

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

01. The four most common chemical elements found in living matter are
☐ (1) C, H, O and P
☐ (2) C, H, O and N
☐ (3) C, H, N and P
☐ (4) C, H, O and S
☐ (5) C, H, O and Ca.
02. Which of the following biochemical conversions taking place in living cells is an example of an anabolic reaction?
☐ (1) Conversion of starch to glucose
☐ (2) Conversion of proteins to dipeptides
☐ (3) Conversion of amino acids to proteins
☐ (4) Conversion of fats to fatty acids
☐ (5) Conversion of glucose to carbon dioxide and water
03. Which of the following statements is correct regarding photosynthesis?
☐ (1) Oxygen is produced in photo system II of the light reaction
☐ (2) Carbon dioxide is fixed in the grana of the chloroplast
☐ (3) ATP is produced in the photo system I of the light reaction
☐ (4) NADPH and H^+ are produced during photo system II of the light reaction
☐ (5) Light reaction takes place in the stroma of the chloroplast

Questions No. 04 and 05 are based on the following tests and observations

Test	Solution X	Solution Y
Fehling	brick red precipitate	no colour change
Iodine	dark blue	dark blue
Bauret	no colour change	purple colour

04. Based on the above observations it can be concluded that the solution X contains

- ☐ (1) glucose and starch only.
☐ (2) sucrose and starch only.
☐ (3) starch and reducing sugar only.
☐ (4) glycogen and glucose only
☐ (5) fructose and starch only

05. Based on the above observations it can be concluded that solution Y contains

- ☐ (1) starch and protein only
☐ (2) glucose and Protein only.
☐ (3) amino acids and starch only
☐ (4) sucrose and protein only.
☐ (5) sucrose, starch and protein.

06. Which of the following statements is incorrect regarding ATP?

- ☐ (1) ATP is a nucleotide
☐ (2) ATP is necessary for synthesis of macromolecules
☐ (3) ATP is necessary for converting glucose to pyruvic acid in glycolysis
☐ (4) ATP contains three high energy phosphate bonds
☐ (5) Aerobic respiration yields more ATP than fermentation

07. An adult animal collected from a fresh water pond possessed the following features.

- ☐ (A) Gills (B) Two eyes
☐ (C) Walking legs (D) Dorsoventrally flattened body

To which one of the following classes would this animal most likely belong?

- ☐ (1) Polychaeta (2) Insecta (3) Crustacea
☐ (4) Amphibia (5) Hirudinea

08. Which of the following organisms have been living on earth for the longest period with very little change?

- ☐ (1) Chimpanzees (2) Crows
☐ (3) Grasses (4) Whales
☐ (5) Lamp shells

09. Which of the following combinations of phylum and character is incorrect?

Phylum	Character
(1) Pterophyta	Presence of stoma
(2) Bryophyta	Presence of roots
(3) Cycadophyta	Presence of megasporophylls
(4) Mollusca	Presence of a ventral foot
(5) Echinodermata	Presence of an endoskeleton

10. Flagship species are the species that

- ☐ (1) are confined to a certain country or region
☐ (2) are listed in the IUCN red data book.
☐ (3) are represented in the national flags of the countries
☐ (4) have a symbolic value in the culture of a country
☐ (5) are protected by law.

11. Sexual reproduction of *Mucor* consists of the following stages

- ☐ (I) Development of zygospore
☐ (II) Two hyphae of different strains contact with to each other
☐ (III) Formation of gametangia
☐ (IV) Fusion of nuclei
☐ (V) Germination of zygospore

Which of the following represents the correct order of stages in sexual reproduction of *Mucor*?

- ☐ (1) III, IV, II, V, I (2) II, III, IV, I, V
☐ (3) I, II, III, IV, V (4) II, IV, III, I, V
☐ (5) III, IV, I, II, V

12. Which of the following comparisons on taxis and tropism is incorrect?

	Taxis	Tropism
(1)	Shown by some unicellular organisms	Shown by higher plants and some fungi
(2)	Stimulus general or diffuse	Stimulus unilateral
(3)	Response towards or away from stimulus	Response towards the stimulus only
(4)	Whole organism moves	Only part of the plant moves
(5)	Not a growth movement	Always a growth movement

13. Which of the following regions of the visible spectrum of light is most productive for photosynthesis?

- (1) Red and violet
- (2) Red and green
- (3) Green and blue
- (4) Blue and violet
- (5) Red and blue

14. Which of the following substances is mainly transported in the phloem?

- (1) Gases
- (2) Water
- (3) Synthesized food
- (4) Mineral salts
- (5) Nitrogenous wastes

15. Which of the following elements are necessary for the formation of chlorophyll?

- (1) sulphur, nitrogen and iron
- (2) sulphur, magnesium and iron
- (3) sulphur, nitrogen and magnesium
- (4) sulphur, nitrogen, magnesium and iron
- (5) magnesium, nitrogen and iron

16. Which of the following character is **absent** in the life cycle of angiosperms?

- (1) Alternation of generation of haploid and diploid generations
- (2) Development of microspores and megaspores
- (3) Dominant sporophytic generation
- (4) Reduced gametophytic generation
- (5) Meiosis during gamete formation

17. Parthenocarpy occurs very commonly in nature in

- (1) grapes.
- (2) orange.
- (3) pineapple
- (4) mangosteen.
- (5) guava.

18. In *Pogonatum*

- (1) the sporophyte is totally dependent on the gametophyte.
- (2) the gametophyte is dioecious.
- (3) two kinds of spores are produced
- (4) male gametes are bi flagellated
- (5) spores develop within the sporangium before they are released

19. Which of the following statements regarding the human skin is **incorrect**?

- (1) All four basic types of tissues are present in it.
- (2) It synthesises vitamin A.
- (3) It functions as an excretory organ.
- (4) It prevents the entry of micro organisms into the body.
- (5) It helps in thermoregulation

20. A student when examining an animal tissue under the light microscope observed that its cells are lying on a basement membrane. Which one of the following is most likely to be present in this tissue?

- (1) Red blood corpuscles
- (2) Collagen fibres
- (3) Large matrix
- (4) Yellow fibres
- (5) Cilia

21. When examining a dissection of an earthworm displayed by the teacher, a student observed that the hearts

- (1) were located in the middle region of the body
- (2) were ventral to the alimentary canal
- (3) possessed ostia
- (4) were paired.
- (5) were bathed in blood in the haemocoel

22. Which of the following statements is true regarding a normal healthy fully grown male foetus?

- (1) All skull bones are completely hardened.
- (2) Nails have developed upto the tips of the fingers.
- (3) Eye lids are not separated from each other
- (4) Body is covered with a dense layer of hair
- (5) Scrotum is not developed.

23. Which of the following statements is **correct** regarding both a cardiac muscle fibre and a smooth muscle fibre?

- (1) They are striated.
- (2) They are spindle shaped.
- (3) They never become fatigued.
- (4) They are myogenic
- (5) They are under involuntary control

24. Deficiency of which one of the following hormones can cause diabetes insipidus?

- (1) Insulin
- (2) Aldosterone
- (3) ADH
- (4) Noradrenaline
- (5) Glucagon

25. In man, which of the following hormones is **not** synthesized in the pituitary gland?

- (1) Prolactin
- (2) Growth hormone
- (3) Thyroid stimulating hormone
- (4) Oxytocin
- (5) Luteinizing hormone

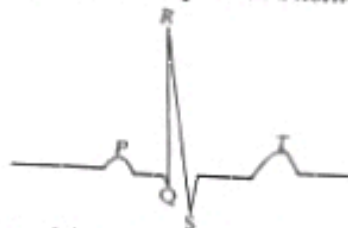
26. Which of the following statements is **incorrect** regarding human saliva?

- (1) It is a mixture of the secretions of salivary glands and oral mucous glands
- (2) It helps to reduce dental caries.
- (3) Ptyalin is present in saliva.
- (4) It has a bactericidal action.
- (5) It is alkaline.

27. Which of the following respiratory structures is not in contact with blood?

- (1) External gills (2) Internal gills (3) Tracheae
(4) Book lungs (5) Lungs

28. The diagram given below represents a normal ECG tracing



Contraction of the auricles is represented by

- (1) P (2) Q (3) R (4) S (5) T

29. If a child of blood group O was born to a father of blood group A and a mother of blood group B, which of the following combination gives the genotypes of father and mother?

Father	Mother
(1) $I^A I^A$	$I^B I^B$
(2) $I^A I^B$	$I^A I^B$
(3) $I^A I^B$	$I^B i$
(4) $I^A i$	$I^B i$
(5) $I^A i$	$I^A I^B$

30. Which of the following statements is **not** true regarding meiosis?

- (1) Meiosis takes place during gametogenesis
(2) The daughter cells have only half the chromosome number of the mother cell.
(3) During the development of the embryo the cells multiply by mean of meiosis
(4) Meiosis leads to variations in the offspring
(5) Four daughter cells are produced from one mother cell during meiosis

31. Crossing of two pink flowered plants resulted in red flowered, pink flowered and white flowered plants at 1 : 2 : 1 ratio. The most likely reason for this result is

- (1) epistasis. (2) incomplete dominance.
(3) mutations. (4) polyallelic inheritance
(5) polygenic inheritance.

32. Dimple is a double recessive Mendelian character that occurs in humans. If 2.25% of a certain population possesses this character, the percentage of heterozygotes for this character in this population is

- (1) 97.75 %. (2) 85.00 %. (3) 74.50%
(4) 72.25 %. (5) 25.50%

33. Parallel evolution is

- (1) Evolution of anatomical features as adaptations to new environments
(2) Evolution of characters that prevent interbreeding among the members of a population
(3) Evolution of specialized characters in closely related species
(4) Evolution of similar characters in species that have different ancestors
(5) Evolution of complex organ systems in closely related species

34. Auxins

- (1) Stimulate cell division at the stem apex
(2) Stimulate root formation in stem cuttings
(3) Stimulate lateral bud development
(4) Stimulate fruit ripening
(5) Stimulate breaking of dormancy in seeds

35. Which of the following statements best explains the Gaia concept?

- (1) Biosphere is the largest ecosystem on earth
(2) The environment is an integrated functional system
(3) The living and non-living components of the biosphere interact with each other
(4) The link between the living and non living components of the biosphere is the biogeochemical cycles
(5) The earth is a living entity

36. In all ecosystems

- (1) the highest biomass is found at the primary consumer level.
(2) animal and plant material are broken down into reusable end products
(3) the largest number of organisms are found at the primary producer level.
(4) the highest amount of energy is stored in the highest trophic level.
(5) decomposers play a significant role in the cycling of energy.

37. The convention known as CITES deals with the

- (1) emission of ozone depleting substances
(2) trading of endangered animals and plants
(3) conservation of wetlands.
(4) minimizing the greenhouse effect.
(5) protection of endemic species.

38. Which of the following statements on air pollution is correct?

- (1) Emission of carbon dioxide into the atmosphere has significantly contributed to the depletion of ozone layer.
(2) Methane produced in animal husbandry activities contributes to global warming.
(3) Oxides of carbon are the major contributors for acid rain in industrialized countries.
(4) Carbon monoxide and smoke from the vehicle exhausts do not still contribute significantly to air pollution in the cities.
(5) Destruction of the ozone layer results in an increase in the amount of infra red radiation in the atmosphere

39. Which of the following statements is **incorrect** regarding bioremediation?

- "Bioremediation is currently used to
(1) decrease the level of organic pollutants in aquatic environments
(2) accelerate decomposition of waste in waste water treatment plants of the food industry.
(3) remove oil spills from aquatic environments.
(4) treat gastro-intestinal disorders of humans.
(5) remove toxic metals such as chromium in metal industry waste

40. Which of the following eye piece × objective combination in a light microscope would enable you to see a minimum number of yeast cells in a sample of toddy?
- (1) 5 × 40 (2) 5 × 100 (3) 10 × 10
(4) 10 × 40 (5) 10 × 100

41. Antibacterial activity of penicillin depends on its ability to
- (1) inhibit bacterial protein synthesis.
(2) inhibit bacterial cell wall synthesis
(3) inhibit bacterial DNA synthesis
(4) damage bacterial cell membrane
(5) damage bacterial ribosomes.

42. Which of the following pairs of microorganisms play a major role in the commercial production of vinegar from fruit juice?

- (1) *Saccharomyces* and *Lactobacillus*
(2) *Aspergillus* and *Acetobacter*
(3) *Lactobacillus* and *Acetobacter*
(4) *Saccharomyces* and *Acetobacter*
(5) *Aspergillus* and *Lactobacillus*

43. Which of the following pathogenic bacteria produce a disease mainly through the production of neurotoxins?

- (1) *Corynebacterium diphtheriae*
(2) *Vibrio cholerae*
(3) *Clostridium tetani*
(4) *Salmonella typhi*
(5) *Staphylococcus aureus*

44. Which of the following statements is incorrect regarding biopesticides?

- (1) They are environmentally friendly
(2) They are biodegradable
(3) Their toxins do not accumulate along food chains.
(4) Pests do not generally develop resistance against biopesticides.
(5) Only bacteria are used as biopesticides.

45. Aquaculture of which one of the following species had contributed to large amount of foreign exchange earnings in, Sri Lanka in the recent past?

- (1) *Oreochromis mossambicus*
(2) *Penaeus monodon*
(3) *Labeo rohita*
(4) *Catla catla*
(5) *Oreochromis niloticus*

46. Which of the following statements is true regarding intensive aquaculture?

- (1) Stocking density is lower than in semi-intensive aquaculture.
(2) Tilapias are among the major species used for intensive aquaculture in Sri Lanka.
(3) Gill nets are the major fishing gear used in harvesting
(4) Supplementary feeding is carried out only if the growth of Cultured organisms is low.
(5) Yield per unit area is higher than that of extensive aquaculture

47. This question is based on the following insect pests of coconut
- (A) Red weevil (B) Black beetle
(C) Coconut leaf miner (D) Coconut caterpillar

Which of the above pests belong to order coleoptera and cause damage to coconut palm during the larval stage?

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

48. Which of the following statements on *Necator americanus* is true?

- (1) It feeds on partly digested food in the small intestine of man
(2) Its infections can be controlled by destroying the breeding sites of mosquitos
(3) Larvae are related into the external environment with the faeces of the infected persons
(4) Larvae passes through the heart of the infected person during the life cycle.
(5) Its infections are usually identified by examining a blood sample for the presence of larvae.

49. The observed frequencies of four phenotypes of the F_2 generation obtained in a dihybrid cross were 24, 12, 9 and 3. A student carried out a chi-square test to determine whether these frequencies conform to the 9 : 3 : 3 : 1 ratio. The chi-square value he calculated was
- (1) 0.00 (2) 0.38 (3) 1.33
(4) 11.00 (5) 48.00

50. The percentage of a normally distributed population that takes values greater than the value of mean + 2 standard deviation is approximately

- (1) 95.0% (2) 68.0% (3) 32.0%
(4) 5.0 % (5) 2.5%

- 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 statement / statements is / are correct?

- (A) All viruses are obligate parasites,
(B) All viruses contain DNA and RNA.
(C) Some viruses contain enzymes.
(D) Most viruses that infect plants have RNA
(E) All viruses can be cultivated in live chick embryos

52. Which of the following of food preservation method/ methods is/are used in the production of powdered milk?
- (A) Radiation
 - (B) Membrane filtration
 - (C) Dehydration
 - (D) Asepsis
 - (E) Addition of sugar.
53. When a person travels from north to the equator of the earth, some of the biomes he would be able to observe in correct order are
- (A) taigas, tundras, deciduous forests, rain forests.
 - (B) deciduous forests, taigas, rain forests, deserts.
 - (C) tundras, taigas, deciduous forests, rain forests
 - (D) taigas, deciduous forests, deserts, tropical grasslands.
 - (E) tundras, temperate grasslands, taigas, deserts
54. Which of the following resources is/are renewable?
- (A) Forests
 - (B) Soil
 - (C) Oil
 - (D) Fresh water
 - (E) Graphite
55. Which of the following is/are sex linked genetic disorder / disorders of man?
- (A) Down's syndrome
 - (B) Turner's syndrome
 - (C) Red-green colour blindness
 - (D) Haemophilia
 - (E) Clinefelter's syndrome
56. In man, activation of the parasympathetic nervous system
- (A) increases gut movements.
 - (B) relaxes the urinary bladder sphincter.
 - (C) increases sweating
 - (D) constricts pupils
 - (E) dilates bronchioles
57. C_4 type of photosynthesis is more efficient than C_3 type of photosynthesis because in C_4 plants
- (A) Carbon dioxide acceptor is more efficient
 - (B) Photorespiration does not take place
 - (C) Calvin cycle does not take place.
 - (D) Photolysis of water and formation of carbon dioxide take place in different cells.
 - (E) Carbon dioxide absorbed by mesophyll cells are transported to bundle sheath cells
58. Which of the following feature/s found in *Nephrolepis* cannot be found in *Pogonatum*?
- (A) Well developed vascular tissues
 - (B) Independent gametophyte
 - (C) Independent sporophyte
 - (D) haploid spores
 - (E) motile reproductive cells
59. Which of the following taxa include/includes marine organisms?
- (A) Chlorophyta
 - (B) Bryophyta
 - (C) Chondrichthyes
 - (D) Reptilia
 - (E) Lycophta.
60. Which of the following statements regarding extinction of species is / are true?
- (A) Extinction of species is a natural process
 - (B) At far as known today, extinction of dinosaurs was the first major extinction that took place on earth
 - (C) Rate of extinction of species has increased in the last century
 - (D) Extinctions are needed to provide space for new species.
 - (E) Rate of extinction of species is generally higher than the rate of speciation