8th STD

11 WATER

SCIENCE

1. Our body is made up of water (65 %)
2. Chemical name of water is dihydrogen monoxide (H_2O)
3. The process of breaking down of water molecules by the passage of electric current is known as electrolysis of water.
4. It is the hydrogen that extinguishes the match that makes a pop sound.
5. In electrolysis hydrogen addes negative charge.
6. In electrolysis oxygen adds positive charge.
7. The ratio of hydrogen and oxygen is 2 : 1.
8. Water was first prepared in 1781 by an English Scientist Henry Cavendish he discovered hydrogen gas.
9. $2H_2O \xrightarrow{\text{Electrolysis}} 2H_2 \uparrow + O_2 \uparrow$
10. Cavendish is noted for his discovery of hydrogen he called it inflammable air.
11. Pure water boils at 100º C at one atmosphere pressure.
12. Pure water freezes at exactly 0º C at one atmospheric pressure.
13. Pure water has a density of 1 gm / cm3.
14. Ice is lighter than water.
15. Density of water at different temperature.

Temperature	Density
0º C	0.91 / CC (ice)
0º C	0.97 g / CC (water)
4º C	1g / CC
> 4º C	< 1 g / CC

16. The amount of heat energy required by ice to change into water is called latent heat of fusion of ice.
17. The highest latent heat of fusion i.e. 80 calories / g or 336 J / g.
18. The steam has the highest latent heat vaporization and its value is 540 calories / g 2268 J / g.
19. The amount of heat that is needed to raise the temperature of a unit mass of a substance by 1º C is called specific heat capacity of that substance.
20. One gram of water requires 1 calorie of heat to raise its temperature by 1º C.
21. The specific heat capacity of water used in radiator pump.

22. If it is heated to 2000º C, 0.02 % of water decomposes to form hydrogen and oxygen gas.

$$2H_2O \xrightarrow{2000^\circ C} 2H_2 + O_2$$

23. When water acts as a catalyst hydrogen reacts with chlorine to produce hydrogen peroxide.

$$H_2 + Cl_2 \xrightarrow[\text{Sunlight}]{\text{Moisture}} 2HCl$$

24. Sodium reacts with water to form sodium hydroxide.

$$2Na + 2H_2O \rightarrow 2NaO + H_2$$

25. Magnesium reacts with water to form magnesium hydroxide.

$$Mg + 2H_2O \rightarrow Mg(OH)_2 + H_2 \uparrow$$

26. Chemical name for rust is iron oxide.
27. Copper is used for making pipes and boliers.
28. Carbon reacts with steam to produce water gas (Carbon monoxide + H_2)

$$C + H_2O \xrightarrow{1000^\circ C} CO \uparrow + H_2 \uparrow$$

29. Water gas is carbon monoxide and hydrogen combined mixture.
30. Chlorine gas dissolves in water and produces hydrochloric acid.

$$2Cl_2 + 2H_2O \xrightarrow{\text{Sunlight}} 4HCl + O_2 \uparrow$$

31. Water is a universal solvent.
32. A solvent is a substance which dissolves other substances (Solute).
33. 35.6 % oxygen dissolved in water.
34. As oxygen dissolved in water, fishes are survived.
35. Aquatic plants make use of dissolved carbon di oxide for photosynthesis.
36. Carbondioxide dissolved in water reacts with limestone to form calcium bicarbonate.
37. Snails, oysters extract water from calcium bicarbonate to build their shells.
38. Chemical name for common salt is sodium chloride.
39. Every litre of sea water contains 35 grams of dissolved salts.
40. Saline water is non potable water.
41. Calcium (Ca), Magnesium (Mg), Potassium (K), Copper (Cu) and Zinc (Zn). The minerals in water give it a certain taste.
42. The salinity of water is more in the Dead Sea.
43. Potable water should be free from bacteria, virus and protozoa.
44. Out of the total fresh water available on the earth, only 1 % is present in water bodies such as rivers and lakes.

45. Every year 4.5 million children die due to diarrhoea, Access to clean water improves hygiene and health.
46. Potash alum is added to water to speed up the process of sedimentation.
47. The chemicals that are used in sterilization process are cholrine and ozone.
48. The process of adding chlorine, in adequate amounts to water is called chlorination.
49. Ozonisation is a process in which water is treated with ozone gas to kill the germs present in it.
50. Aeration is the process in which air under pressure in blown into filtered water. This also helps to kill the germs.
51. The filtered water is treated chemically to remove the remaining germs or bacteria.
52. RO purifiers also have a UV (Ultra violet) unit that destroys the germs present in water.
53. When these salts are present in very small quantities in water it is called soft water.
54. In hard water form a thick precipitate called scum instead of forming lather.
55. Hardness of water is due to the presence of dissolved salts of calcium and magnesium.
56. Permanent hardness results due to the presence of chloride and sulphate salts of calcium and magnesium.
57. Washing soda is used to remove permanent hardness of water.
58. The water obtained after distillation is called distilled water.
59. The pleasant taste of drinking water is due to the presence of dissolved substances which include air, carbon di oxide and minerals.
60. There are 17 major river basins in Tamil Nadu with 61 reservoirs.
61. About 90 % of the available surface water has already been tapped mainly for agriculture and irrigation.
62. Some shampoo, face wash, shower gel and tooth paste have small round pieces of plastic added to them. These are called microbeads.
63. On an average, a person uses 135 litres of water per day for washing clothes, cooking, bathing etc.
64. Plastics block drains spreading vector borne diseases such as malaria and dengue.
65. Toxic chemicals in water bodies it is called Eutrophication.
66. Types of pollutants

Pollutants	Sources	Domestic
Sodium sulphate and phosphate	Detergents	In humans they cause developmental, reproductive and neuro toxicity and endocrine disruption. Phosphates make bacteria and algae grow fater, and use up all the dissolved oxygen. This leads to a decrease in animal and plant diversity

Plastic fibres and microbeads	Plastic clotting and hair, beauty and skin products	These end up in water bodies such as lakes, rivers and the ocean. Here they attract toxic chemicals. Marine animals often eat them as they confuse them as their natural source of food and the toxins can move up the food chain.
DDT (Dichloro Diphenyl Trichloro ethane)	Insecticides	It affects the central nervous system of insects, animals and humans. It accumulates in the food chain and impacts the top predators the most.
Nitrates and phosphates	Fertilisers	Bacteria and algae gran faster and they use up all the dissolved oxygen and this leads to a decreases in animal and plant diversity.
		Industrial
Lead, Mercury, Cadmium, Chromium and Arsenic	Chemical, textile and leather industries and leachate from open dumping of solid waste	Toxic to animals, plants and bacteria in the water pollutes potable ground water. Negatively impacts human health.

Exercise

Choose the correct answer:

1. **Water was first prepared by**
   a) Hentry Cavendish b) J.J. Thomson
   c) John Dalton d) Lavoisier

2. **Molecular formula for water is**
   a) HCl b) H_2O c) H_2SO_4 d) SO_2

3. **Latent heat of fusion of ice is**
   a) 180 calories / gram b) 150 calories / gram
   c) 280 calories / gram d) 80 calories / gram

4. **Carbon monoxide and hydrogen are combined mixture is**
   a) Distilled water b) Soda water c) Water gas d) Water

5. **1 litre of potable water contains sodium chloride amount is**
   a) 55 gram b) 45 gram c) 35 gram d) 65 gram

8th STD

12 Acids And Bases

SCIENCE

1. Aspirin is acidic and antacids.
2. A word 'Acid' which means sour.
3. The term acid is derived from the Latin word 'acidus' which means sour.
4. The chemical compounds which have sour taste are generally called as acids.
5. Hydrochloric acid - HCl
   Sulphuric acid - H_2SO_4
   Nitric acid - HNO_3
6. On the other hand acids are produced artificially in industries. These acids are called mineral acids or inorganic acids. Eg. Hydrochloric acid (HCl), Sulphuric acid (H_2SO_4), Nitric acid (HNO_3) etc.
7. Some acids occur naturally in fruits and vegetables. These are called organic acids. Eg. Citric acid, tartaric acid etc.
8. Organic acids and their sources

Name of the acid	Source
Citric acid	Lemon
Lactic acid	Sour milk
Oxalic acid	Tomato
Acetic acid	Vinegar
Malic acid	Apple
Tartaric acid	Tamarind

9. Acids are corrosive in nature.
10. Acids exist in solid state as well. Eg. Benzoic acid.
11. Acids change the colour of the indicators. Blue litmus paper turns red.
12. Methyl orange turns pink when treated with acids.
13. Acids conduct electricity.
14. When the level of hydrochloric acid goes higher, it causes ulcer.
15. Metal + Dilute acids → Metal salt + Hydrogen
    $Zn + 2HCl \rightarrow ZnCl_2 + H_2 \uparrow$
    $Fe + H_2SO_4 \rightarrow FeSO_4 + H_2 \uparrow$
16. Copper or brass cooking vessels are coated with tin metal.

17. Hydrochloric acid present in our stomach helps in the digestion of food materials.
18. Vinegar (acetic acid) is used to preserve food materials.
19. Benzoic acid is also used to preserve food materials like pickles.
20. Sodium or potassium salts of higher fatty acids are used to make washing and bathing soaps.
21. Sulphuric acid is called the king of chemicals.
22. Animals have deoxy ribo nucleic acid. (DNA)
23. Plants contain ribo nucleic acid. (RNA)
24. Soaps are slipperly to the presence of base.
25. Acids which release hydrogen ions in water.
26. Bases are corrosive in nature when come in contact with the skin.
27. Bases release hydroxide ions in dissolved in water.
28. The chemical substances that release hydroxide ions when dissolved in water are called as bases. Eg. Sodium hydroxide (NaOH) and Potassium hydroxide (KOH)
29. Calcium hydroxide and ammonium hydroxide suluble in water and are called alkalis.
30. Common bases in some products

Base	Formula	Products
Magnesium hydroxide	$Mg(OH)_2$	Milk of Magnesia
Sodium hydroxide	NaOH	Detergent
Ammonium hydroxide	NH_4OH	Solution for cleaning windows
Calcium hydroxide	$Ca(OH)_2$	Lime water
Potassium hydroxide	KOH	Soap

31. Sodium carbonate (Na_2CO_3)
    Sodium bicarbonate ($NaHCO_3$)
    Sodium hydroxide (NaOH)
    Potassium hydroxide (KOH)
32. Some bases exist in liquid state.
33. Bases are bitter in taste.
34. Bases are turns red litmus paper into blue.
35. Bases are turns methyl orange to yellow and phenalphthalin to pink colour.
36. Bases also conduct electricity in aqueous solution.
37. Potassium hydroxide is used to make bathing soaps.
38. Sodium hydroxide is used to make washing soaps.

39. Sodium hydroxide is also in paper industries, textile industries and in the preparation of medicines.
40. Calcium hydroxide is used for while washing.
41. Aluminium hydroxide and magnesium hydroxides are used in antacids to cure acidity problems.
42. Ammonium hydroxide is used to manufacture fertilizers, nylon, plastics and rubber.
43. When neutrally is achieved between two different chemical substances with different chemical properties through a reaction then it is called neutralization.
44. Neutralization is a chemical reaction in which an acid and a base react with each other to form salt and water.
45. Salts produced by neutralisation

Acid	Base	Salt
Hydrochloric acid HCl	Sodium hydroxide NaOH	Sodium chloride NaCl
Sulphuric acid H_2SO_4	Sodium hydroxide NaOH	Sodium sulphate Na_2SO_4
Nitric acid HNO_3	Sodium hydroxide NaOH	Sodium nitrate $NaNO_3$
Acetic acid CH_3COOH	Sodium hydroxide NaOH	Sodium acetate CH_3COONa

46. Whenever bees or red ants bite us they inject an acid called formic acid into our body.
47. To suppress the pain a suitable base in the form of calcium hydroxide (lime paste available at home) is applied as to neutralise the formic acid.
48. When we are bitten by was alkaline substance injected by the insect to neutralise the alkalinity we use vinegar which is an acid.
49. We shoul dbrush our teeth twice a day.
50. Magnesium hydroxide and aluminium hydroxide are used as an antacid to prevent hydrochloric acid damage.
51. An indicator or acid base indicator is a chemical substance.
52. Litmus, turmeric juice, beetroot juice are the natural indicators.
53. In basic solution the colour changes from yellow to red.
54. In acidic solution when we are added Hibiscus flower indicator the colour will be changed to deep pink or deep red into green.
55. Litmus is a natural indicator which is etracted from lichens.
56. Blue litmus paper turns red in acidic solution, red litmus paper turns blue in the basic solution.
57. Phenolphthalin and mehtyl orange are the examples for synthetic indicators.

58. Phenolphthalin is a colourless compound its alcoholic form turns pink in basic solution.

59. Solid methyl orange is dissolved in hot water used as an indicator.

60. Methyl orange turns red in acidic solution and yellow in basic solution.

Exercise

Choose the correct answer:

1. Pick out the odd one

a) Acetic acid b) Lactic acid c) Tartaric acid d) Nitric acid

2. Word 'acidus' which means

a) Bitter b) Sour c) Sweet d) Astringent

3. Acid which is in liquid state

a) Hydrochloric acid b) Nitric acid c) Benzoic acid d) Malic acid

4. Match:

i)	**Magnesium hydroxide**	**a)**	**KOH**
ii)	**Sodium hydroxide**	**b)**	**$Ca(OH)_2$**
iii)	**Calcium hydroxide**	**c)**	**NaOH**
iv)	**Potassium hydroxide**	**d)**	**$Mg(OH)_2$**

1) i) c ii) d iii) a iv) b
2) i) c ii) b iii) d iv) a
3) i) d ii) c iii) b iv) a
4) i) d ii) b iii) a iv) c

5. Potassium hydroxide is used for

a) Washing soap b) Calcium hydroxide
c) Bathing soap d) Magnesium hydroxide

8th STD

13 MICRO ORGANISMS

SCIENCE

1. The science that deals with the study of microorgansism is known as microbiology.
2. Virus means 'Poison' in Latin.
3. The study of virus is called virology.
4. A virus contains a core DNA or RNA surrounding that core is a protein coat.
5. Viruses are 10,000 times smaller than bacteria.
6. Viruses show both living and non living characters.
7. Bacteria are single celled prokaryotes.
8. The study of bacteria is called bacteriology.
9. Bacteria ranges from 1 mm to 5 mm (micro meter)
10. Bacteria are of two types based on respiration they are
    i) Aerobic bacteria (requires oxygen)
    ii) Anaerobic bacteria (does not require oxygen)
11. An extra chromosomal DNA called plasmid is present in the cytoplasm.
12. Flagella aids in locomotion.
13. Bacteria are classified according to the shape of their cells. They are
    i) Bacilli Rod shaped bacteria. Eg. Bacillus anthracis
    ii) Spirilla : Spiral shaped bacteria. Eg. Helicobacter pylori
    iii) Cocci : Spherical or ball shaped bacteria. They can stick together in pairs (diplococcus) or form fof chain (streptococcis) or occur in bunches (staphylococcus)
    iv) Vibrio - Comma shaped bacteria. Eg. Vibrio choera.
14. Bacteria is based on arrangement of flagella.
15. ❖ Monotrichons - Single flagella at one end. Eg. Vibrio cholera
    ❖ Laphotrichous - Tuft of flagella at one end. Eg. Pseudomonas.
    ❖ Amphitrichons - Tuft of flagella at both ends. Eg. Rhodospirillum rubrum.
    ❖ Peritrichons flagella all around. Eg. E.coli.
    ❖ Atrichans : Without any flagella. Eg. Corynebacterium diptherae.
16. Bacteria make their own food. Eg. Cyanobacteria.
17. Use chemicals (Ammonia, Hydrogen, Sulphide) to produce their food. This process is called chemo synthesis.
18. Bacteria exhibit symbiotic relationship. Eg. E.coli lives in the intestine of man.
19. Bacteria reproduces by fission (Binary and multiple fission)

20. Fungi are a group of eukaryotic organisms.
21. Unicellular (Eg. Yeast) or multicellular (Eg. Penicillin)
22. The study of fungi is called mycology.
23. There are around 70,000 species of fungi living in the world.
24. Yeast aids in fermentation with the help of the enzyme zymase.
25. Algae are very simple plant like eukaryotic organisms.
26. Algae is thin film on the surface of lakes and ponds. Therefore they are known as 'grass of water'.
27. The study of algae is called algology (phycology).
28. Their size varies from 1 micron to 50 meter.
29. Unicellular Algae - Eg. Chlamydomonas.
30. Multicellular Algae - Eg. Saragassum
31. Chlamydomonas is a simple, unicellular into tile fresh water algae.
32. Chlamydomonas exhibits sexual and asexual modes of reproduction.
33. A protozoan (In Greek 'Protos means first and 'Zoan') means animal.
34. It is a single called eukaryote.
35. Protozoa is included under the kingdom protista.
36. The study of protozoa is called protozoology.
37. Protozoa ranges from 2 to 200 microns.
38. The types of protozoans
    - ❖ Ciliates : Presence of cilia for locomotion. Eg. Paramecium.
    - ❖ Flagellates : Presence of flagella for locomotion. Eg. Euglena.
    - ❖ Pseudopods : Presence of pseudopodia for locomotion. E.g. Amoeba.
    - ❖ Sporozoans : Parasties Eg. Plasmodium
39. Amoeba is a protozoan that moves by means of pseudopodia.
40. Amoeba reproduces by means of fission and sporululation.
41. The word prion is derived from probeinaceons infections particle.
42. A prion is a mutted form of a usually harmless protien.
43. Prions cause diseases by affecting brain or neural tissue.
44. Virion is an entire virus particle.
45. If the virus is found outside the cell (extracellular) it is known as virion.
46. The word 'anti' means 'against'.
47. Sir Alexander Fleming was the first person to discover the antibiotic penicillin in the year 1928.

48. The antibiotic penicillin was obtained from the fungi penicillium chrysogenum.
49. Penicillin is used to treat diseases such as tetanus and diphtheria.
50. Streptomycin is obtained from streptomyces bacteria to cure various bacterial infections.
51. Edward Jenner was the first person to discover small pox vaccine.
52. Edward Jenner coined the term vaccination.
53. Vaccination is otherwise called as immunization.
54. Vaccine is given for preventing Measles, Mumps and Rubella, BCG (Bacille Calmette Guerin)
55. BCG (Bacille Calmette Guerin) Vaccine is given for preventing tuberculosis.
56. Microorganisms are called as decomposers because they act upon degradable wastes.
57. Rhizobium bacteria living in the root nodules of leguminous plants.
58. Pencillin, Rhizobium converting the atmospheric nitrogen as nitrates.
59. Cyanobacteria, Nostoc can also fix nitrogen biologically.
60. Bacillus thuringiensis (Bt cotton) helps to control insects.
61. Trichoderma (Fungi) helps ot protect roots and controls plant pathogens.
62. Baculo viruses (Virus) attack insects and other anthropods.
63. In the anaerobic treatment of sewage Methanobacterium is used.
64. Microbes consume the major part of the organic matter in the effucient. E.g. Nitro bacter sps.
65. Human and animal faccal matter and plant wastes are broken down by anaerobic bacteria to produce methane (biogas) along with carbon di oxide and hydrogen. These bacteria are called as methanogens.
66. Alcoholic drinks are prepared by fermentation process using yeast.
67. Beer is produced by the fermentation of sugars in rice and barley.
68. Bacteria loosen the supporting fibres of the stem by acting on the stem tissues. This process is known as retting.
69. Linen thread is made from these fibres. Eg. Pseudomonas aeruginosa.
70. Yeast is used to make bread and cakes.
71. Bread and cakes are soft due to carbon dioxide gas.
72. Chlorella (green algae) which is rich in protiens and vitamins is added to the dough to enrich the bread with nutrients.
73. When curd is processed cottage cheese (paneer) is obtained.
74. Lactose int he milk gets turned into Lactic acid by the action of Lactobacillus (bacteria)

75. Lactobacillus acidophilus that lives in the human intestine helps in digestion of food.
76. E.coli bacteria living in human intestine help in synthesizing vitamin K and Vitamin B complex.
77. Fermentation process which is carried out by microorganisms results in the production of organic acids, alcohol and esters.
78. Fermentation is the microbial conversion of starch and sugars into alcohol.
79. Pickling is a method of preserving food in an edible antimicrobial liquid.
80. It is of two types chemical pickling and fermentation pickling.
81. Pickling agents. Eg. Vinegar, alcohol.
82. Sugar is used to preserve fruits in an antimicrobial syrup with fruits such as apples, pears, peaches, plums.
83. A process for preservation of liquid food. This method was invented by Louis Pasteur in 1862.
84. Milk is heated up to 70º C kill the bacteria and it is cooled to 10º C to prevent the growth of remaining bacteria.
85. Probiotics are live food supplements used in yoghurt and other fermented milk products.
86. Viruses causing 'flu' are spread through air.
87. Diseases caused by microorganism in plants

Plant diseases	Causative microorganisms	Mode of transmission	Symptoms	Preventive measures / Treatment
Citrus canker	Xanthomonas axonopodis (Bacteria)	Air, water	Lesions on leaves, stems and fruit	Copper based bactericides can be used
Potato blight disease	Phytophthora infestans (Fungi)	Air	Brown lesions on the surface of tubers	Fungicides are used

88. Diseases caused by microorganism in animals

Animal diseases	Causative microorganisms	Mode of transmission	Symptoms	Preventive measures / Treatment
Anthrax (also affects humans)	Bacillus anthracis (Bacteria)	Through contaminate soil and food.	Difficulty in breathing, unconsciousness, loss of appetite	Anthrax vaccine
Foot and month disease	Apththo virus (Virus)	Through air and animal vectors	Fever, blisters in mouth, weight loss decreased milk, production	FMD vaccine

89. Diseases caused by microorganism in human.

Human diseases	Causative micro organisms	Mode of transmission	Symptoms	Preventive measures / Treatment
Tuberculosis	Mycobacterium tuberculosis (Bacteria)	Through air and sputum of infected person	Persistent cough, blood mucos loss of weight, breathlessness	BCG vaccine
Cholera	Vibrio cholera (Bacteria)	By flies and contaminated food and water.	Watery diarrhoea, vomiting, rapid dehydration	Anticholera vaccine maintaining personal hygiene.
Common cold	Influenza	Through air	Running nose, sneezing	Isolation of patient
Rabies	Rhabdo viridae (Virus)	Animal bite	Fever, Hallucination, paralysis, inability to swallaow	Anti - rabies vaccine
Amoebic dysentary	Entamoeba histolytica (Protozoa)	Food water and flies	Severe diarrohoea and blood in stool	Proper sanitation to be followed and metronidazole antibiotic to be administered.
Malaria	Plasmodium (Protozoa)	Female anopheles mosquito	Nausea, vomiting, high fever	Antimalarial drugs like quinine and chloroquine to be taken and usage of mosquito repellants and nets.

Exercise

Choose the correct answer:

1. Match:

i)	**Cholera**	**-**	**a)**	**Plasmodium**
ii)	**Rabies**	**-**	**b)**	**Influenza virus**
iii)	**Malaria**	**-**	**c)**	**Vibrio cholerae**
iv)	**Mucus**	**-**	**d)**	**Rhabdo viridi**

1) i) c ii) d iii) a iv) b
2) i) d ii) c iii) a iv) b
3) i) c ii) d iii) b iv) a
4) i) b ii) c iii) d iv) a

2. Virus means

a) Poison b) Sour c) Spicy d) Rain

3. Single flagella at one end in bacteria is

a) E.coli b) Diphtheria
c) Pseudomonas d) Vibrio cholerae

4. Unicellular fungi is

a) Penicillium b) E.coli c) Yeast d) Zymase

5. Locomotive organism by flagella is

a) Ciliate b) Amoeba c) Euglena d) Plasmodium

8th STD

14 PLANT KINGDOM

SCIENCE

1. The estimated number of plant species on the earth is 8.7 million (1 million = 10 lakhs).
2. Among them 6.5 million species are living on land and 2.2 million species are living in the ocean.
3. 4,00,000 species are flowering plants.
4. Non - flowering plants (Cryptogams)
5. Flowering plants (Phenerogams)
6. Thalophyta, bryophyta, pteridophyta are non - flowering plants.
7. Algae are chlorophyll bearing, simple and primitive plants. These plants are autotrophic.
8. Algae belongs to thallophyta and the plant body of algae is called thallus.
9. The branch of study fo algae is called phycology or algology.
10. Vegetative reproduction takes place by fragmentation. Eg. Spirogyra.
11. Asexual reproduction takes place by spore formation. Eg. Chlamydomonas.
12. Sexual reproduction takes place by means of function of gametes. Eg. Chara spirogyra.
13. Classification of algae based on pigments

Class	Example	Types of Pigments	Rserve food material
Blue green algae (Cyano phyceae)	Ocillatona	Phycocyanin	Cyanophycean starch
Green algae (Chlorophyceae)	Chlamydomonas	Chlorophyll	Starch
Brown algae (Phaeophyceae)	Laminaria	Fucoxanthin	Laminarian starch and Manitol
Red algae (Rhodo phyceae)	Polysiphonia	Phycoerythrin	Floridian starch

14. Algae are consumed by as food by people. Eg. Ulva, spirulina, chlorella etc.
15. Some algae are used as food for domestic animals. Eg. Laminaria, As cophyllum.
16. Blue green algae are essential for the fixing of atmospheric nitrogen into the soil, which increases the fertility of the soil. Eg. Nostoc, Anabaena.
17. Agar agar is extracted from some red algae, namely Gelidioum and Gracillaria.
18. Iodine is obtained from brown algae like Laminaria.

19. Chlorella pyrenoidosa is used in space travel to get rid of CO_2 and to decompose human wastes.
20. Blue green algae are used to produce protein. Eg. Chlorella, spirulina.
21. Fungi belongs to thallophyta.
22. The plant body of fungus consists of filament like structures called hyphae.
23. Several hyphae are arranged in the form of network called mycelium.
24. The cells of fungi are multicellular and eukaryotic.
25. Cell wall of fungi is made up of a chemical substance called chitin.
26. Fungi have no chlorophyll pigments.
27. Three types of fungi namely parasites, saprophytes and symbionts.
28. Some species of fungus live as parasites they absorb food from the living organisms with the help of special root called haustoria. Eg. Cercospora personata.
29. Cercospora personata affects groundnut plants and cause Tikka disease.
30. Fungi grow upon the dead and decaying organic matters and get food from them. Eg. Rhizopus.
31. Some species of fungi are living with algae and mutually benefilted. Eg. Lichen.
32. Fungi are two types namely myxomycetes and Eumycetes.
33. Eumycetes are four types namely phycomycetes, Ascomycetes, Badiomycetes and Deuteromycetes.
34. Penicillin (Pencillium notatum) and Cephalosporin which cure different disease are obtaiend from fungi.
35. The most common edible mushroom is Agaricus (Button mushroom)
36. Fungus like Ashbya gospii and Eremothecium goshbyii) are used to produce vitamin B_2 (riboflavin)
37. Fungus like yeast contain enzymes invertase and zymase.
38. Invertase and zymase which ferment the sugar molasses into alcohol.
39. Diseases caused by fungi in plants

Pathogen	Name of the disease
Fusarium oxysporum	Wilt disease in cotton
Cercospora personata	Tikka disease in ground nut
Colletotrichum falcatum	Red not in sugar cane
Pyricularia oryzae	Blast disease in paddy
Albugo candida	White rust in radish

40. Fungi are placed as third kingdom in R.H. Whittaker's five kingdom of classification because of absence of chlorophyll and starch.

41. Disease caused by fungi in human

Name of the fungi	Name of the disease
Trichophyton sp.	Ring worm [Circular rash on the skin]
Microsporum	Dandruff
Tinea pedis	Athletes foot

42. Difference between algae and fungi

Algae	Fungi
Algae are autotrophs	Fungi are heterotrophs
They have pigments	They have no pigments
Reserve food material is starch	Reserve food materials are glycogen and oil
Some algae are prokaryotic in nature. Eg. Cyanobacteria (Nostac, Anabaena)	All are eukaryotic nature. Eg. Agaricus

43. Penicillin is known as Queen of Medicine. It was discovered by Sir Alexander Fleming in 1928.
44. Claviceps purpuriya is the hallucinagenic fungi.
45. Aspergillus species cause allergy to children.
46. Cladosporium protects against allergy.
47. Bryophytes are terrestorial and non vascular cryptogams. (They have no vascular tissues like xylem and phloem)
48. Bryophytes are named as amphibians of plant kingdom.
49. The plant remains fixed to the substration with the help of root like structure called rhizoid.
50. Sexual reproduction is oogamous type. They have well developed sex organs like antheridia and archegonia.
51. The male sex organ is autheridiu which produces antherozoid. The female sex organ is archegonium which contains an egg.
52. Zygote is the first cell which develops into sporophytic generation.
53. Spore is the first cell of the gametophytic generation.
54. Bryophytes are classified into three classes. They are
    i) Hepaticopsida (Liver worts)
    ii) Antho cerotipsida (Horn worts)
    iii) Bryopsida (Mosses)
55. Sphagnum can absorb large amount of water. Hence, it is used by the gardeness in nursery.
56. Pteridophytes are the first true land plants with xylem and phloem. Hence, they are called vascular cryptogams.

57. Pteridophytes are classified into four classes. They are
    i) Psilopsida (Eg. Psilotum)
    ii) Lycopsida (Eg. Lycopodium)
    iii) Sphenopsida (Eg. Equisetum)
    iv) Pteropsida (Eg. Nephrolepis)
58. Lycopodium is known as club moss Equisetum is known as horse tail.
59. Ferns are used as ornamental plants.
60. The rhizome and petioles of Dryopteris yield the vernifugi drug.
61. The sporocarp of Marsilea (Water ferm) is used as food by some people.
62. Gymnosperm are naked seed plant.
63. The water conducting tissue is trachied and the food conducting tissue is sieve cell.
64. Gymnosperm are classified into four different types. They are
    1. Cycadales, 2. Ginkgoales, 3. Coniferales, 4. Gnetales
65. Economic importance of Gymnosperms
    i) Paper industries - Pinus, Agathis
    ii) Plywood industry - Cedrus, Agathis
    iii) Turpentine oil - Pinus
    iv) Ephedrine medicine - Ephedra
    v) Ornamental plant - Araucaria bid willii
66. Turpententine an essential oil from pain.
67. Ephedrine cures respiratory problems.
68. Angiosperms are closed seeded plants.
69. 'Angio' which means box or closed and 'sperma' which means seed.
70. Angiosperms have vascular tissues called xylem and phloem.
71. Xylem contains vessel, trachied, xylem parenchyma and xylem fibre.
72. Phloem contains sieve tubes, phloem parenchyma, companion cells and phloem fibres.
73. Brinjal plant - Solanum melongena
    Hibiscus - Hibiscus rosasinensis
    Mango - Mangifera indica
74. Angiosperms are divided into two classes. They are
    ❖ Dicotyledons
    ❖ Monocotyledons

75. Dicotyledons
    - ❖ Seed has two cotyledons
    - ❖ Tap root system
    - ❖ Calyx, corolla are present
    - ❖ Pollination occurs mostly by insects
76. Monocotyledons
    - ❖ Seed has only one cotyledon
    - ❖ Fibrous root system
    - ❖ Pollination occurs mostly by wind
77. Taxonomy is the branch of biology that deals with the study of identification, classification description and nomenclature of living organisms.
78. Taxis means arrangement and Nomos means laws.
79. The word 'taxonomy' was first coined by Augustin pyramus de candolle.
80. There are four types of classification
    - i) Artificial system of classification
    - ii) Natural system of classification
    - iii) Phylogenetic system of classification
    - iv) Modern system of classification
81. Artificial system of classification
    - i) Morphological characters
    - ii) Linnaeus classification
    - iii) Linnaeus in his book species plantarum
82. Natural system of classification
    - i) Bentham and Hooker's classification
    - ii) Morphological and reproductive characters
    - iii) Book named General plantarum
    - iv) Used in many Herbaria and botanical garden.
83. Herbarium is the collection of prossed, dried plants posted on a sheet and arranged according any one of the accepted systems of classification.
84. The naming of an organisms with two words is known as Binomial Nomenclature.
    Mango - Mangifera indica
    Mangifera - Genus
    Indica - Species
85. Binomial name was first introduced by Gaspard Bauhin in the year of 1623.
86. Binomial system was implemeated by Linnaeus in his work, species plantanum.
87. The system of naming the plants on scientific basis is known as Botanical nomenclature.

88. Largest Herbarium of India is in Kolkata, which has more than 10,00,000 (one million) species of herbarium specimens.
89. The rules and recommendations regarding binomial nomenclature were found in ICBN. Now it is known as ICN.
90. Dicotyledons (Dicotyledons)
    - ❖ Polypetalae
    - ❖ Gamophatale
    - ❖ Monochlamydeae
91. Polypetalae classification
    - ❖ Thalamiflorae
    - ❖ Disciflorae
    - ❖ Calciflorae
92. Gamopetalae classification
    - ❖ Inferae
    - ❖ Heteromerae
    - ❖ Bicarpellatae
93. Acalypha indica (Kuppaimeni)
    - ❖ Family Euphorbiaceae
    - ❖ Cure the burns on skin
    - ❖ Lemon juice to cure ring worm
94. Aegle marmelos (Vilvam)
    - ❖ Family Rutaceae
    - ❖ To treat indigestion
    - ❖ Cure chronic diarrohea and dysentery
95. Solanum trilobatum (Thood huvalas)
    - ❖ Family solanaceae
    - ❖ Medicine for cough and cold
    - ❖ Tuberculosis
    - ❖ Bronchial asthma
96. Phyllantus amarus (Keezhanelli)
    - ❖ Family Euphorbiaceae
    - ❖ Treatment of Jaundice
    - ❖ Used to treat other liver disorders
97. Aloevera (so the Katrazhai)
    - ❖ Family Liliaceae
    - ❖ Medicine for Inflammations on the skin
    - ❖ Medicine for peptic ulcer

Exercise

Choose the correct answer:

1. **Largest Herbarium of India is in**
   a) Chennai b) Mumbai c) Delhi d) Kolkata

2. **Botanical name for Sothu Katrazhai is**
   a) Aloe vera b) Acalypha indica
   c) Aegle marmelos d) Phyllanthus amarus

3. **Pick out the odd one**
   a) Cycadales b) Gink goales c) Coniferales d) Psilopsida

4. **Match:**

i)	**Cyanophyceae**	**-**	**a) Phycoerythrin**
ii)	**Chlorophceae**	**-**	**b) Phycocyanin**
iii)	**Phaeophyceae**	**-**	**c) Chlorophyll**
iv)	**Rhodophyceae**	**-**	**d) Fucoxanthin**

   1) i) c ii) d iii) a iv) b
   2) i) b ii) c iii) d iv) a
   3) i) b ii) c iii) a iv) d
   4) i) d ii) c iii) b iv) a

5. **Iodine is derived from**
   a) Nostoc b) Laminaria c) Anabaena d) Ascophyllum

8th STD

15 Organisation Of Life

SCIENCE

1. Organisms can be classified into prokaryotes and eukaryotes.
2. In some organisms like bacteria, cyanobacteria and mycoplasma the true nucleus is absent.
3. Well defined nucleus these organisms are called eukaryotes.
4. Some organisms have a single cell body and they are called as unicellular organisms. Eg. Yeast and amoeba.
5. Organisms such as plants, animals and human beings are made of a large number of cells and they are called multicellular organisms.
6. Cell → tissue → organ → organ system → organisms
   A group of cells - tissue
   A group of tissue - organ
   A group of organ system - organisms
7. Cell is the structural and functional unit of life.
8. Cells are often called as builling blocks of life.
9. The study of cells is called cell biology.
10. Animal cell is measured in units of micron (μm).
11. One micron is equal to 1/1000000 meter.
12. The cells of bacteria are the smallest in size (1 - 2 μm)
13. In human body, the smallest cell is red blood cells (7 μm in diameter)
14. The longest one is the nerve cell which reaches a length of about 90 - 100 cm.
15. Human egg (ovum) is 100 μm in size.
16. Mycoplasma with a diameter of 0.001 mm the smallest bacterium.
17. White material of albumin is albumin.
18. Tissues are groups of cells that have a similar structure.
19. They are of two types of tissues are simple tissues and complex tissues.
20. Simple tissues are made up of cells of same type or kind. Eg. Glandular tissue.
21. Complex tissues are made up of different kind of tissues. Eg. Tissues of dry skin.
22. Simple tissue is homogeneous and complex tissue is heterogeneous.
23. Types of tissues
    - ❖ Epithelial (Covering) tissue for protection
    - ❖ Muscular (Contractile) tissue for movements and locomotion.

- ❖ Connective (Supporting) tissue for binding different structures of body
- ❖ Nervous tissue for conduction of nerve impulses.

24. Organs are the structures made up of two or more types of tissues, organized to carry out a particular function. Eg. Brain, Heart.
25. Muscle tissue which help in peristaltic movements to move the food.
26. Blood tissue which helps in transporting nutrients absorbed by the intestine.
27. Nervous tissue is connected to the brain through the nerve tissue, which conveys instructions from the brain.
28. The human eye can differentiate approximately 10 - 12 million colors.
29. Scelera - white of the eye.
30. Conjuctiva is a thin transparent membrane secreting small amounts of mucus and tears.
31. Cornea is to reflect the light that enters the eyes.
32. Iris is to control the size of the pupil depending on the amount of light entering it.
33. Pupil is the small opening located at the middle of the iris. It allows light to come in.
34. The lens with the help of the cornea refracts light which converges on the retina and creates images on it.
35. Retina is the layer present at the back of the eye where all the images are formed.
36. Aqueous humour is a watery fluid that is present in the area between the lesn and the cornea.
37. Vitreous Humour is maintaining the shape of the eye.
38. The larynx has fold of tissue which vibrate witht he passage of air to produce sound.
39. Nose → The wind pipe → Bronchi → Bronchioles → Alveoli.
40. Alveoli is used for exchange of oxygen and carbon di oxide.
41. The process of taking air into the lungs is called inspiration or inhalation.
42. The process of expelling air from the lungs is called expiration or exhalation.
43. Haemoglobin in the blood combines with oxygen to form oxyhaemoglobin.
44. Homeostasis is a property of human biological system where the self - regulating process tends to maintain the balance for the survival.
45. Insulin hormine is secreted whenever the blood glucose level raises.
46. Glucagon hormone in secreted whenever the blood glucose level reduces.
47. Diffusion is the movement of particles from an area of higher concentration to lower concentration.
48. Osmosis is the movement of solvent particles across a semipermeable membrane from a dilute solution into a concentrated solution.
49. The term osmoregulation was coined by Hober in 1902.
50. Cellular respiration is the proces by which organisms break down glucose into a form that the cell can use as energy.

51. The cellular respiration is classified into two types aerobic respiration and anaerobic respiration.
52. Aerobic respiration
    Glucose + Oxygen → Carbon di oxide + Water + Energy
53. Yeast cells convert glucose into carbon di oxide and ethanol, with the release of energy, without using oxygen.
    Glucose + Ethanol → Carbon di oxide + Energy
54. Metabolism is the sum of chemical reactions by which living organisms sustain their life.
55. Anabolism or constructive metabolism is all about building and strong.
56. Catabolism or destructive metabolism, is the process that produces the energy required for all activity in the cells.
57. Catabolism
    Carbohydrate → Glucose
    Glucose → CO_2, water and Heat
    Protein converts into → Amino acid
58. Aerobic respiration releases 19 times more energy than anerobic respiration from the same amount of glucose.
59. In aerobic respiration each glucose molecules produce 36 ATPs.
60. Isotonic the concentration of external and internal solution of the organism are the same.
61. Hypotonic is the external solution concentration is less compared to the concentration of the inner solution of an organism.
62. Hypertonic is the external solution concentration is greater than the concentration of the inner solution of an organism.

Exercise

Choose the correct answer:

1. Building blocks of life is
a) Cell b) Tissue c) Organ d) Organ system

2. Animal cell is measured in units of
a) Metre b) Gram c) Micron d) Milli micron

3. The largest cell is
a) Nerve cell b) Hen's egg c) Egg of an ostrich d) Nervous tissue

4. 'White of the eye' is
a) Conjunctiva b) Cornea c) Sclena d) Iris

5. _____ is synthesized the blood glucose level raises.
a) Insulin b) Glucagan c) Albumin d) Glucose

8th STD

16 Movements In Animals

SCIENCE

1. The movement of an organism from one place to another is known as locomotion.
2. Bristles called setae which are connected with muscles.
3. Muscle contraction and relaxation the earthwarm can move through soil.
4. The body is covered by chitin, a light protective material.
5. A cockroach ahs legs and wings used for movement.
6. Birds show two types of flight gliding and flapping.
7. Flapping is an active flight.
8. Movement of snake is called slithering movement.
9. The body of snake consists of a large number of vertebrae.
10. Since snakes do not have legs they use their muscles and their scales to move.
11. Fish swims with the help of fins.
12. The caudal or tail fin helps in changing direction.
13. Movement of some organs happens because of the combined action of bones and muscles.
14. Amoeba is moved by pseudopodia.
15. The point at which two separate bones meet is called a joint.
16. Joints can be of three types fixed, slightly movable and movable joints.
17. These are six major types of movable joints

Joint	Examples	Description	Mobiling
Ball and socket	Shoulder Hip	A ball shaped head of one bone articulates with a cup like socket of an adjacent bone.	Movement can occur in three planes. This joint allows the greatest range of movement.
Hinge	Elbow, knee, ankle	A cylindrical protrusion of one bone articulates with a trough shaped depression of an adjacent bone.	Movement is restricted toone plane. This joint allows bending and straightening only.
Pivot	Spine (Atlas) Axis Joint at the top)	A rounded or pointed structure of one bone articulates with a ring shaped structure of RAdius Ulna - an adjacent bone.	Movement is restricted to one plane. This joint allows rotation about its longitudinal axis only.

Condyloid	Wrist	Similar to a ball and socket joint but with much flatter articulating surfaces forming a much shallower joint.	Movement can occur in two planes. This joint allows the second greatest range of movement.
Gloding	Spine (between the bony processes of the vertebrae	Articulating surface are almost flat and of a similar size.	Gliding allows movement in three planes, but it is severely limited.
Saddle	Thumb, Shoulder and inner ear	One part is concave (turned inward) at one end and looks like a saddle. The other end is convex (turned outward) and looks like a rider in a saddle.	Flexion extension and abduction addiction movements are seen.

18. The structures between the bones of the skull box are examples of immovable joints.
19. The joint between a rib and the reast bone or betweenthe vertebrae example for slightly movable joint.
20. Ligaments are short bands of tough fibrous connective tissues.
21. 6 types of movable joints
    - ❖ Ball and socket joint
    - ❖ Hinge
    - ❖ Pivot
    - ❖ Condyloid
    - ❖ Gliding
    - ❖ Saddle
22. A synovial joint is a joint which makes connection between two bones consisting of a cartilage lined filled with fluid.
23. Synovial joint which is known as a diarthrosis joint.
24. Feature of synovial joint

Texture	Structure	Functions
Ligament	A band of strong fibrous tissue.	To connect bone to bone.
Synovial joint	A slippery fluid with the consistency of egg whites that is contained within the joint cavity.	To reduce friction between the articular cartilage in the joint.
Articular cartilage	Glassy smooth cartilage that is spongy and covers the ends of the bones in the joint.	To absorb shock and to prevent friction between the ends of the bones in the joint.

Joint capsule	A tough fibrous tissue that has two layers with the fibrous capsule lyging outside the synovial membrane.	The fibrous capsule helps to strengthen the joint, while the synovial membrane lines the joint and secretes synovial fluid.

25. Synovial joint is flexible type of joint between bones.
26. Arthritis however also caused due to the deposition of uric acid crystals in the joints.
27. Skeleton is composed of connective tissues like bones, cartilage, tendens and ligaments.
28. Skeleton is of two types Exoskeleton and endoskeleton.
29. Endoskeleton is the skeleton that is found inside the human body.
30. Skeleton provides structure and shape to the body.
31. Calcium and phosphorus are stored inside the boens.
32. Red blood cells are produced in the bone marrow.
33. Muscular movement would not be possible without tendons and ligaments.
34. The femir or thigh bone is the longest and strongest bone of the human skeleton.
35. The stapes in the middle ear is the smallest and lightest bone of the human skeleton.
36. Cartilages are the supporting and connecting structures.
37. Skeleton they are
    - ❖ Long bones : Found in arms and legs
    - ❖ Short bones : Found in wrist ankle, vertebral column.
    - ❖ Flat bones : Found in skull, ribs, shoulder and hips
    - ❖ Irregular bones : Found in spine and vertebral column, mandible, palatine, inferior nassal concha and hyoid
38. Skeleton is divided into two major parts the axial skeleton and the appendicular skeleton.
39. The axial skeleton consists of the skull, facial bones, sternum, ribs and vertebral column.
40. Skull is formed by 22 bones.
41. 8 bones are fixed together to form the cranium.
42. 14 bones fuse to form the face.
43. Movable joint is the lower jaw.
44. Vertebral column running at the back o fthe body is also called as spine or the backbone.
45. Vertebral column
    - ❖ 7 cervical vertebrae
    - ❖ 12 thoracic vertebrae
    - ❖ 5 lumbar vertebrae
    - ❖ 5 fused sacral
    - ❖ 3 fused coccygeal vertebrae
46. Vertebrae are joined by gliding points.
47. Skull protects the brain.

48. Ribs and sternum protects the heart, lungs and liver.
49. Vertebral column protects the spinal cord.
50. Pectoral girdle is attached the arms.
51. Pelvic girdle is a attached legs.
52. Rib cage occupies the cehst region.
53. Twelve pairs of ribs are present.
54. Ten pairs of pairs are attached to the breast bone at the front.
55. Two pairs of lower ribs are free at front. These are called as free floating ribs.
56. Ribs are contract and expand during the process of breathing.
57. Humans and giraffes have the same number of bones in the necks, but the vertebrae in a giraffe's neck are much, much larger.
58. The appendicular skeleton comprises the shoulder girdle, the arm, wrist and hand bones, the pelvic girdle and the leg, ankle and foot bones.
59. Shoulder bone is formed by collar bone at the front and the shoulder blade at the back.
60. The shoulder bone encloses a socket. Cavity into which fixes the ball of the upper arm. This fooms a ball and socket joint. This girdle is also called as pectoral girdle.
61. Pelvic bone is also called as pelvic girdle.
62. Arm bone is
    - ❖ Humerus - Upper arm
    - ❖ Ulna - Fore arm
    - ❖ Carpals - Wrist
    - ❖ Metacarpals - Palm
    - ❖ Phalanges - Fingers
63. Leg bone is
    - ❖ Femur
    - ❖ Tibia
    - ❖ Fibula
    - ❖ Tarsals
    - ❖ Metatarsals
    - ❖ Phalanges
64. Knee is covered by a cap like structure called as patella or a knee cap.
65. Femur makes up the thigh bone.
66. Leg is made up of tibia and fibula.
67. There are muscles in the root of your hair.
68. It takes 17 muscles it smile and 42 muscles to brown.
69. The hardest working muscle is in eye.
70. Muscles aften work in pairs which work against each other. These are called antagonistic pairs.
71. The muscles in the upper arm are the biceps and triceps.
72. The radial muscles make the pupil of the eye wider.
73. The circular muscles make the pupil smaller.

74. Types of muscles
    - ❖ Straited or skeletal muscles or voluntary muscles.
    - ❖ Unsaturated or smooth muscles of involuntary muscles.
    - ❖ Cardiac muscles.
75. The biceps muscle in the front of the upper arm is a flexer.
76. The triceps muscle at the back of the upper arm, is an extensor.
77. Types of muscles

Muscle	Location	Characteristics
Striated skeletal / voluntary muscle	Attached to bones found in arms, legs, neck.	Multicellular, unbranched, lateral.
Non - striated, smooth involuntary muscle	Attached to soft parts of the body like blood vessels, iris, bronchi and the skin.	Single, central nucleus involuntary.
Cardiac muscle	Heart	Branched 1 - 3 (Central nuclei involuntary).

Exercise

Choose the correct answer:

1. Match:

i)	**Cervical vertebrae**	**-**	**a) 3**
ii)	**Thoracic vertebrae**	**-**	**b) 7**
iii)	**Lumbar vertebrae**	**-**	**c) 12**
iv)	**Sacrum vertebrae**	**-**	**d) 5**

1) i) b ii) d iii) c iv) a
2) i) b ii) c iii) d iv) a
3) i) c ii) b iii) d iv) a
4) i) d ii) b iii) c iv) a

2. _____ protects the brain.

a) Skull b) Ribs
c) Vertebral column d) Sternum

3. The body of cockroach contains material is

a) Chitin b) Setae c) Caudal d) Pseudopodia

4. Skull is formed by _____ bones.

a) 22 b) 14 c) 8 d) 16

5. Number of free floating ribs are

a) 2 b) 4 c) 3 d) 6

8th STD

17 Reaching The Age Of Adolescence

SCIENCE

1. Growing up is a natural process that takes place in all living organisms.
2. All living organisms grow up to maturity which is the ability to repsond to a particular environment.
3. This period starts at the age of about 13 and ends at the age of 19 (Commonly known as teenage)
4. 'Adolescence' meaning 'to grow' or 'grow to maturity'.
5. The average age for the onset of puberty is 10 or 11 for girls and 12 or 13 for boys.
6. The male sex glands, testes release the testosterone and the female sex gland the ovaries release the oestrogen.
7. Changes in body size it usually begins at the age of 10 to 12 in girls and 12 to 13 in boys.
8. It is almost complete at around the age of 17 to 19 in girls and 19 to 20 in boys.
9. During adolescence both boys and girls add around 23 cm to 26 cm in the height.
10. The average weight gain during this period is about 17 kg to 19 kg.
11. The size of the uterus and the weight of the ovaries increase during this time.
12. The secondary sex characters are regulated by the hormones the testosterone.
13. The secondary sex characters are regulated by the hormones the estrogen secreted byt he ovaries of the females.
14. The growing voice box in boys can be seen as a protruding part of the throat called 'Adam's apple'.
15. Secondary sex characteristics in boys and girls.

Girls	Boys
Height and weight increase.	Height and weight increase.
Fatty and subcutaneons tissues develop.	Muscles develop.
Hip broadens	Shoulder broadens
Hair grows in arm pits and pubic area.	Hair grows in the arm pits and pubic area, and facial hair also appears.
Voice becomes shrill.	Voice break takes place due to lengthening of vocal card and enlarging of larynx.

16. In the male it stimulates the interstitial (Leydig) cells of testes and the secretion of testosterone.
17. FSH in the female influences the development of the Graffian follicle and secretion of estrogens.
18. Prolactin or Lactogenic hormone is male secretion during lactation.

19. Oxytocin hormone causes expulsion of milk from the breast.
20. In females, the reproductive phase of life begins at puberty (10 to 12 years of age) and generally lasts till the age of approximately 45 to 50 years and in male.
21. In males, the reproductive phase it is from the age of 13 to life long.
22. The first menstrual flow begins at puberty and is termed menarche.
23. In a 28 days cycle ovulation occurs about day 14.
24. One ovum matures and is released by one of the ovaries once in about 28 to 30 days.
25. After ovulation the ovum reaches the fallopian tube and fertilization takes place.
26. Parturition - lasts for 280 days.
27. The corpus luteum continues to grow and produces large amount of progesterone.
28. The unfertilized egg and the thickened lining of the uterus along with its blood vessels are shed off. This causes bleeding in women's reproductive tract which is called menstraution.
29. At 45 to 50 years of age, the menstrual cycle stops.
30. The reproductive phase of a women's life stoppage of menstruation is termed as 'menopause'.
31. Menstruation it takes about 3 to 5 days.
32. Balanced diet is very much important during adolescence.
33. There is an increase in skeletal mass and blood volume during adolescnce the body needs calcium, phosphorus and iron.
34. Calcium intake needs to be increased to prevent osteoporosis in later life.
35. Iodine helps to prevent thyroid gland related disease.
36. Iron plays an important role in the formation of blood.
37. Lack of iron in the diet results in anaemia.
38. Iron in their diet regularly to make up for the loss of blood during menstruation.
39. Get pimples on face because of increased activity of oil glands in the skin.

Exercise

Choose the correct answer:

1. Adolescence is the period between the life between _____ years of age.
a) 10 - 16 b) 11 - 17 c) 11 - 19 d) 11 - 20

2. Adam's apple is the growth of the
a) Tharynx b) Thyroid c) Larynx d) Parathyroid

3. Pimples are caused by a _____ glandular secretions.
a) Sweat b) Oil c) Sperm d) Ovum

4. _____ needs to prevent osteoporosis.
a) Potassium b) Phosphorus c) Iron d) Calcium

5. Menstrual period _____ age.
a) 30 - 35 b) 35 - 40 c) 40 - 45 d) 45 - 50