation
 - Depletion of ozone in the atmosphere
 - Use of coal in thermal power plants
 - Increased penetration of ultraviolet rays into lower levels of the atmosphere
59. Acid rain occurs when atmosphere is polluted with
- sulphur dioxide.
 - nitrogen dioxide
 - carbon monoxide
 - carbon dioxide
 - ozone.
60. In a normally distributed population
- The difference between the largest and the smallest values is approximately equal to three times of the standard deviation.
 - mean value is slightly smaller than the modal value
 - standard deviation is smaller than the mean.
 - the frequency distribution pattern is symmetrical around the mean.
 - more than 75% of the observations take a value between mean \pm standard deviation