

**A. Botany**

1. The only snake that builds a nest is: [1995]  
 (a) Chain viper (b) King Cobra  
 (c) Krait (d) Saw-scaled viper
2. Most of the desert plants bloom during night time because [1995]  
 (a) their blooming is controlled by low temperature  
 (b) they are sensitive to the phases of moon  
 (c) the desert insects eat away flowers during day time  
 (d) the desert insects are active during night time
3. Living organisms require at least 27 elements, of which 15 are metals. Among these, those required in major quantities, include [1996]  
 (a) potassium, manganese, molybdenum and calcium  
 (b) potassium, molybdenum, copper and calcium  
 (c) potassium, sodium, magnesium and calcium  
 (d) sodium, magnesium, copper and manganese
4. It is possible to produce seedless tomato fruits by [1996]  
 (a) applying trace elements in tomato fruits  
 (b) spraying mineral solution on plants  
 (c) spraying hormones on flowers  
 (d) applying fertilizers containing radioactive elements
5. Match List-I (Physiological processes) with List-II (Cell organelles) and select the correct answer by using the codes given below: [1996]
 

List-I	List-II
A. Photosynthesis	1. Plasma membrane
B. Mineral uptake	2. Chloroplast
C. Respiration	3. Mitochondria
D. Protein synthesis	4. Ribosomes

 (a) A - 1; B - 2; C - 3; D - 4  
 (b) A - 1; B - 2; C - 4; D - 3  
 (c) A - 2; B - 1; C - 3; D - 4  
 (d) A - 2; B - 1; C - 4; D - 2
6. Which one of the following is a modified stem? [1996]  
 (a) Carrot (b) Sweet potato  
 (c) Coconut (d) Potato
7. Which one of the following organisms is likely to show the highest concentration of DDT, once it has been introduced into the ecosystem? [1997]  
 (a) Grasshopper (b) Toad  
 (c) Snake (d) Cattle
8. Match List-I with List-II and select the correct answer by using the codes given below the lists [1998]
 

List-I	List-II
A. Fruit	1. Ovule
B. Seed	2. Leaf
C. Wood	3. Stem
D. Starch	4. Ovary

 (a) A-2; B-1; C-3; D-4  
 (b) A-4; B-1; C-3; D-2  
 (c) A-2; B-3; C-1; D-4  
 (d) A-4; B-3; C-1; D-2
9. Which one of the following statements regarding starch and cellulose is not correct? [1998]  
 (a) Both of them are of plant origin  
 (b) Both of them are polymers  
 (c) Both of them give colour with iodine  
 (d) Both of them are made up of glucose molecules
10. Ergotism is due to consumption of [1998]  
 (a) contaminated grains  
 (b) rotting vegetables  
 (c) contaminated water  
 (d) safe cooked food
11. Which one of the following is a useful functional association between fungi and the roots of higher plants? [1999]  
 (a) Biofertilizer (b) Coralloid root  
 (c) Lichen (d) Mycorrhiza
12. Within biological communities, some species are important in determining the ability of a large number of other species to persist in the community. Such species are called [2000]  
 (a) Keystone species  
 (b) Allopatric species  
 (c) Sympatric species  
 (d) Threatened species
13. Which one of the following organisms can serve as a biofertilizer for rice crop? [2000]  
 (a) Blue-green algae (b) *Rhizobium* sp.  
 (c) Mycorrhizal fungi (d) *Azotobacter* sp.

14. Phytotron is a facility to [2000]  
 (a) grow plants under disease-free conditions  
 (b) conserve endangered species of plants  
 (c) grow plants under controlled conditions  
 (d) induce mutations
15. Soft drinks such as cocoa contain significant quantities of: [2000]  
 (a) caffeine (b) nicotine  
 (c) tannin (d) renin
16. Canola refers to special type of oil seed mustard varieties bred for human consumption. The main characteristic of these varieties is that the [2000]  
 (a) seeds have very high oil content  
 (b) oil is rich in unsaturated fatty acids  
 (c) oil has long shelf-life  
 (d) oil has very low erucic acid content
17. Which organelle in the cell, other than nucleus contains DNA? [2001]  
 (a) Centriole (b) Golgi apparatus  
 (c) Lysosome (d) Mitochondrion
18. "Athlete's Foot" is a disease' caused by [2001]  
 (a) Bacteria (b) Fungus  
 (c) Protozoan (d) Nematode
19. Epiphytes are plants which depend on other plants for [2001]  
 (a) food (b) mechanical support  
 (c) shade (d) water
20. In a bisexual flower, if androecium and gynoecium mature at different times, the phenomenon is known as [2002]  
 (a) dichogamy (b) herkogamy  
 (c) heterogamy (d) monogamy
21. Match List-I (*Indian wild life species*) with List-II (*Scientific names*) and select the correct answer using the codes given below: [2002]
- | List-I<br>(Indian wild life species) | List-II<br>(Scientific names)     |
|--------------------------------------|-----------------------------------|
| A. Asiatic wild ass                  | 1. <i>Boselaphus tragocamelus</i> |
| B. Barasingha                        | 2. <i>Cervus duvauceli</i>        |
| C. Chinkara                          | 3. <i>Equus hemionus</i>          |
| D. Nilgai                            | 4. <i>Gazella gazella</i>         |
- (a) A – 2; B – 3; C – 1; D – 4  
 (b) A – 3; B – 2; C – 4; D – 1  
 (c) A – 2; B – 3; C – 4; D – 1  
 (d) A – 3; B – 2; C – 1; D – 4
22. Which one of the following is monogamous? [2002]  
 (a) Wolf (b) Walrus  
 (c) Seal (d) Deer
23. Consider the following plants [2002]  
 1. *Bougainvillea* 2. Carnations  
 3. *Cocoa* 4. Grapes  
 Which of these plants are propagated by stem cuttings?  
 (a) 1 and 2 (b) 2, 3 and 4  
 (c) 1, 3 and 4 (d) 1, 2, 3 and 4
24. Consider the following statements: [2003]  
 1. The common blue green algae, *Spirogyra* and *Ulothrix*, are found in both fresh water ponds and oceans.  
 2. The *Chameleon* can look ahead with one eye, and at the same time look behind with another.  
 Which of these statements is/are correct?  
 (a) Only 1 (b) Only 2  
 (c) Both 1 and 2 (d) Neither 1 nor 2
25. **Assertion (A)** : Unsaturated fats are more reactive compared with the saturated fats.  
**Reason (R)** : Unsaturated fats have only single bonds in their structure. [2003]  
 (a) Both A and R are individually true and R is the correct explanation of A  
 (b) Both A and R are individually true but R is not the correct explanation of A  
 (c) A is true but R is false  
 (d) A is false but R is true
26. Consider the following statements: [2003]  
 1. Molasses is a by-product of sugar production process.  
 2. Bagasse obtained in the sugar mills is used as a fuel in the boilers to generate steam for the sugar factories.  
 3. Sugar can only be produced from sugarcane as the raw material.  
 Which of these statements are correct?  
 (a) 1 and 2 (b) 2 and 3  
 (c) 1 and 3 (d) 1, 2 and 3
27. Consider the following statements: [2005]  
 1. Kyoto protocol came into force in the year 2005.  
 2. Kyoto protocol deals primarily with the depletion of the ozone layer.  
 3. Methane as a green house gas is more harmful than carbon dioxide.  
 Which of the statements given above is/are correct?  
 (a) 1 and 2 (b) 1 and 3  
 (c) 1 only (d) 3 only
28. **Assertion (A)**: Cellulose is used in making shatter-proof glass. [2006]  
**Reason (R)** : Polysaccharides are not soluble in water.  
**Codes:**  
 (a) Both 'A' and 'R' are individually true and 'R' is the correct explanation of 'A'.  
 (b) Both 'A' and 'R' are individually true but 'R' is not the correct explanation of 'A'.  
 (c) 'A' is true but 'R' is false.  
 (d) 'A' is false but 'R' is true.
29. Which one of the following parts of the pitcher plant becomes modified into a pitcher? [2007]  
 (a) Stem (b) Leaf  
 (c) Stipule (d) Petiole
30. Which of the following types of light are strongly absorbed by plants? [2007]  
 (a) Violet and orange (b) Blue and red  
 (c) Indigo and yellow (d) Yellow and violet

31. Consider the following [2008]  
 1. Rice fields 2. Coal mining  
 3. Domestic animals 4. Wet lands  
 Which of the above are sources of methane, a major greenhouse gas?  
 (a) 1 and 4 only (b) 2 and 3 only  
 (c) 1, 2 and 3 only (d) 1, 2, 3 and 4
32. Which one of the following is an insectivorous plant? [2008]  
 (a) Passion flower plant  
 (b) Pitcher plant  
 (c) Night queen  
 (d) Flame of the forest
33. Consider the following statements about probiotic food: [2008]  
 1. Probiotic food contains live bacteria which are considered beneficial to humans.  
 2. Probiotic food helps in maintaining gut flora.  
 Which of the statements given above is/are correct?  
 (a) 1 only (b) 2 only  
 (c) Both 1 and 2 (d) Neither 1 nor 2
34. Consider the following statements: [2009]  
 1. Sweet orange plant is propagated by grafting technique.  
 2. Jasmine plant is propagated by layering technique. Which of the statements given above is/are correct?  
 (a) 1 only (b) 2 only  
 (c) Both 1 and 2 (d) Neither 1 nor 2
35. In making the saffron spice, which one of the following parts of the plant is used? [2009]  
 (a) Leaf (b) Petal  
 (c) Sepal (d) Stigma
36. Due to their extensive rice cultivation, some regions may be contributing to global warming. To what possible reason/reasons is this attributable? [2010]  
 1. The anaerobic conditions associated with rice cultivation cause the emission of methane.  
 2. When nitrogen based fertilizers are used, nitrous oxide is emitted from the cultivated soil.  
 Which of the statements given above is / are correct?  
 (a) 1 only (b) 2 only  
 (c) Both 1 and 2 (d) Neither 1 nor 2
37. Given below are the names of four energy crops. Which one of them can be cultivated for ethanol? [2010]  
 (a) *Jatropha* (b) Maize  
 (c) *Pongamia* (d) Sunflower
38. Consider the following pairs: [2010]
- | Protected area                     | Well-known for         |
|------------------------------------|------------------------|
| 1. Bhitarkanika, Orissa            | — Salt Water Crocodile |
| 2. Desert National Park, Rajasthan | — Great Indian Bustard |
| 3. Eravikulam, Kerala              | — Hoolak Gibbon        |
- Which of the pairs given above is / are correctly matched?
- (a) 1 only (b) 1 and 2 only  
 (c) 2 only (d) 1, 2 and 3
39. Some species of plants are insectivorous. Why? [2010]  
 (a) Their growth in shady and dark places does not allow them to undertake sufficient photosynthesis and thus they depend on insects for nutrition.  
 (b) They are adapted to grow in nitrogen deficient soils and thus depend on insects for sufficient nitrogenous nutrition.  
 (c) They cannot synthesize certain vitamins themselves and depend on the insects digested by them.  
 (d) They have remained in that particular stage of evolution as living fossils, a link between autotrophs and heterotrophs.
40. Mon 863 is a variety of maize. It was in the news for the following reason. [2010]  
 (a) It is genetically modified dwarf variety which is resistant to drought  
 (b) It is a genetically modified variety which is pest resistant  
 (c) It is a genetically modified variety with ten times higher protein content than regular maize crop  
 (d) It is a genetically modified variety used exclusively for bio-fuel production
41. Though coffee and tea both are cultivated on hill slopes, there is some difference between them regarding their cultivation. In this context, consider the following statements: [2010]  
 1. Coffee plant requires a hot and humid climate of tropical areas whereas tea can be cultivated in both tropical and subtropical areas.  
 2. Coffee is propagated by seeds but tea is propagated by stem cuttings only.  
 Which of the statements given above is /are correct?  
 (a) 1 only (b) 2 only  
 (c) 1 and 2 (d) Neither 1 nor 2
42. Consider the following statements: [2010]  
 1. Biodiversity hotspots are located only in tropical regions.  
 2. India has four biodiversity hotspots i.e., Eastern Himalayas, Western Himalayas, Western Ghats and Andaman and Nicobar Islands.  
 Which of the statements given above is / are correct?  
 (a) 1 only (b) 2 only  
 (c) Both 1 and 2 (d) Neither 1 nor 2
43. Consider the following statements: [2010]  
 1. The boundaries of a National Park are defined by legislation.  
 2. A Biosphere Reserve is declared to conserve a few specific species of flora and fauna.  
 3. In a Wildlife Sanctuary, limited biotic interference is permitted.  
 Which of the statements given above is / correct?  
 (a) 1 only (b) 2 and 3 only  
 (c) 1 and 3 only (d) 1, 2 and 3

44. A pesticide which is a chlorinated hydrocarbon is sprayed on a food crop. The food chain is : Food crop – Rat – Snake – Hawk. In this food chain, the highest concentration of the pesticide would accumulate in which one of the following? [2010]  
 (a) Food crop (b) Rat  
 (c) Snake (d) Hawk
45. With reference to soil conservation, consider the following practices : [2010]  
 1. Crop rotation 2. Sand fences  
 3. Terracing 4. Wind breaks  
 Which of the above are considered appropriate methods for soil conservation in India.  
 (a) 1, 2, and 3 only (b) 2 and 4 only  
 (c) 1, 3 and 4 only (d) 1, 2, 3 and 4
46. Other than *Jatropha curcas*, why is *Pongamia pinnata* also considered a good option for the production of bio-diesel in India? [2010]  
 1. *Pongamia pinnata* grows naturally in most of the arid regions of India.  
 2. The seeds of *Pongamia pinnata* are rich in lipid content of which nearly half is oleic acid.  
 Which of the statements given above is/ are correct?  
 (a) 1 only (b) 2 only  
 (c) Both 1 and 2 (d) Neither 1 nor 2
47. When the bark of a tree is removed in a circular fashion all around near its base, it gradually dries up and dies because? [2011 - I]  
 (a) Water from soil cannot rise to aerial parts.  
 (b) Roots are starved of energy.  
 (c) Tree is infected by soil microbes.  
 (d) Roots do not receive oxygen for respiration.
48. Other than resistance to pests, what are the prospects for which genetically engineered plants have been created? [2012 - I]  
 1. To enable them to withstand drought  
 2. To increase the nutritive value of the produce  
 3. To enable them to grow and do photosynthesis in spaceships and space stations  
 4. To increase their shelf life  
 Select the correct answer using the codes given below :  
 (a) 1 and 2 only (b) 3 and 4 only  
 (c) 1, 2 and 4 only (d) 1, 2, 3 and 4
49. Consider the following organisms: [2013 - I]  
 1. Agaricus  
 2. Nostoc  
 3. Spirogyra  
 Which of the above is/are used as biofertilizer / biofertilizers?  
 (a) 1 and 2 (b) 2 only  
 (c) 2 and 3 (d) 3 only
50. Fruits stored in a cold chamber exhibit longer storage life because [2013 - I]  
 (a) exposure to sunlight is prevented  
 (b) concentration of carbon dioxide in the environment is increased  
 (c) rate of respiration is decreased  
 (d) there is an increase in humidity
51. Many transplanted seedling do not grow because [2013 - I]  
 (a) the new soil does not contain favourable minerals  
 (b) most of the root hair grip the new soil too hard  
 (c) most of the root hairs are lost during transplantation  
 (d) leaves get damaged during transplantation
52. Which of the following leaf modifications occurs/occur in desert areas to inhibit water loss? [2013 - I]  
 1. Hard and waxy leaves  
 2. Tiny leaves or no leaves  
 3. Thorns instead of leaves  
 Select the correct answer using the codes given below.  
 (a) 1 and 2 only (b) 2 only  
 (c) 1 and 3 only (d) 1, 2 and 3
53. Mycorrhizal biotechnology has been used in rehabilitating degraded sites because mycorrhiza enables the plants to [2013 - I]  
 1. resist drought and increase absorptive area  
 2. tolerate extremes of pH  
 3. resist disease infestation  
 Select the correct answer using the codes given below.  
 (a) 1 only (b) 2 and 3 only  
 (c) 1 and 3 only (d) 1, 2 and 3

## B. Zoology

54. Which one of the following sets is correctly matched? [1995]  
 (1) Diphtheria, Pneumonia and Leprosy: Hereditary  
 (2) AIDS, Syphilis and Gonorrhoea: Bacterial  
 (3) Colour blindness, Haemophilia and Sickle cell anaemia: Sex linked  
 (4) Polio, Japanese B encephalitis and Plague: Viral  
 (a) only 2 (b) only 3  
 (c) 1 and 4 (d) None of these
55. A person with 'AB' blood group is sometimes called a universal recipient because of the [1995]  
 (a) lack of antigen in his blood  
 (b) lack of antibodies in his blood  
 (c) lack of both antigens and antibodies in his blood  
 (d) presence of antibodies in his blood
56. Which one of the following is a membrane that protects the developing embryo from desiccation? [1995]  
 (a) Amnion (b) Allantois  
 (c) Chorion (d) Yolk sac
57. Which one of the following antimicrobial drugs, is suitable for treatment of both tuberculosis and leprosy? [1995]  
 (a) Isoniazid (b) P-aminosalicylic acid  
 (c) Streptomycin (d) Rifampicin
58. The normal temperature of human on Kelvin scale is [1995]  
 (a) 280 (b) 290  
 (c) 300 (d) 310



59. Which of the following elements are present in all proteins? [1995]  
 1. Carbon                      2. Hydrogen  
 3. Oxygen                      4. Nitrogen  
**Codes :**  
 (a) 2 and 3                      (b) 1, 2 and 4  
 (c) 1, 3 and 4                      (d) 1, 2, 3 and 4
60. Which one of the following hormones contains iodine? [1995]  
 (a) Thyroxine                      (b) Testosterone  
 (c) Insulin                      (d) Adrenaline
61. By Weaving threads of physics, chemistry and biology into a rich tapestry, this remarkable scientist provided a unifying molecular view of the world. He touted the wonderful properties of Vitamin C, first as a cure of common cold and later as preventing agent against cancer." One of science's major figures of all time referred to above is [1995]  
 (a) G. N. Lewis                      (b) Linus Carl Pauling  
 (c) Fritz London                      (d) Walter Heitle
62. "It begins as a single cell and grows into a merciless disease that claims millions of lives year after year. But scientists are steadily unlocking its mysteries and the fight against it, may now have reached a dramatic turning point. New discoveries promise better therapies and hope in the war against....". The disease referred to in the above quotation is [1995]  
 (a) Cancer                      (b) AIDS  
 (c) Tuberculosis                      (d) Alzheimer's disease
63. Of the four landmarks in medical history given below, which one was the first to take place? [1996]  
 (a) Organ transplant                      (b) Bypass surgery  
 (c) Test tube baby                      (d) Plastic surgery
64. According to the World Health Organisation (WHO), the disease which causes the death of the largest number of people today is [1996]  
 (a) AIDS                      (b) Tuberculosis  
 (c) Malaria                      (d) Ebola
65. The nutritional deficiency condition that needs to be given top priority for remedial action in India today is [1996]  
 (a) Scurvy                      (b) Rickets  
 (c) Xerophthalmia                      (d) Pellagra
66. Match List-I with List-II and select the correct answer by using the codes given below: [1996]
- | List-I     | List-II         |
|------------|-----------------|
| A. Vitamin | 1. Pepsin       |
| B. Enzyme  | 2. Carotene     |
| C. Hormone | 3. Keratin      |
| D. Protein | 4. Progesterone |
- Codes:**  
 (a) A - 1; B - 2; C - 3; D - 4  
 (b) A - 2; B - 1; C - 4; D - 3  
 (c) A - 2; B - 1; C - 3; D - 4  
 (d) A - 1; B - 2; C - 4; D - 3
67. Which of the following are associated with *Diabetes mellitus*, a common disease in adults? [1996]  
 1. Higher sugar level in blood  
 2. Lower sugar level in blood  
 3. Lower insulin level in blood  
 4. Higher insulin level in blood  
 Select the correct answer by using the codes given below:  
**Codes:**  
 (a) 2 and 4                      (b) 1 and 2  
 (c) 2 and 3                      (d) 1 and 3
68. Consider the following statements. [1996]  
 AIDS -is transmitted  
 1. By sexual intercourse  
 2. By blood transfusion  
 3. By mosquitoes and other blood sucking insects  
 4. Across the placenta  
 (a) 1, 2 and 3 are correct  
 (b) 1, 2 and 4 are correct  
 (c) 1, 3 and 4 are correct  
 (d) 1 and 3 are correct
69. Which of the following would lead to malnutrition? [1996]  
 1. Overnutrition  
 2. Undernutrition  
 3. Imbalanced nutrition  
 Select the correct answer by using the codes given below  
**Codes:**  
 (a) 2 alone                      (b) 2 and 3  
 (c) 1 and 3                      (d) 1, 2 and 3
70. People drinking water from a shallow hand pump, are likely to suffer from all of the following diseases except [1996]  
 (a) Cholera                      (b) Typhoid  
 (c) Jaundice                      (d) Fluorosis
71. Besides proteins and carbohydrates, other elements of nutritional value found in milk, include [1996]  
 (a) calcium, potassium and iron  
 (b) calcium and potassium  
 (c) potassium and iron  
 (d) calcium and iron
72. Fat present below the skin surface in our body, acts as a barrier against [1996]  
 (a) Loss of heat from the body  
 (b) Loss of essential body fluids  
 (c) Loss of salts from the body  
 (d) Entry of harmful micro-organisms from the environment
73. The major chemical compound found in kidney stones is : [1996]  
 (a) urea  
 (b) calcium carbonate  
 (c) calcium oxalate  
 (d) calcium sulphate

74. The pituitary gland by virtue of its tropic hormones controls the secretory activity of other endocrine glands. Which one of the following endocrine gland can function independent of the pituitary gland? [1997]
- (a) Thyroid (b) Gonads  
(c) Adrenals (d) Parathyroid
75. Oxygen transportation in a human body takes place through [1997]
1. Blood 2. Lungs  
3. Tissue
- The correct sequence of transportation is  
(a) 1, 2, 3 (b) 3, 1, 2  
(c) 2, 1, 3 (d) 1, 3, 2
76. Corpus luteum is a mass of cells found in [1997]
- (a) Brain (b) Ovary  
(c) Pancreas (d) Spleen
77. Alpha-keratin is a protein, present in [1997]
- (a) Blood (b) Skin  
(c) Lymph (d) Eggs
78. What is the average fat content of buffalo milk? [1997]
- (a) 7.2% (b) 4.5%  
(c) 9.0% (d) 10.0%
79. The major component of honey is [1997]
- (a) glucose (b) sucrose  
(c) maltose (d) fructose
80. Arteries supplying blood to the heart are called [1997]
- (a) Carotid arteries (b) Hepatic arteries  
(c) Coronary arteries (d) Pulmonary arteries
81. Daily intake of proteins, recommended for a moderately active woman is [1997]
- (a) 30 g (b) 37 g  
(c) 40 g (d) 46 g
82. Match List-I with List-II and select the correct answer by using the codes given below: [1997]
- | List-I          | List-II        |
|-----------------|----------------|
| A. Malaria      | 1. Bone marrow |
| B. Filariasis   | 2. Brain       |
| C. Encephalitis | 3. Muscle      |
| D. Leukaemia    | 4. Lymph node  |
|                 | 5. Blood cells |
- (a) A – 5; B – 3; C – 2; D – 1  
(b) A – 5; B – 4; C – 2; D – 1  
(c) A – 4; B – 3; C – 5; D – 1  
(d) A – 5; B – 4; C – 1; D – 2
83. Antigen is a substance which [1997]
- (a) lowers body temperatures  
(b) destroys harmful bacteria  
(c) triggers the immune system  
(d) is used as an antidote to poison
84. The sequencing of the entire genome (the totality of all genes) of an organism was completed in 1996. The organism was: [1997]
- (a) albino mouse (b) yeast  
(c) human being (d) plasmodium vivax
85. Examine the following three statements: [1998]
1. Processed meat is a perishable food
  2. All perishable foods are packed in sealed tins
  3. Sealed tins sometimes do not contain processed meat
- Which one of the following inferences can be drawn from the above statements?
- (a) Sealed tins always contain perishable food  
(b) Processed meat is sometimes not packed in sealed tins  
(c) Processed meat is always packed in sealed tins  
(d) Non-perishable foods are never packed in sealed tins
86. Which one of the following type of micro organisms is most widely used in industries? [1998]
- (a) Bacteria  
(b) Bacteria and fungi  
(c) Bacteria and algae  
(d) Bacteria, microalgae and fungi
87. Match List-I with List-II and select the correct answer using the codes given below the lists: [1998]
- | List-I                            | List-II             |
|-----------------------------------|---------------------|
| A. Theory of mutation             | 1. Beadle and Tatum |
| B. Theory of evolution            | 2. Jacob and Monod  |
| C. One gene one enzyme hypothesis | 3. Darwin           |
| D. Operon concept                 | 4. de Vries         |
- Codes :**  
(a) A – 3; B – 4; C – 1; D – 2  
(b) A – 4; B – 3; C – 1; D – 2  
(c) A – 4; B – 3; C – 2; D – 1  
(d) A – 3; B – 4; C – 2; D – 1
88. A tree species in Mauritius failed to reproduce because of the extinction of a fruit-eating bird. Which one of the following was that bird? [1998]
- (a) Dove (b) Dodo  
(c) Condor (d) Skua
89. The complete conversion of glucose, in the presence of oxygen, into carbon dioxide and water with release of energy is called [1998]
- (a) aerobic respiration  
(b) anaerobic respiration  
(c) glycolysis  
(d) hydrolysis
90. Consumption of fish is considered to be healthy when compared to flesh of other animals because fish contains [1998]
- (a) polyunsaturated fatty acids  
(b) saturated fatty acids  
(c) essential vitamins  
(d) more carbohydrates and proteins

91. Match List-I with List-II and select the answer using the codes given below: [1998]

List-I (Disease)	List-II (Organism)
---------------------	-----------------------

- |                  |              |
|------------------|--------------|
| A. Malaria       | 1. Fungi     |
| B. Poliomyelitis | 2. Bacteria  |
| C. Tuberculosis  | 3. Virus     |
| D. Ringworm      | 4. Protozoan |
- (a) A-4; B-3; C-2; D-1 (b) A-4; B-3; C-1; D-2  
(c) A-3; B-4; C-1; D-2 (d) A-3; B-4; C-2; D-1
92. Haemophilia is a genetic disorder which leads to [1998]
- (a) decrease in haemoglobin level  
(b) rheumatic heart disease  
(c) decrease in WBC  
(d) non-clotting of blood
93. Endoscopy, a technique used to explore the stomach or other inner parts of the body is based on the phenomenon of [1999]
- (a) total internal reflection  
(b) interference  
(c) diffraction  
(d) polarization
94. When ants bite, they inject [1999]
- (a) glacial acetic acid (b) methanol  
(c) formic acid (d) stearic acid
95. In eye donation, which one of the following parts of donor's eye is utilized? [1999, 2001]
- (a) Iris (b) Lens  
(c) Cornea (d) Retina
96. Match the hormones in List-I with items in List-II and select the correct answer using the codes given below: [1999]

List-I	List-II
--------	---------

- |               |   |
|---------------|---|
| A. Adrenaline | 1. Anger, fear, danger                        |
| B. Estrogen   | 2. Attracting partners through sense of smell |
| C. Insulin    | 3. Females                                    |
| D. Pheromones | 4. Glucose                                    |
- (a) A-3; B-1; C-4; D-2  
(b) A-1; B-3; C-2; D-4  
(c) A-1; B-3; C-4; D-2  
(d) A-3; B-1; C-2; D-4
97. Match List-I (Drugs/Chemicals) with List-II (Their uses) and select the correct answer using the codes given below [1999]

List-I	List-II
--------	---------

- |                   |                      |
|-------------------|----------------------|
| A. Atropine       | 1. Local anaesthesia |
| B. Ether          | 2. Heart trouble     |
| C. Nitroglycerine | 3. Dilation of pupil |
| D. Pyrethrin      | 4. Mosquito control  |

**Codes :**

- (a) A-1; B-3; C-2; D-4  
(b) A-1; B-3; C-4; D-2  
(c) A-3; B-1; C-4; D-2  
(d) A-3; B-1; C-2; D-4

98. Which one of the following genetic diseases is sex-linked? [1999]

- (a) Royal haemophilia  
(b) Tay-Sachs disease  
(c) Cystic fibrosis  
(d) Hypertension

99. Lathyrism is caused by excessive consumption of [1999]

- (a) khesari dal  
(b) mustard oil  
(c) polished rice  
(d) mushrooms

100. **Assertion (A) :** In human being, the females play a major role in determining the sex of the offspring.

**Reason (R) :** Women have two 'X' chromosomes. [2000]

**Codes :**

- (a) Both A and R are true and R is the correct explanation of A  
(b) Both A and R are true but R is not a correct explanation of A  
(c) A is true but R is false  
(d) A is false but R is true

101. At which stage in its life cycle, does the silk worm yield the fibre of commerce? [2000]

- (a) Egg (b) Larva  
(c) Pupa (d) Imago

102. Match List-I (Disease) with List-II (Types of disease) and select the correct answer using the codes given below: [2000]

List-I	List-II
--------	---------

- |                |                       |
|----------------|-----------------------|
| A. Haemophilia | 1. Deficiency disease |
| B. Diabetes    | 2. Genetic disease    |
| C. Rickets     | 3. Hormonal disorder  |
| D. Ringworm    | 4. Fungal infection   |
- (a) A-2; B-3; C-4; D-1  
(b) A-2; B-3; C-1; D-4  
(c) A-3; B-2; C-1; D-4  
(d) A-3; B-2; C-4; D-1
103. The blood glucose level is commonly expressed as [2000]

- (a) mm. of Hg  
(b) milligram per decilitre  
(c) parts per million  
(d) gram (mg/dl) per litre

104. Match List-I (Endocrine glands) with List-II (Hormones secreted) and select the correct answer using the codes given below: [2000]

List-I	List-II
--------	---------

- |              |                    |
|--------------|--------------------|
| A. Gonads    | 1. Insulin         |
| B. Pituitary | 2. Progesterone    |
| C. Pancreas  | 3. Growth hormones |
| D. Adrenal   | 4. Cortisone       |
- (a) A-3; B-2; C-4; D-1  
(b) A-2; B-3; C-4; D-1  
(c) A-2; B-3; C-1; D-4  
(d) A-3; B-2; C-1; D-4

- 105.** The sensation of fatigue in the muscles after prolonged strenuous physical work is caused by [2000]  
 (a) a decrease in the supply of oxygen  
 (b) minor wear and tear of muscle fibres  
 (c) the depletion of glucose  
 (d) the accumulation of lactic acid
- 106.** A small pouch containing silica gel is often found in bottles of medicine in tablet or powder form because silica gel [2000]  
 (a) kills bacteria  
 (b) kills germs and spores  
 (c) absorbs moisture  
 (d) absorbs all gases present inside the bottle
- 107.** A man whose blood group is not known meets with a serious accident and needs blood transfusion immediately. Which one of the blood groups mentioned below and readily available in the hospital will be safe for transfusion? [2001]  
 (a) O, Rh<sup>-</sup> (b) O, Rh<sup>+</sup>  
 (c) AB, Rh<sup>-</sup> (d) AB, Rh<sup>+</sup>
- 108.** "Metastasis" is the process by which [2001]  
 (a) cells divide rapidly under the influence of drugs  
 (b) cancer cells spread through the blood or lymphatic system to other sites or organs  
 (c) the chromosomes in cells nuclei are attached to the spindle before moving to the anaphase poles  
 (d) cancer cells are successfully inhibited to divide any further
- 109.** Match List-I with List-II and select the correct answer using the codes given below the lists [2001]
- | <b>List-I</b><br>(Substance) | <b>List-II</b><br>(Physiological role)                |
|------------------------------|---|
| A. Ptyalin                   | 1. Converts angiotensinogen in blood into angiotensin |
| B. Pepsin                    | 2. Digests starch                                     |
| C. Renin                     | 3. Digests proteins                                   |
| D. Oxytocin                  | 4. Hydrolyses fats                                    |
|                              | 5. Induces contraction of smooth muscles              |
- (a) A - 2; B - 3; C - 1; D - 5  
 (b) A - 3; B - 4; C - 2; D - 5  
 (c) A - 2; B - 3; C - 5; D - 1  
 (d) A - 3; B - 1; C - 2; D - 4
- 110.** Antigen is a substance which [2001]  
 (a) destroys harmful bacteria  
 (b) is used to treat poisoning  
 (c) lowers body temperature  
 (d) stimulates formation of antibody
- 111.** Which of the following cell organelles play the most significant role in protein synthesis? [2001]  
 (a) Lysosome and Centrosome  
 (b) Endoplasmic reticulum and Ribosome  
 (c) Golgi apparatus and Mitochondria  
 (d) Lysosome and Mitochondria
- 112.** The cellular and molecular control of programmed cell death is known as [2001]  
 (a) apoptosis (b) ageing  
 (c) degeneration (d) necrosis
- 113.** Match List-I with List-II and select the correct answer using the codes given below [2001]
- | <b>List-I (Bone)</b> | <b>List-II (Name)</b> |
|----------------------|-----------------------|
| A. Breast-bone       | 1. Clavicle           |
| B. Collar-bone       | 2. Patella            |
| C. Knee-cap          | 3. Scapula            |
| D. Shoulder blade    | 4. Sternum            |
- Codes :**  
 (a) A - 4; B - 1; C - 3; D - 2  
 (b) A - 1; B - 4; C - 3; D - 2  
 (c) A - 1; B - 4; C - 2; D - 3  
 (d) A - 4; B - 1; C - 2; D - 3
- 114.** Consider the following statements [2001]  
 1. Tapeworm is a hermaphrodite.  
 2. Round-worm has separate sexes.  
 3. Filaria is caused by a nematode.  
 4. Guinea-worm is an annelid.  
 Which of these are correct?  
 (a) 1 and 2 (b) 1, 2 and 3  
 (c) 3 and 4 (d) 2, 3 and 4
- 115.** In the context of organic evolution, the loss of limbs in snakes is explained by the phenomenon of [2002]  
 (a) use and disuse of organs  
 (b) adaptation to living in burrows  
 (c) natural selection  
 (d) inheritance of acquired characters
- 116.** When one gene controls two or more different characters simultaneously, the phenomenon is called [2002]  
 (a) apomixis (b) pleiotropy  
 (c) polyploidy (d) polyteny
- 117.** With reference to the human body, consider the following statements: [2002]  
 1. The production of somatotropin goes up when a person exercises.  
 2. Men's testes produce progesterone.  
 3. Women's adrenal glands secrete testosterone.  
 4. Stress causes the adrenals to release very less amount of cortisol than usual.  
 Which of the these statements are correct?  
 (a) 1, 2, 3 and 4 (b) 1, 2 and 3  
 (c) 2, 3 and 4 (d) 1 and 4
- 118.** Foot and Mouth disease in animals, a current epidemic in some parts of the world, is caused by [2002]  
 (a) bacterium (b) fungus  
 (c) protozoan (d) virus
- 119.** Which one of the following statements is not correct? [2002]  
 (a) All echinoderms are viviparous.  
 (b) Roundworm has no circulatory system.  
 (c) In bony fishes, swim bladder is usually present.  
 (d) In cartilaginous fishes, fertilization is internal.



120. Which one of the following statements is correct? [2002]
- Prions are the smallest free-living cells.
  - The cell wall of *Mycoplasma* is made up of amino sugars
  - Viroids consist of single-stranded RNA molecule
  - Rickettsias lack cell wall
121. **Assertion (A)** : Drinking of whisky increases the frequency of urination.  
**Reason (R)** : Alcohol intake speeds up the secretion of vasopressin in the body. [2002]
- Both A and R are true and R is the correct explanation of A
  - Both A and R are true but R is not a correct explanation of A
  - A is true both R is false
  - A is false but R is true
122. **Assertion (A)** : Human diet should compulsorily contains glycine, serine and tyrosine.  
**Reason (R)** : Essential amino acids can not be synthesized in the human body. [2002]
- Both A and R are true and R is the correct explanation of A
  - Both A and R are true but R is not a correct explanation of A
  - A is true both R is false
  - A is false but R is true
123. Among living organisms, which one of the following is the most responsible factor for bringing about the origin of a new species? [2002]
- Isolation
  - Mutation
  - Natural selection
  - Sexual reproduction
124. Ticks and mites are actually [2002]
- Arachnids
  - Crustaceans
  - Insects
  - Myriapods
125. With reference to the blood in a normal person, which one of the following statements is correct? [2002]
- Compared to arteries, veins are less numerous and hold less of the body's blood at any given time
  - Blood cells constitute about 70 percent of the total volume of the blood
  - White blood cells (WBC) are made by lymph nodes only
  - The blood has more platelets than WBC
126. Octopus is [2003]
- an arthropod
  - an echinoderm
  - a hemichordate
  - a mollusc
127. Consider the following conditions of a sick human body [2003]
- Swollen lymph nodes
  - Sweating at night
  - Loss of memory
  - Loss of weight
- Which of these are symptoms of AIDS?
- 1 and 2
  - 2, 3 and 4
  - 1, 3 and 4
  - 1, 2, 3 and 4
128. Consider the following animals of India: [2003]
- Crocodile
  - Elephant
- Which of these is/are endangered species?
- Only 1
  - Only 2
  - Both 1 and 2
  - Neither 1 nor 2
129. With reference to the work of human kidney, consider the following statements [2003]
- After the waste is removed in the kidney, the clean blood is sent back through renal artery.
  - From Bowman's capsule, the filtered liquid passes through tiny tubes where much of the glucose is reabsorbed and sent back to the blood in the renal vein.
- Which of these statements is/are correct?
- Only 1
  - Only 2
  - Both 1 and 2
  - Neither 1 nor 2
130. Which one of the following statements is not correct? [2003]
- Milk contains none of the B-vitamins.
  - Vitamin-A (retinol) deficiency leads to dry and scaly skin.
  - One of the symptoms of scurvy is pain in the joints.
  - Vitamin B<sub>1</sub> (thiamine) deficiency can lead to heart failure.
131. With reference to normal human beings, consider the following statements: [2003]
- In response to the presence of HCl, secretin is produced from the duodenum.
  - Enterogastrone is produced in the small intestine in response to the presence of fatty acids.
- Which of these statements is/are correct?
- Only 1
  - Only 2
  - Both 1 and 2
  - Neither 1 nor 2
132. Consider the following statements: [2004]
- Non-functioning of lachrymal gland is an important symptom of deficiency of Vitamin A.
  - Deficiency of Vitamin B<sub>1</sub> can lead to indigestion and heart enlargement.
  - Vitamin C deficiency can lead to pain in the muscles.
  - Deficiency of Vitamin D causes increased loss of Ca<sup>++</sup> in urine.
- Which of the statements given above are correct?
- 1 and 2
  - 2, 3 and 4
  - 1, 3 and 4
  - 1, 2, 3 and 4
133. The hormone insulin is a [2004]
- glycolipid
  - fatty acid
  - peptide
  - sterol
134. Consider the following statements: [2004]
- Toothless mammals such as *Pangolins* are not found in India.
  - Gibbon* is the only ape found in India.
- Which of the statements given above is/are correct?
- 1 only
  - 2 only
  - Both 1 and 2
  - Neither 1 nor 2

- 135.** In which organ of the human body, lymphocyte cells formed? [2004]  
 (a) Liver (b) Long bone  
 (c) Pancreas (d) Spleen
- 136. Assertion (A) :** Fatty acids should be a part of the balanced human diet.  
**Reason (R) :** The cells of the human body can not synthesize any fatty acids. [2004]  
 (a) Both A and R are individually true and R is the correct explanation of A  
 (b) Both A and R are individually true but R is not the correct explanation of A  
 (c) A is true but R is false  
 (d) A is false but R is true
- 137.** Consider the following statements: [2004]  
 1. Femur is the longest bone in the human body.  
 2. Cholera is a disease caused by bacteria.  
 3. 'Athlete's foot' is a disease caused by virus.  
 Which of the statements given above are correct?  
 (a) 1 and 2 (b) 2 and 3  
 (c) 1 and 3 (d) 1, 2 and 3
- 138.** Consider the following statements: [2005]  
 1. Dengue is a protozoan disease transmitted by mosquitoes.  
 2. Retro-orbital pain is not a symptom of dengue.  
 3. Skin rash and bleeding from nose and gums are some of the symptoms of dengue.  
 Which of the statements given above is/are correct?  
 (a) 1 and 2 (b) 3 only  
 (c) 2 only (d) 1 and 3
- 139.** Which of the following diseases of milching animals are infectious? [2005]  
 1. Foot and mouth disease  
 2. Anthrax  
 3. Black Quarter  
 4. Cowpox  
 Select the correct answer using the codes given below:  
 (a) 1, 2 and 3 (b) 2, 3 and 4  
 (c) 1 and 4 (d) 1, 2, 3 and 4
- 140. Assertion (A) :** All the proteins in our food are digested in small intestine only.  
**Reason (R) :** The protein-digesting enzyme from pancreas are released into small intestine. [2005]  
 (a) Both A and R are individually true and R is the correct explanation of A  
 (b) Both A and R are individually true but R is not the correct explanation of A  
 (c) A is true but R is false  
 (d) A is false but R is true
- 141. Assertion (A) :** *Amoeba* reproduces by fission.  
**Reason (R) :** All unicellular organisms reproduce by asexual methods. [2005]  
 (a) Both A and R are individually true and R is the correct explanation of A  
 (b) Both A and R are individually true but R is not the correct explanation of A  
 (c) A is true but R is false  
 (d) A is false but R is true
- 142. Assertion (A) :** The person with *Diabetes insipidus* feels thirsty.  
**Reason (R) :** A person with *Diabetes insipidus* suffers from excess secretion of vasopressin. [2005]  
 (a) Both A and R are individually true and R is the correct explanation of A  
 (b) Both A and R are individually true but R is not the correct explanation of A  
 (c) A is true but R is false  
 (d) A is false but R is true
- 143.** Pneumoconiosis affects the workers who work mainly in [2005]  
 (a) Tanneries (b) Coal mining industry  
 (c) Distilleries (d) Glass industry
- 144.** Consider the following statements with reference to the human body: [2006]  
 1. The common bile duct releases its contents into stomach.  
 2. The pancreatic duct releases its contents into duodenum.  
 Which of the statements given above is / are correct?  
 (a) 1 only (b) 2 only  
 (c) Both 1 and 2 (d) Neither 1 nor 2
- 145.** Which one among the following is not a good source of nutritional calcium? [2006]  
 (a) Rice (b) Ragi  
 (c) Skimmed milk (d) Egg
- 146.** Consider the following statements: [2006]  
 1. Caffeine, a constituent of tea and coffee is a diuretic.  
 2. Citric acid is used in soft drinks.  
 3. Ascorbic acid is essential for formation of bones and teeth.  
 4. Citric acid is a good substitution for ascorbic acid in our nutrition.  
 Which of the statements given above are correct?  
 (a) 1 and 2 only (b) 1, 2 and 3 only  
 (c) 3 and 4 only (d) 1, 2, 3 and 4
- 147.** Consider the following statements: [2006]  
 1. ELISA test is employed as the first and most basic test for an individual to detect cancer.  
 2. Almost 50% of human beings have Rh<sup>+</sup> blood while the remaining have Rh<sup>-</sup> blood.  
 Which of the statement(s) given above is/are correct?  
 (a) 1 only (b) 2 only  
 (c) Both 1 and 2 (d) Neither 1 nor 2
- 148.** What is the name of the vessel that delivers the nutrient/ rich blood from the stomach and small intestine to the liver? [2006]  
 (a) Left hepatic artery  
 (b) Hepatic vein  
 (c) Right hepatic artery  
 (d) Hepatic portal vein

149. Which one of the following pairs is not correctly matched? [2006]
- | Recent Scientific Achievement                                   | Country |
|---|---------|
| (a) Creating the world first mouse with a full human chromosome | U.K     |
| (b) Cloning a human embryo for the first time                   | Germany |
| (c) Guiding a spacecraft for collision with a comet             | U.S.A.  |
| (d) Landing a spacecraft on an asteroid                         | Japan   |
150. Consider the following statements: [2006]
1. Meningococcal Meningitis is transmitted from person to person by mosquito bites.
  2. Vomiting and neck pain are two of the symptoms of Meningococcal Meningitis.
- Which of the statement(s) given above is/are correct?
- (a) 1 only (b) 2 only  
(c) Both 1 and 2 (d) Neither 1 nor 2
151. Robert Webster is known for his work associated with which one of the following? [2007]
- (a) Cardiology (b) Influenza virus  
(c) HIV/AIDS (d) Alzheimer
152. In the human body, which structure is the appendix attached to? [2007]
- (a) The large intestine  
(b) The small intestine  
(c) The gall bladder  
(d) The stomach
153. In human body, which one of the following hormones regulates blood calcium and phosphate? [2007]
- (a) Glucagon  
(b) Growth hormone  
(c) Parathyroid hormone  
(d) Thyroxine
154. How do most insects respire? [2007]
- (a) Through skin (b) Through gills  
(c) By lungs (d) By tracheal system
155. In human beings, normally in which one of the following parts, does the sperm fertilize the ovum? [2007]
- (a) Cervix  
(b) Fallopian tube  
(c) Lower part of uterus  
(d) Upper part of uterus
156. Which one of the following parts of the human brain is the regulating centre for swallowing and vomiting? [2007]
- (a) Cerebellum (b) Cerebrum  
(c) Medulla oblongata (d) Pons
157. Production of which one of the following is a function of the liver? [2007]
- (a) Lipase (b) Urea  
(c) Mucus (d) Hydrochloric acid
158. Which one of the following is not a digestive enzyme in the human system? [2007]
- (a) Trypsin (b) Gastrin  
(c) Ptyalin (d) Pepsin
159. Which one of the following is the correct sequence in the order of decreasing length of the three structural parts given below of small intestine in the human body? [2007]
- (a) Jejunum - Duodenum - Ileum  
(b) Ileum - Duodenum - Jejunum  
(c) Jejunum - Ileum - Duodenum  
(d) Ileum - Jejunum - Duodenum
160. In which of the following kinds of organisms is the phenomenon found wherein the female kills the male after copulation? [2008]
- (a) Dragonfly (b) Honeybee  
(c) Spider (d) Pit viper
161. For which one of the following snakes is the diet mainly composed of other snakes? [2008]
- (a) Krait (b) Russell's viper  
(c) Rattlesnake (d) King cobra
162. What is the pH level of blood of a normal person? [2008]
- (a) 4.5–4.6 (b) 6.45–6.55  
(c) 7.35–7.45 (d) 8.25–8.35
163. **Assertion (A):** In human body, liver has important role in fat digestion.  
**Reason (R):** Liver produces two important fat-digesting enzymes. [2008]
- (a) Both A and R are individually true and R is the correct explanation of A  
(b) Both A and R are individually true but R is not the correct explanation of A  
(c) A is true but R is false  
(d) A is false but R is true
164. Among the following, which one lays eggs and does not produce young ones directly? [2008]
- (a) Echidna (b) Kangaroo  
(c) Porcupine (d) Whale
165. The release of which one of the following into ponds and wells helps in controlling the mosquitoes? [2008]
- (a) Crab (b) Dogfish  
(c) *Gambusia* fish (d) Snail
166. Among the following, which one is not an ape? [2008]
- (a) *Gibbon* (b) *Gorilla*  
(c) *Langur* (d) *Orangutan*
167. In the context of genetic disorders, consider the following:  
A woman suffers from colour blindness while her husband does not suffer from it. They have a son and a daughter. In this context, which one of the following statements is most probably correct? [2009]
- (a) Both children suffer from colour blindness.  
(b) Daughter suffers from colour blindness while son does not suffer from it.  
(c) Both children do not suffer from colour blindness.  
(d) Son suffers from colour blindness while daughter does not suffer from it.

- 168.** In the context of Indian wild life, the flying fox is a [2009]  
 (a) Bat (b) Kite  
 (c) Stork (d) Vulture
- 169.** With reference to the evolution of living organisms, which one of the following sequences is correct? [2009]  
 (a) Octopus-Dolphin-Shark  
 (b) Pangolin-Tortoise-Hawk  
 (c) Salamander-Python-Kangaroo  
 (d) Frog-Crab-Prawn
- 170.** The Panda belongs to the same family as that of [2009]  
 (a) Bear (b) Cat  
 (c) Dog (d) Rabbit
- 171.** The marine animal called Dugong which is vulnerable to extinction is [2009]  
 (a) Amphibian (b) Bony fish  
 (c) Shark (d) Mammal
- 172.** Widespread resistance of malarial parasite to drugs like chloroquine has prompted attempts to develop a malarial vaccine to combat malaria. Why is it difficult to develop an effective malaria vaccine? [2010]  
 (a) Malaria is caused by several species of *Plasmodium*  
 (b) Man does not develop immunity to malaria during natural infection  
 (c) Vaccines can be developed only against bacteria  
 (d) Man is only an intermediate host and not the definitive host.
- 173.** Consider the following statements: [2010]  
 1. Hepatitis B is several times more infectious than HIV / AIDS  
 2. Hepatitis B can cause liver cancer  
 Which of the statements given above is/ are correct?  
 (a) 1 only (b) 2 only  
 (c) Both 1 and 2 (d) Neither 1 nor 2
- 174.** At present, scientists can determine the arrangement or relative positions of genes or DNA sequences on a chromosome. How does this knowledge benefit us?  
 1. It is possible to know the pedigree of livestock.  
 2. It is possible to understand the causes of all human diseases.  
 3. It is possible to develop disease-resistant animal breeds. [2011 - I]  
 Which of the statements given above is/are correct ?  
 (a) 1 and 2 only (b) 2 only  
 (c) 1 and 3 only (d) 1, 2 and 3
- 175.** Microbial fuel cells are considered a source of sustainable energy. Why? [2011 - I]  
 1. They use living organisms as catalysts to generate electricity from certain substrates.  
 2. They use a variety of inorganic materials as substrates.  
 3. They can be installed in waste water treatment plants to cleanse water and produce electricity.  
 Which of the following statements given above is/ are correct?  
 (a) 1 only (b) 2 and 3 only  
 (c) 1 and 3 only (d) 1, 2 and 3
- 176.** Human activities in the recent past have caused the increased concentration of carbon dioxide in the atmosphere, but a lot of it does not remain in the lower atmosphere because of  
 1. its escape into the outer stratosphere.  
 2. the photosynthesis by phytoplankton in the oceans.  
 3. the trapping of air in the polar ice caps. [2011 - I]  
 Which of the statements given above is/are correct?  
 (a) 1 and 2 (b) 2 only  
 (c) 2 and 3 (d) 3 only
- 177.** In the context of ecosystem productivity, marine upwelling zones are important as they increase the marine productivity by bringing the [2011 - I]  
 1. decomposer microorganisms to the surface.  
 2. nutrients to the surface.  
 3. bottom-dwelling organisms to the surface.  
 Which of the statements given above is/are correct?  
 (a) 1 and 2 (b) 2 only  
 (c) 2 and 3 (d) 3 only
- 178.** A company marketing food products advertises that its items do not contain trans-fats. What does this campaign signify to the customers? [2011 - I]  
 1. The food products are not made out of hydrogenated oils.  
 2. The food products are not made out of animal fats/oils.  
 3. The oils used are not likely to damage the cardiovascular health of the consumers.  
 Which of the statements given above is/are correct?  
 (a) 1 only (b) 2 and 3 only  
 (c) 1 and 3 only (d) 1, 2 and 3
- 179.** A married couple adopted a male child. A few years later, twin boys were born to them. The blood group of the couple is AB positive and O negative. The blood group of the three sons is A positive, B positive, and O positive. The blood group of the adopted son is? [2011 - I]  
 (a) O positive  
 (b) A positive  
 (c) B positive  
 (d) Cannot be determined on the basis of the given data
- 180.** Regular intake of fresh fruits and vegetables is recommended in the diet since they are a good source of antioxidants. How do antioxidants help a person maintain health and promote longevity?  
 (a) They activate the enzymes necessary for vitamin synthesis in the body and help prevent vitamin deficiency  
 (b) They prevent excessive oxidation of carbohydrates, fats and proteins in the body and help avoid unnecessary wastage of energy  
 (c) They neutralize the free radicals produced in the body during metabolism  
 (d) They activate certain genes in the cells of the body and help delay the ageing process



**181.** Consider the following kinds of organisms : [2012 - I]

1. Bacteria
2. Fungi
3. Flowering plants

Some species of which of the above kinds of organisms are employed as biopesticides?

- (a) 1 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**182.** Which one of the following sets of elements was primarily responsible for the origin of life on the Earth? [2012 - I]

- (a) Hydrogen, Oxygen, Sodium
- (b) Carbon, Hydrogen, Nitrogen
- (c) Oxygen, Calcium, Phosphorus
- (d) Carbon, Hydrogen, Potassium

**183.** Consider the following kinds of organisms : [2012 - I]

1. Bat
2. Bee
3. Bird

Which of the above is/are pollinating agent/agents?

- (a) 1 and 2 only
- (b) 2 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**184.** Improper handling and storage of cereal grains and oilseeds result in the production of toxins known as aflatoxins which are not generally destroyed by normal cooking process. Aflatoxins are produced by

[2013 - I]

- (a) bacteria
- (b) protozoa
- (c) moulds
- (d) viruses

**185.** Which of the following adds / add nitrogen to the soil?

[2013 - I]

1. Excretion of urea by animals
2. Burning of coal by man
3. Death of vegetation

Select the correct answer using the codes given below.

- (a) 1 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**186.** Which of the following diseases can be transmitted from one person to another through tattooing?

[2013 - I]

1. Chikungunya
2. Hepatitis B
3. HIV-AIDS

Select the correct answer using the codes given below.

- (a) 1 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**187.** Consider the following minerals: [2013 - I]

1. Calcium
2. Iron
3. Sodium

Which of the minerals given above is/are required by human body for the contraction of muscles?

- (a) 1 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**188.** Recombinant DNA technology (Genetic Engineering) allows genes to be transferred [2013 - I]

1. across different species of plants
2. from animals to plants
3. from microorganisms to higher organisms

Select the correct answer using the codes given below.

- (a) 1 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**189.** Consider the following animals: [2013 - I]

1. Sea cow
2. Sea horse
3. Sea lion

Which of the above is/are mammal/mammals?

- (a) 1 only
- (b) 1 and 3 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

**190.** Which of the following statements is/are correct?

[2013 - I]

1. Viruses lack enzymes necessary for the generation of energy.
2. Viruses can be cultured in any synthetic medium.
3. Viruses are transmitted from one organism to another by biological vectors only.

Select the correct answer using the codes given below.

- (a) 1 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**191.** In addition to fingerprint scanning, which of the following can be used in the biometric identification of a person? [2014 - I]

1. Iris scanning
2. Retinal scanning
3. Voice recognition

Select the correct answer using the code given below.

- (a) 1 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**192.** Consider the following diseases : [2014 - I]

1. Diphtheria
2. Chickenpox
3. Smallpox

Which of the above diseases has/have been eradicated in India?

- (a) 1 and 2 only
- (b) 3 only
- (c) 1, 2 and 3
- (d) None

**193.** Consider the following pairs : [2014 - I]

- | Vitamin      | Deficiency disease |
|--------------|--------------------|
| 1. Vitamin C | : Scurvy           |
| 2. Vitamin D | : Rickets          |
| 3. Vitamin E | : Night blindness  |

Which of the pairs given above is/ are correctly matched?

- (a) 1 and 2 only
- (b) 3 only
- (c) 1, 2 and 3
- (d) None

**194.** H1N1 virus is sometimes mentioned in the news with reference to which one of the following diseases?

[2015-I]

- (a) AIDS
- (b) Bird flu
- (c) Dengue
- (d) Swine flu

**195.** With reference to bio-toilets used by the Indian Railways, consider the following statements:

[2015-I]

1. The decomposition of human waste in the bio-toilets is initiated by a fungal inoculum.
2. Ammonia and water vapour are the only end products in this decomposition which are released into the atmosphere.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

# HINTS & SOLUTIONS

## A. Botany

1. (b) King Cobra is the only snake that not only lives in holes but also builds a nest.
2. (a) The blooming of desert plants is controlled by low temperature.
3. (c) Living organism require about 27 elements of which 15 are metals. K, Mg, Na and Ca are required in major quantities. Minor quantity of Mn, Fe, Co, Cu, Zn and Mo and trace amount of V, Cr, Sn, Ni and Al are required by some organisms.  
Calcium, magnesium and phosphorus are essential parts of the bones and teeth.  
Calcium is necessary for blood clotting.  
Sodium helps in muscle activity and transmission of nerve.
4. (c) Hormone auxin is responsible to produce seedless tomato fruits.
5. (c) Photosynthesis occurs in green plants by the help of chloroplast. Plasma membrane is a membrane of transport minerals. Cellular respiration related to mitochondria, by which energy releases. Ribosome is helps in protein synthesis.
6. (d) Potato tuber bears buds in small pits known as eyes. Buds develops to branches. Some of the branches become green, erect and leafy stems that grow horizontally under ground.
7. (c) DDT is non-biodegradable chemical. Biomagnification is the phenomenon of increasing concentration of compound in the tissue of organism, as the compound passes up a food chain, usually as a result of food intake. In this case, the concentration of compound will increase with increasing the tropic level. Biomagnifying pollutants which increases in concentration from producers → Primary consumers → Secondary consumers → Tertiary consumers → Top consumer.  
The snake is a tertiary consumer. So the DDT concentration will high in snake.
8. (b) After the pollination of ovary, fruit develops gradually from it.  
Stem of tree develops to wood.  
Seed develops from fertilized ovule.  
Leaf produces starch at the time of photosynthesis.
9. (c) Starch and cellulose both are plant origin. Starch deposits in plant cells, whereas cellulose is most important constituent of plant cell wall. Both starch and cellulose are polymers. Starch is branched polymer of  $\alpha$  - D - glucose unit linked by  $\alpha$  - 1, 4 glycosidic bond. Cellulose is a linear polymer of  $\beta$  - D - glucose unit.  
  
Glucose molecules are present in both starch and cellulose.  
Amylose in starch is responsible for the formation of deep blue colour in the presence of iodine but cellulose does not give any colour at the treatment with iodine, because amylose is absent in cellulose.
10. (a) Ergotism is the effect of long term ergot poisoning, due to ingestion of alkaloids produced by fungus *Claviceps purpurea* which is found in infected cereals and ryes.
11. (d) Mycorrhiza is a symbiotic association between a fungus and the roots of a vascular plant. Mycorrhiza takes carbohydrate from the plants. In return, the fungus helps the plant by supplying water and the important minerals.
12. (a) A keystone species is a species that play a critical role in maintaining the structure of an ecological community and whose impact in the community is greater than would be expected based on its relative abundance or total biomass.
13. (a) Blue green algae is used as a biofertilizer in rice crop. Blue green algae has the nitrogen fixing ability which enhances the production of rice.
14. (c) Phytotron is a type of chamber, designed to provide a controlled environment for the study of plant growth.
15. (a) *Cocoa* contains caffeine, carbonated water, glucose-fructose, kola extract and caramel colour.
16. (b) Canola oil is the lowest in saturated fat, it is high in certain omega 3 fatty acid and mono saturated fats, which are found in nuts and are healthy for the heart.
17. (d) DNA found in mitochondria other than nucleus. The DNA is called mitochondrial DNA.
18. (b) Athlete's Foot disease is caused by parasitic fungus of genus *Trichophyton*. Scaling, flaking and itching of affected areas are the symptoms of this disease. This disease transmitted in moist areas where people walk bare foot.
19. (b) An epiphyte is a plant normally grows on another plant for support. It is non parasitic, but uses the host plant for support. A plant such as tropical orchid or staghorn fern, that grows on another plant upon which it depends for mechanical support but not for nutrient.
20. (a) In bisexual flower, the production of male and female flower (androecium and gynoecium) mature at different times to avoid self-fertilization. That is called dichogamy.

21. (b) Asiatic wild ass – *Equus hemionus*  
Barasingha – *Cervus duvauceli*  
Chinkara – *Gazella gazella*  
Nilgai – *Boselaphus tragocamelus*
22. (d) Deer is monogamous. Monogamous is the organism which has only one spouse and mate at any one time.
23. (c) *Bougainvillea*, *cocoa* and grapes plants are propagated by stem cutting process.
24. (b) Spirogyra and Ulothrix are green algae not blue algae. The chameleon can see in both the direction forward and backward at the same time.
25. (c) Assertion is true because unsaturated fats are more reactive compared with saturated fats due to multiple bonds present between carbon atoms. The reason is false because unsaturated fats have at least double bond in their structure.
26. (a) Molasses is by-product of sugar production process and bagasse of sugar used as a fuel in boilers for sugar factories. But sugar produced from sugar cane and also from sugar beet.
27. (b) The protocol was initially adopted on 11th December 1997. But it entered into force on 16th February 2005, after Kyoto, Japan. So, it is called Kyoto protocol.  
Kyoto protocol deals with reducing the green house gases emission to a level at least 5% below 1990 level. Methane is more effective or harmful green house gas than carbon dioxide.
28. (a) Cellulose is not soluble in water that is why it is used in making shatter-proof glass. Cellulose is a poly saccharide.
29. (b) In pitcher plant, the lamina of leaf is modified into pitcher and the leaf apex gives rise to a coloured lid for attracting the insects.
30. (b) Photosynthesis occurs between wavelengths of about 400 nm and 750 nm. Red and blue colour wavelength is categories in this wavelength. So, plants absorb these colours. Photosynthesis does not occur in the infra-red or in ultraviolet light.
31. (d) Rice fields, coal mining, domestic animal and wet lands all are the sources of the methane.
32. (b) Pitcher plant is an insectivorous plant. It feeds on living creatures including insects and small mammals. These plant attracts the prey with a smell of rotting meat. The victim is dissolved by some chemical enzymes.
33. (c) Probiotics are the living microorganisms that to be healthy for host organism. Lactic acid bacteria, *Bifido* bacteria are common type of microbes used as probiotics. Certain yeast and *Bacilli* may also useful. Probiotics are commonly consumed as a part of fermented food with specially added active live cultures such as yoghurt or as dietary supplements.
34. (c) Grafting is a most common method of vegetative propagation. In this method, parts of two plants are joined in such a way that they grow as a one plant.  
Sweet orange plant is propagated by grafting technique.  
Layering is another type of vegetative propagation. In this method, roots are artificially induced on the stem branches before they are detached from the plant for propagation. Jasmine plant is propagated by this technique.
35. (d) Saffron is a spice obtained from the stigma of the flower of *Crocus sativus* Linnaeus.
36. (c) Methane and nitrous oxide are the two green house gases emitted from rice field. In rice field, the flooding a field cuts off the oxygen supply from atmosphere resulting anaerobic condition which emits methane and nitrogen fertilizer which generally used in rice field for high production, emits nitrous oxide by the reaction with atmospheric oxygen.
37. (b) Ethanol production in India from maize, sugarcane, starch, corn grain etc. Maize is easily available and maize is not costly for product as to economic concern.
38. (b) • Bhiterkanika, Orissa is a protected area for salt water crocodile, where breeding is the main purpose of that protected area.  
• Great Indian Bustard is protected in desert area of Rajasthan.  
• The Eravikulam National Park was established to protect the Nilgiri tahr (wild goat) species.
39. (b) Insectivorous plants prey insects because most of the insectivorous plants grow in those area where there is deficit of nitrogen in nutrients so they catch insect to fulfil its need of nutrients.
40. (b) Mon 863 is genetically modified variety of maize, which is resistant of corn root worm.
41. (a) Both tea and coffee is propagated by seeds and stem cutting, so the (2) option is wrong.
42. (d) Biodiversity hot spots are located in temperate regions and hotspots are present in eastern Himalayas, Western Ghats and Andaman Islands.
43. (c) The fix boundary of national park is described in Wild Life Protection Act, 1972 and the actual area of the national park is notified by state government.  
A biosphere reserve conserves an ecosystem and not just few specific species of plants and animals.
44. (d) Biomagnification is the phenomenon of increasing concentration of compound in the tissue of organism, as the compound passes up a food chain, usually as a result of food intake. In this case, the concentration of compound will increase with increasing the tropic level. Biomagnifying pollutants which increases in concentration from producers → Primary consumers → Secondary consumers → Tertiary consumers → Top consumer. Hawk is the top consumer, so the pesticide concentration will be highest in Hawk.
45. (d) Crop rotation, Sand fences, terracing and wind breaks all are used for sand conservation in India. Sand fences is a simple and cheap method of inducing accretion of sands in arid and sandy areas.

46. (c) *Pongamia Pinnata* is adaptable to arid zones, and has a varied habitat distribution and able to grow in a variety of soils, it is native to humid and sub-tropical environment and grows naturally along coasts and river banks of India and Myanmar. It is nitrogen-fixing trees.
47. (b) Phloem layer of tissue just below the bark is responsible for carrying food from leaves to roots.
48. (c) Except 3rd, all the statements are correct.
49. (b) Nostoc fix atmospheric nitrogen and are used as inoculations for paddy crop.
50. (c) Fruits respire. They give out ethylene which helps in ripening. When fruits are kept in cold storage the rate of ethylene production can be controlled and shelf life of fruits can be increased.
51. (c) During a transplant the fine roots are destroyed due to the jostling during the uprooting process. These root hairs come under a shock. The plant which has been transplanted either takes time to readjust to the new soil or dries up and dies due to the root hair loss.
52. (d) To inhibit water loss or to conserve water most of the desert species have waxy leaves that keep them water proof when stomata are closed. Water is further conserved by reducing surface area so most succulents have few leaves or no leaves. Some desert plants have thorns instead of leaves. Thorns do not let the water go out.
53. (d) Mycorrhizal associations play vital role in plant nutrition. They greatly increase the efficiency of nutrient and water uptake; enhance resistance to pathogens, and buffer plant species against several environmental stresses and drought resistance. Mycorrhizal also improve plant growth and survival in soils contaminated by heavy metals.
59. (d) Protein is a complex organic compound of Carbon, Hydrogen, Oxygen and Nitrogen. It is a long chain molecule composed of amino acids ( $R - CH(NH_2)COOH$ ) joined by peptide bonds.
60. (a) Thyroxine hormone and tri-iodothyronine hormone are secreted by thyroid follicular cells of thyroid gland. The major component of thyroxine hormone is iodine. Deficiency of iodine causes goitre in human.
61. (b) Linus Carl Pauling is much known for his controversial thesis proposing that high dose of vitamin- C would help not only in prevention of common cold but also in prevention of cancer. Linus Carl Pauling is the only person to have received two unshared Nobel prizes in 1954 for chemistry and in 1962 for peace.
62. (a) Cancer is a disease characterized by abnormal cell growth and later results to tumour when a tumour successfully spreads to other parts of the body and starts invading and destroying other healthy tissues. Cancers are classified as carcinomas, sarcomas and melanoma according to the tissues.

63. (d)	Invention	Year	Scientist
	Organ transplant	– 1959	– Josep E. Murray
	Bypass surgery	– 1960	– Albert Einstein
	Test tube baby	– 1978	– Louis Joy Brown
	Plastic surgery	– 1827	– Dr. John Peter Mettauer

64. (b) Tuberculosis is caused by bacteria *Mycobacterium tuberculosis*. Infection is caused by drinking infected milk, breathing in infected dust, droplet infection through having germs coughed in the face.
65. (c) Xerophthalmia is caused by vitamin A. Generally this disease is found in poorer section of the society. The symptom includes night blindness and eye irritation.
66. (b) Vitamin A group includes retinol. Their parent carotene is a vitamin substance as  $\beta$ -carotene. Pepsin is an enzyme produced in stomach, which digests protein. Progesterone is an hormone, produced in human ovary. Keratin is a protein. The main component of hair and nail is keratin.
67. (d) *Diabetes mellitus* is caused due to deficiency of insulin hormone. The hormone insulin maintains the blood sugar in body. Deficiency of insulin in human body causes increase the sugar level in blood, which leads to *Diabetes mellitus*.
68. (b) AIDS is a viral disease. The virus is called HIV. This disease transmitted by sexual intercourse, blood transfusion and from pregnant mother to baby through placenta.
69. (d) Malnutrition is defined as the insufficient, excessive or imbalanced consumption of nutrients. So under nutrition, over nutrition and imbalanced nutrition leads to malnutrition.

## B. Zoology

54. (d) Diphtheria, Leprosy, Plague are Bacterial diseases. AIDS, Polio, Pneumonia, Gonorrhoea, Syphilis- Viral disease. Japanese B encephalitis – Protozoan disease. Colour blindness and Haemophilia – Sex linked disease. Sickle cell anaemia is a genetic disease in which RBC became sickle shaped.
55. (b) Person having blood group 'AB' is called universal recipient because the 'AB' blood group has no antibody in the blood plasma. So, the person can accept any type of blood group (i.e. A, B and O)
56. (a) The amnion is a membrane that protects the developing embryo by a fluid-filled space called amniotic cavity. Amnion is formed above the embryo.
57. (d) Leprosy is caused by *Mycobacterium leprae* and tuberculosis is caused by *Mycobacterium tuberculosis*. The effective drug for *Mycobacterium species* is Rifampicin.
58. (d) Normal body temperature of human is  $37^\circ\text{C}$ . But when we convert  $37^\circ\text{C}$  into Kelvin it becomes 310 K because  $0^\circ\text{C} = 0^\circ\text{C} + 273 = 273\text{ K}$

$$37^\circ\text{C} = 37^\circ + 273 = 310\text{ K}$$



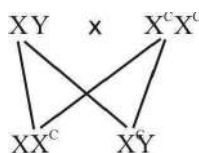
70. (d) Cholera, Typhoid and Jaundice are water born diseases. In shallow hand pumps there is possibility of microbial contamination ( bacteria) to water. But fluorosis occurs due to excess amount of fluorine found in water.
71. (b) Besides proteins and carbohydrates, approximately 67% of calcium, 35% of magnesium and 44% of the phosphorus found in milk.
72. (a) Fat present below the skin surface in our body, act as a insulator against loss of heat from the body. The deposited fat works as barrier, which prevents loss of heat.
73. (c) The composition of kidney stone is
- |                                  |   |     |
|----------------------------------|---|-----|
| Calcium oxalate                  | – | 80% |
| Uric acid                        | – | 5%  |
| Amino acid cystine               | – | 2 % |
| Magnesium and ammonium phosphate | – | 13% |
74. (d) Parathyroid gland is not controlled by pituitary. The parathormone which secrets from this gland regulates calcium and phosphorus ion in body.
75. (c) In human body oxygen first comes through lungs. From lungs to different tissue via blood.
76. (b) Corpus luteum is a mass of cells found in ovary. It produces progesterone hormone. If the ovary is not fertilised, the corpus-luteum degenerates after about two weeks and is gradually replaced by ordinary ovary tissue.
77. (b) Alpha keratin is a protein, found in skin, hair, nail, claws and hooves of animals.
78. (a) Average fat content in buffalo milk is 7.2% and average fat content in cow milk is 4.4%. As per the nutrient components, buffalo milk contains all the nutrients in higher proportion than cow's milk.
79. (d) The major component of honey is fructose.
- Composition of honey in (percentage)
- |              |   |      |          |   |     |
|--------------|---|------|----------|---|-----|
| Fructose     | – | 38.2 | Sucrose  | – | 1.5 |
| Glucose      | – | 31   | Minerals | – | 0.5 |
| Water        | – | 17.1 |          |   |     |
| Maltose      | – | 7.2  |          |   |     |
| Carbohydrate | – | 4.2  |          |   |     |
80. (c) Coronary arteries supply blood to heart. Carotid arteries supply the blood to head region. Hepatic arteries supply to liver and pulmonary arteries supplies blood to the lungs.
81. (d) Daily intake of protein for active woman is 46 gram. But at pregnant women the protein requirement increase to 47 – 60 gm per day.
82. (b) Malaria is the parasitic disease spreads through the sucking of blood through mosquitoes. The malaria parasite invades blood cells. The virus of encephalitis most active in brains. Filaria parasite found in blood lymph and leukaemia is cancer mainly the abnormal cell growth in bone marrow.
83. (c) Antigen is a foreign molecule that invade the body of an organism. Antigen also induce immune response to stimulate lymphocyte to produce antibody. The majority of them are proteins and polysaccharides found on the wall of bacteria and on the cell coats of virus.
84. (d) The sequencing of the entire gensome (the totallity of all genes) was completed in 1996 of *Plasmodium vivax*.
85. (c) We can draw the inference that processed meat is always packed in sealed tins.
86. (d) Bacteria, microalgae and fungi is most widely used in industries. Bacteria like *Lactobacillus sp.* is used in manufacturing of vinegar and alcohol by fementation process.
- Most of algae are used as single cell protein (i.e. *Spirulina*).
- Different drugs like penicillin is manufactured from fungi *Penicillium notatum*.
87. (b) Theory of mutation is postulated by de Vries. Theory of evolution is by Charl's Darwin. Operon concept is given by Jacob and Monad. One gene and one enzyme hyoptheisis is proposed by Beadle and Tautum.
88. (b) *Dodo* birds species existed only on the island of Mauritius. Due to its short wings and bulky body the *Dodo* birds could not fly or flee in the face of danger. So human used to kill them for food. Later the species became extinct from Mauritius. This bird species was helpful in pollinating and propagating seed of trees.
89. (a) The complete conversion of glucose in presence of oxygen, into carbon dioxide, water and release energy is called aerobic respiration. Anaerobic respiration, occurs in the absence of oxygen.
90. (a) Polyunsaturated fatty acid is an anti oxidant, which helps in building of tissues.
91. (a) Malaria parasite is an protozoan. Tuberculosis is a bacteria. Ring worm is a fungus and Poliomyelitis is a virus.
92. (d) Haemophilia is a sex-linked recessive disorder. Clotting of blood is abnormally delayed that even a simple or small cut will result non stop bleeding in affected individual.
93. (a) Endoscopy refers to looking inside the body through endoscope. Endoscope is an instrument used to examine interior of hollow organ of the body through bore scope technique.
94. (c) When ants bite, they inject formic acid in the muscle tissue. This formic acid is found at the mandible of ants.
95. (c) Generally blindness is caused by the dryness and hardness of cornea. Cornea is a clear layer which helps passing of light. It is an outer layer and can be transfer from one person to another.
96. (c) Adrenaline is the hormone prepares the body to deal with anger, fear and danger.
- Estrogen hormone releases from ovary of female. Insulin controls the level of glucagon in blood. Pheromones attracts partners through sense of smell.

97. (d) Ether is used as an anesthesia at the time of surgery to prevent pain.  
Atropine is used as eye drops to dilate the pupil before eye examination.  
Nitroglycerine is widely used in the treatment of heart. Pyrethrin is biodegradable, non-persistent pesticide which is used to kill mosquitoes, fleas and other insects.
98. (a) Royal haemophilia is sex-linked disease. Clotting of blood is abnormally delayed even small cut will result in non stop bleeding in the affected individual. Queen Victoria was a carrier of this disease and produce haemophilic descendents, so haemophilia is a royal disease.
99. (a) Lathyrism is caused by excessive consumption of khesari dal. Lathyrism gets its name from scientific name of khesari dal which is *Lathyrus sativus*. The symptom of the disease is paralysis of both the lower limbs.
100. (d) Assertion is false. In human, sex determination of offspring depends on male because male sperm contains XY chromosome, whereas female has XX chromosome in their ovum.
101. (c) Silk worm yield the fibre from pupa stage, which is commercially used to produce clothes.
102. (b) Haemophilia – Genetic disease caused in sex-linked gene.  
Diabetes – Hormonal disorder disease caused by imbalance of insulin hormone.  
Rickets – Nutritional deficiency disease caused by deficiency of vitamin-D.  
Ringworm – Caused by fungus.
103. (b) The glucose level in blood is commonly expressed as milligram per decilitre.
104. (c) Progesterone secretes from gonads. Growth hormone secretes from pituitary gland. Insulin hormone secretes from pancreas. Cortisone secretes from adrenal gland.
105. (d) Fatigue is caused by excess anaerobic metabolism, which results in production of excess lactic acid. This lactic acid causes the muscle pain.
106. (c) Silica gel granule is a network of inter-connecting microscopic pores, which attract and hold moisture by the phenomena known as absorption.
107. (a) There is no A and B antigen on RBC of "O<sup>-</sup>" blood group, So O, Rh<sup>-</sup> is known as universal blood donor.
108. (b) Metastasis is the spread of cancer from its primary site to other places in the body (*i.e.* brain, liver). Cancer cells can break away from a primary tumour, penetrate in to lymphatic and blood vessels, circulate through the blood stream and grow to a normal tissues in the body.
109. (a) **Ptyalin** – It is present in saliva that catalyzes the hydrolysis of starch into maltose and dextrin.  
**Pepsin** – It is an enzyme released in stomach that degrades food proteins into peptides.
- Renin** – It is an enzyme that is present in kidney and it converts angiotensinogen into angiotensin balancing sodium and potassium level in blood.  
**Oxytocin** – It is a sex hormone that plays a role in sexual reproduction. It induces contraction of smooth muscles.
110. (d) Antigen is a foreign molecule, which invade the body of organism, and induce immune response to stimulate antibody.
111. (b) Ribosome and Endoplasmic reticulum are main site for protein synthesis. Ribosome, which serve as staging area where some RNA helps in protein synthesis. Endoplasmic reticulum is an irregular, double membrane network scattered in cytoplasm, also helps in protein synthesis.
112. (a) • Apoptosis is the process of programmed cell death in multicellular organisms. Apoptosis occurs during normal cell turnover, development and in immune system.  
• Ageing is the accumulation of changes.  
• Degeneration is the deterioration of a tissue or an organ in which its function is diminished or its structure impaired.  
• Necrosis is the disorganized break down of flesh in some part of the body of multicellular organism.
113. (d) Breast bone – Sternum  
Collar bone – Clavicle  
Knee Cap – Patella  
Shoulder Blade – It connects the humerus (upper arm bone) with the clavicle. It is known as scapula.
114. (b) • Tape worms are hermaphrodite (both male and female reproductive organ present).  
• Round worms are unisexual (separate sex).  
• Filariasis is caused by *Wuchereria bancrofti* which is a parasitic nematode.  
• Guinea worm is a long and very thin nematode, not an annelid.
115. (a) In organic evolution, Lamarck believed that any particular part of the body that is put into more frequent use, has tendency to develop stronger and better while that part of body which is put into less or no use has tendency to gradually disappear. So, loss of limbs in snake is an example of use and disuse of organs.
116. (c) • Polyploidy occurs in cells and organisms when there are more than two paired (homologous) set of chromosome founds which controls more than one characters simultaneously.  
• Apomixis is the process of asexual reproduction in which the embryo grow from egg cells without being fertilized.  
• Pleiotropy occurs when a single gene influences multiple phenotypic traits.  
• Polytene is a giant chromosomes found in some two-winged flies.

117. (d) • Testes of man produce hormone testosterone and progesterone hormone is secreted by ovary of woman.  
• Adrenal hormone releases the hormone less amount of cortisol for avoid stress.
118. (d) Foot and mouth disease in animals (hoof and mouth disease) is a viral infection affecting cloven hoofed domestic and wild animals. The viruses belong to the same family picornaviridae.
119. (a) The sexes are separate except few echinoderm species. There is no sexual dimorphism. Fertilization is external and few forms are viviparous.
120. (c) • Viroids are plant pathogens that consists of a short stretch of highly complementary, circular, single-stranded RNA molecule.  
• Prion is an infectious agent composed primarily of protein.  
• *Mycoplasma* is a genus of bacteria that lack of cell wall.  
• Rickettsias possess cell wall.
121. (a) Urination can be induced within some minutes after a person consumes alcohol, because when the kidney filters the waste, the capillaries constricts and affects the filtering ability of kidney. When the body needs to conserve water, the pituitary gland excretes a hormone called vasopressin, which causes the nephron filters to become permeable retaining more water in the blood stream and allowing less water to be excreted in the urine.
122. (d) Assertion is false, but reason is true. Essential amino acids are those which are taken from food and not synthesised in the body, whereas non-essential amino acids need not be supplied in the diet and synthesised in the body. Glycine serine and tyrosine are non-essential amino acids.
123. (a) Origin of new species depends on isolation of gene flow between new species and develop significant genetic divergence.
124. (a) Ticks and mites are categorized under order Arachnids of phylum Arthropoda of animal kingdom.
125. (d) Blood has more platelets than corpuscles. A microlitre of blood contains 5,000-10,000 of White blood cells (WBC) and 150,000-500,000 platelets.
126. (d) Octopus is an animal of class-Cephalopoda and phylum Mollusca. The shell is absent. It is found at bottom of the sea. It kills its prey with poisonous saliva. It can change its colour.
127. (d) AIDS is a viral disease. In this disease the immune system weakens and the body becomes prone to different type of infection by pathogens. Sweating at night, swollen lymph nodes, loss of memory and loss of weight are also symptoms of AIDS.
128. (a) Only crocodile is kept in the Red book or endangered species list.
129. (b) A nephron consists of a network of tiny blood vessels, the glomerulus surrounded by Bowman's capsule. Pressure forces much of the blood plasma through the glomerulus and into Bowman's capsule. The resulting tubular fluid, which contains water and dissolved chemicals then passes into convoluted tubule and loop of Henle. This capillary network provides a mean for pick up and delivery of materials that are reabsorbed and secreted by the kidney.
130. (a) Milk contains vitamin  $B_1$  (Thiamin) and vitamin  $B_2$  (riboflavin). So, statement (a) is not correct.
131. (c) Both the statement is correct.  
• HCl is secreted, providing an acid medium for pepsin action and kill most bacteria and helps in digestion of food. When the food enters in duodenum (small intestine), secretin is produced by intestine that stimulates pancreas for pancreatic juice secretion.  
• Enterogastrone is produced in small intestine.
132. (d) Lachrymal is a tear produced gland which does not function due to deficiency of vitamin -A. Deficiency of vitamin - $B_1$  causes loss of appetite, heart disorders, muscular weakness etc.
133. (c) Insulin is a peptide hormone composed of 51 amino acids. Insulin secrets from pancreas (Islets of Langerhans).
134. (b) *Gibbon* is the only ape found in rain forests of Assam in India, whereas *Pangolins* are found in tropical Asia and Africa.
135. (b) Lymphocytes are the cells that determine the specificity of the immune response to infectious microorganisms and other foreign substances. In humans lymphocytes make up 25 to 33% of the total number of leukocytes. They are found in central lymphoid organs and tissues such as the spleen, tonsils and lymph nodes and large bones.
136. (c) Assertion is true because a balance diet is a diet which contains the correct amount of carbohydrates, proteins and fats. But the reason is false, because human body cells synthesize various fatty acids except linoleic and linolenic fatty acids.
137. (a) • The largest bone in human body is femur.  
• Cholera is caused by a bacteria *Vibrio cholerae*,  
• Athlete's foot disease is caused by parasitic fungus of genus *Trichophyton*.
138. (b) Dengue viruses are transmitted to humans through the bites of infective female *Aedes* mosquito. The symptoms of disease is characterized by high fever, severe muscle pain, joint pain and rashes in body.
139. (c) Black Quarter is a disease which is found in horse.
140. (d) Assertion is false because protein digestion occurs in stomach and small intestine. But reason is true because the proteolytic enzyme from pancreas secretion immediately enters to small intestine from the stomach.



141. (a) Assertion is correct and reason is the correct explanation of assertion.  
Amoeba is a unicellular animal. It reproduce by the process of asexual reproduction. Fission is one of the processes of asexual reproduction, where amoeba divides in half to produce off spring.
142. (c) Assertion is correct but the reason is false.  
Deficiency of vasopressin results *Diabetes insipidus*. In this disease the patients produce enormous quantities of dilute urine and the patient consequently feels thirsty.
143. (b) Pneumoconiosis is a respiratory disease caused by the inhaling various type of dust, such as coal dust, silica dust, asbestos dust etc. So, it is very common in workers of coal mining industries and related industries.
144. (b) Bile duct and pancreatic duct both releases its contents into duodenum. The digestive enzyme (pancreatic juices) releases to duodenum from pancreatic duct.
145. (b) Ragi contains only 344 mg of calcium and in 100 gm of ragi protein is 7.3 gm., fat 1.3 gm, fibre 3.6 gms, carbohydrates 72 gms, moisture 13.1 gm.
146. (b) Caffeine also spelled caffei is most commonly consumed by humans in infusions extracted from the bean of the coffee plant and the leaves of the tea bush, as well as from various foods and drinks containing products derived from the kola nut. Acids are added to soft drinks for extra bite and mouth feel. The primary acid used in colas is phosphoric acid, while the one used in citrus flavoured drinks is usually citric acid. Citric acid is a good substitution of ascorbic acid as per nutritional value.
147. (d) ELISA Test is employed as the first and most basic test for an individual to detect HIV/AIDS. 85% of human beings possess  $Rh^+$  and 15% are  $Rh^-$ .  $Rh^+$  and  $Rh^-$  are the factors present in blood, discovered by Karl Landsteiner.
148. (d) Hepatic portal vein deliver the nutrient rich blood from the stomach and small intestine to the liver. It is the largest gland in the body.
149. (b) Cloning a human embryo for the first time took place in U.S.A. Cloning is a process when identical types of progenies are produced from one individual.
150. (b) Meningococcal meningitis is transmitted from person to person through cough and having a body contact on a regular basis. It is called droplet transmission.
151. (b) Robert Webster is a scientist, his interests include the structure and function of influenza virus proteins and development of new vaccines and antivirals.
152. (a) Appendix is attached to the first portion of large intestine. The appendix has no function in modern human.
153. (c) Parathyroid hormone secrets from parathyroid gland. This hormone regulates calcium and phosphate level in blood. Parathyroid hormone raises the level of calcium in the blood and decreases the level of phosphorous in the blood.
154. (d) Most insects respire through tracheal system that lies on a network of small tubes that channel  $O_2$  directly to the different part of the body. The tracheal system is composed of chitin-ringed tubes called trachea that connect directly to the air through opening in the body wall called spiracles.
155. (b) Fallopian tube is a tube like structure that carries egg from the ovary to uterus. In this tube the sperm meets to ovum and fertilization occurs.
156. (c) The bottom part of the brain stem is called the Medulla oblongata. The medulla oblongata has nerve centres to control many vital body processes like swallowing, vomiting, breathing and heart beat etc.
157. (b) Urea is the main nitrogenous excretory product of Ureotelic animals, produced by liver cells from de-aminated excess amino-acids via the urea cycle.
158. (b) Gastrin is a hormone, which stimulates secretion of digestive enzyme in stomach. Trypsin, Pepsin and Ptyline are the digestive enzymes of human system.
159. (d) The correct sequence in the order of decreasing length of the three structural parts are Ileum – Jejunum – Duodenum of small intestine.
160. (c) Sexual cannibalism is identified only in spiders. In which female organism kills the male before during or after copulation. In most species in which it occurs, sexual cannibalism is related to the larger size of female due to sexual dimorphism.
161. (c) Rattle snake eats small snakes, mice, lizards, birds and insects. The average snake will consume 2-3 times its own weight in various food items during the spring to fall months when the snake is away from its winter den. A snake swallows its prey in one piece.
162. (c) Blood is slightly alkaline and the pH of blood varies from 7.35 – 7.45.
163. (c) The liver secretes bile that forms and stores glycogen and plays an important role in metabolism of protein and fat. It does not contain digestive enzymes and as such does not take part directly in digestion.
164. (d) Whales are viviparous, they give birth to live young, some whales lay eggs. Like all mammals, whale calves are nourished with milk from their mothers.
165. (c) *Gambusia affinis* is an larvivorous fish. This fish is released into ponds and wells to controlling the mosquitoes by eating mosquito larvae, insects and crustaceans.
166. (c) *Gibbon*, *Gorilla* and *Orangutan* are apes, but *Langur* is not an ape, it is prosimians.
167. (d)





From the above graphical presentation we concluded that the son is the colourblind but the daughter is the carrier.

168. (a) Bats are commonly known as fruit bats or flying foxes. In India these are present in North-Eastern parts or in Andaman and Nicobar Islands.
169. (c) According to evolution of living organisms Salamander-Python-Kangaroo, because the evolution started from amphibians 350 million years ago, reptiles appeared 300 million years ago and 200 million years ago first small mammals appeared.
170. (a) *Panda* and bear belongs to family Ursidae. Pandas are medium sized bears. Of all the endangered bear species they have the most distinguished colour combination.
171. (d) *Dugong* is a large marine mammal. *Dugong* has a fusiform body with no dorsal fin or hind limbs, instead of possessing paddle. *Dugong* is heavily dependent on seagrass for subsistence. *Dugong* bear one calf at a time after an approximately 13 month gestation.
172. (b) It is difficult to develop an effective malaria vaccine, because repeated natural infection does not produce detectable resistance to exo-erythrocytic cycle of malaria in man.
173. (c) Hepatitis-B is a potentially life-threatening liver infection caused by the hepatitis B virus. It can cause chronic liver disease and puts people at high risk of death from cirrhosis of liver and liver cancer. Hepatitis-B virus is transmitted between people by contact with blood or other body fluid of an contact with the blood or other body fluid.
174. (d) Human Genome Project is NOT at all limited to only genetic diseases. There are some 30K genes and the genome sequence would provide great help to build the tools to conquer diseases. Here we must note that all diseases have a genetic component, whether inherited (genetic) or resulting from the body's response to environmental stresses like viruses or toxins. The successes of the HGP have even enabled researchers to pinpoint errors in genes—the smallest units of heredity—that cause or contribute to disease. Thus second statement stands correct.
175. (d) A typical microbial fuel cell consists of anode and cathode compartments separated by a cation (positively charged ion) specific membrane. In the anode compartment, fuel is oxidized by microorganisms, generating electrons and protons. Electrons are transferred to the cathode compartment through an external electric circuit, while protons are transferred to the cathode compartment through the membrane. Electrons and protons are consumed in the cathode compartment, combining with oxygen to form water.
176. (c) Since  $\text{CO}_2$  is heavier than air, it sinks in ocean than moving up. Also, during winter, it is observed that  $\text{CO}_2$  is trapped in ice caps.
177. (c) Upwelling brings nutrient-rich water towards the ocean surface, replacing the warmer, usually nutrient-depleted surface water. This is to do with the phytoplankton's and nothing to do with the decomposer microorganisms.
178. (d) A type of trans fat occurs naturally in the milk and body fat of ruminants (such as cattle and sheep) at a level of 2–5% of total fat. Natural trans fats, which include conjugated linoleic acid (CLA) and vaccenic acid, originate in the rumen of these animals.
179. (a) The blood group of the parents are AB and O; the child's blood group may be A or B and since the boy is adopted and it is given in the question that "the blood group of the three sons are  $\text{A}^+$ ,  $\text{B}^+$ ,  $\text{O}^+$ ".
180. (c) Oxidation reactions can produce free radicals. In turn, these radicals can start chain reactions. When the chain reaction occurs in a cell, it can cause damage or death. When the chain reaction occurs in a purified monomer, it produces a polymer resin, such as a plastic, a synthetic fibre, or an oil paint film. Antioxidants terminate these chain reactions by removing free radical intermediates, and inhibit other oxidation reactions. They do this by being oxidized themselves, so antioxidants are often reducing agents such as thiols, ascorbic acid, or polyphenols.
181. (d) All of them are employed as Biopesticides.
182. (b) Carbon, Hydrogen, Nitrogen.
183. (d) All of them are pollinating agents.
184. (c) Aflatoxins are produced by many species of *Aspergillus*, a fungus. *Aspergillus Flavus* and *Aspergillus Parasiticus* are weedy moulds that grow on a large number of substrates, in particular under high moisture conditions.
185. (c) Excretion of urea by animals adds nitrogen to the soil, as urea is the main nitrogen containing substance in the urine of mammals, therefore urea is widely used in fertilizers as the convenient source of nitrogen.

Death of vegetation adds up in soil organic matters including humus. As organic matters decompose inorganic nitrogen is released into the soil.
186. (b) Body piercing or getting one's body tattooed may cost one a huge price- Infection of Hepatitis B and C virus is absolutely possible. The needle used in the act may just be infected with the said virus causing liver disease, which in its ultimate stage often turns cancerous. This is deemed to happen if the needle is not properly sterilized.
187. (c) Calcium is the most common and abundant mineral in the body. It is important for healthy bones and teeth, helps muscle relax and contract, important in nerve functioning, blood clotting etc. Sodium is needed for proper fluid balance, nerve transmission and muscle contraction.

- 188. (d)** Recombinant DNA are DNA sequences, which result from bringing genetic material from different sources. The genes can be transferred between any species, that is across different species of plants, from animals to plants and from microorganisms to higher organisms.
- 189. (b)** Sea cow is a mammal. It is a herbivore and it grows up to 9 meters. It looks like a large seal. Sea horse is a fish not a mammal. Sea lion is a mammal. It is a carnivore. It is also known as eared seal.
- 190. (a)** Viruses have no metabolic enzymes and cannot generate their own energy. Viruses require a growth medium containing living cell therefore cannot be cultured in any synthetic medium. Viruses are transmitted from one organism to another not only by biological vectors but also by mechanical vectors. Mechanical vector like an arthropod vector which transmit an infective organism from one host to another but it is not essential to the life cycle of the parasite.
- 191. (d)** Biometrics identification is used in computer science as a form of identification and access control. Biometric identifiers are the distinctive, measurable characteristics used to label individuals. Biometric identifiers are categorized as physiological versus behavioral characteristics. Physiological Biometric identifiers are fingerprint, palm veins, face recognition, DNA, palm print, hand geometry, iris recognition, retina and odour/scent. Behavioural identifiers are typing rhythm, gait and voice.
- 192. (b)** Smallpox is the only disease eradicated from India. The last known small pox case was reported in 1965 from Katihar district, Bihar.
- 193. (a)** Deficiency of vitamin C causes Scurvy, disease of gums. Deficiency of vitamin D causes Rickets, disease of bones and Deficiency of Vitamin A causes night blindness, disease of eyes.
- 194. (d)** H1N1 flu is also known as swine flu. The cause of swine flu is an influenza A virus type designated as H1N1.
- 195. (d)** The bio-toilets are fitted underneath the lavatories and the human waste discharged into them is acted upon by a particular kind of bacteria that converts it into non-corrosive neutral water. The new-age green toilets have been designed by Railways along with Defence Research and Development Organisation (DRDO) keeping in mind the requirements of Indian trains.

