SCHOOL EDUCATION DEPARTMENT
VIRUDHUNAGAR DISTRICT

SLOWLEARNERS GUIDE

10

SCIENCE

2022 - 23

Chief
Tmt. A Gnanagowri, M.Sc., B.Ed., M.Phil., PGDCA.,
Chief Educational Officer, Virudhunagar.

Administrators

Tmt. T Mahalakshmi, M.Sc., B.Ed., M.Phil.,
District Educational Officer
(Secondary Education)

Tmt. A Pandichelvi, M.Sc., M.Ed.,
District Educational Officer
(Private Schools)

Mr. C Raja, M.Sc., M.Ed., M.Phil.,
District Educational Officer [Incharge]
(Secondary Education)

Integrator

Mr. Senthilkumar, M.A., M.Ed.,
Hedmaster
Govt. High School, Thombakulam.

Faculty Panel

Mr. D Ramakrishnan, M.Sc., B.Ed., M.Phil.,
Graduate Teacher(Science)
Govt. Hr. Sec. School,
Sankaralingapuram.

Mr. B Balamurugan, M.Sc., B.Ed.,
Graduate Teacher(Science)
Govt. Hr. Sec. School,
Rajapalayam.

Mr. R Jeyapal M.Sc., M.Ed.,
Graduate Teacher(Science)
Govt. Girls Hr. Sec. School,
Panthalkudi.

Mr. P Manimaran, M.Sc., B.Ed., M.Phil.,
Graduate Teacher(Science)
Govt. High School,
Veeracholan

Mr. S Pudhiaraja, M.Sc., B.Ed., M.Phil.,
Graduate Teacher(Science)
Govt. High School,
Udaiyanampatti.

Mr. S Santhana krishnan, M.Sc., M.Ed.,
Graduate Teacher(Science)
Govt. High School,
S Kallupatti.

Mr. R Kasipandian, M.Sc., B.Ed.,
Graduate Teacher(Science)
Govt. Hr. Sec. School,
Mutharpatti.

10th SCIENCE – EXPECTED 1 MARK QUESTIONS

1) To project the rockets which of the following principles is / (are) required?
   a) Newton's third law of motion   b) Newton's law of gravitation
   c) Law of conservation of linear momentum   **d) both a and c**

2) In which of the following sport the turning of effect of forced used
   a) swimming   b) tennis   **c) cycling**   d) hockey

3) One kilogram force equals to
   a) 9.8 dyne   b) 9.8 x 10^{4}N   **c) 98 x 10^4 dyne**   d) 980 dyne

4) The eye defect 'presbyopia' can be corrected by
   a) convex lens   b) concave lens   c) convex mirror   **d) Bi focal lenses**

5) Where should an object be placed so that a real and inverted image of same size is obtained by a convex lens
   a) f   **b) 2f**   c) infinity   d) between f and 2f

6) The value of universal gas constant
   a) 3.81 Jmol^{-1} K^{-1} b) 8.03 Jmol^{-1} K^{-1} c) 1.38 Jmol^{-1} K^{-1} **d) 8.31 Jmol^{-1} K^{-1}**

7) SI unit of resistance is------   a) mho   b) joule   **c) ohm**   d) ohm meter

8) Kilowatt hour is the unit of   a) resistivity   b) conductivity   **c) electrical energy**   d) electrical power

9) When a sound wave travels through air, the air particles
   a) vibrate along the direction of the wave motion   b) vibrate but not in any fixed direction
   c) vibrate perpendicular to the direction of the wave motion   d) do not vibrate

10) The frequency which is audible to the human ear is
    a) 50 kHz   **b) 20 kHz**   c) 15000 kHz   d) 10000 kHz

11) Unit of radio activity is -------   a) Roentgen   b) Curie   c) Becquerel   **d) all the above**

12) Artificial radioactivity was discovered by
    a) Becquerel   **b) Irene Curie**   c) Roentgen   d) Neils Bohr

13) -------- isotope is used for the treatment of cancer
    a) Radio Iodine   **b) Radio Cobalt**   c) Radio Carbon   d) Radio Nickel

14) -------- aprons are used to protect us from gamma radiations
    a) Lead oxide   b) Iron   **c) Lead**   d) Aluminium

15) Which of the following is a triatomic molecule?
    a) Glucose   b) Helium   **c) Carbon di oxide**   d) Hydrogen

16) The gram molar mass of oxygen molecule is   a) 16g   b) 18g   **c) 32g**   d) 17g

17) The value of Avogadro's number is ---------
    a) 6.023x10^{23}   b) 6.023x10^{-23} c) 3.0115x10^{23} d) 6.023x10^{23}

18) The number of periods and groups in the periodic table are -----------.
    a) 6,16   b) 7,17   c) 8,18   **d) 7,18**

19) --------- is an important metal to form amalgam.   a) Ag   **b) Hg**   c) Mg   d) Al

20) --------- group contains the number of halogen family.   **a) 17th**   b) 15th c) 18th d) 16th

21) Chemical formula for rust is ---------.
    a) FeO.xH$_2$O   b) FeO$_3$.xH$_2$O   **c) Fe$_2$O$_3$.xH$_2$O**   d) FeO

22) The number of components in a binary solution is -------.   **a) 2**   b) 3   c) 4   d) 5

23) Which of the following is the universal solvent?
    a) Acetone   b) Benzene   **c) Water**   d) Alcohol

24) Solubility of NaCl in 100 ml water is 36 g. If 25 g of salt is dissolved in 100 ml of water how much more salt is required for saturation ---------.   a) 12g   **b) 11 g**   c) 16g   d) 20g

25) The pH of a solution is 3. Its (OH$^-$) concentration is
    a) 1 x 10^{-3} M   b) 3 M   **c) 1 x 10^{-11} M**   d) 11 M

26) The secondary suffix used in IUPAC nomenclature of an aldehyde is --------.
    a) – ol   b) – oic acid   **c) – al**   d) – one

27) Rectified spirit is an aqueous solution which contains about ---------- of ethanol.
    a) 95.5%   b) 75.5%   c) 55.5%   d) 45.5%

28) Which of the following are used as anaesthethics?
    a) Carboxylic acids   **b) Ethers**   c) Esters   d) Aldehydes

29) TFM is soaps represents --------- content in soap.
    a) mineral   b) vitamin   **c) fatty acid**   d) carbohydrate

30) The endarch condition is the characteristics feature of
    a) root   **b) stem**   c) leaves   d) flower

31) Which is formed during anaerobic respiration
    a) Carbohydrate   **b) Ethyl alcohol**   c) Acetyl CoA   d) Pyruvate

32) The brain of leech lies above the
    a) Mouth   b) Buccal Cavity   **c) Pharynx**   d) Crop

33) The body of the leech has
a) 23 segments   **b) 33 segments**   c) 38 segments   d) 30 segments

34) Blood sucking nature are called as --------.
a) Oviparous   b) Viviparous   c) Ovoviviparous   **d) Saguivorous**

35) During transpiration there is loss of
a) Carbon di oxide   b) oxygen   **c) water**   d) none of the above

36) 'Heart of heart' is called   **a) SA node**   b) AV node   c) Purkinje fibres   d) Bundle of His

37) Vomiting centre is located in
a) medulla oblongata   b) stomach   c) cerebrum   d) hypothalamus

38) Node of Ranvier is found in   a) muscles   **b) axons**   c) dendrites   d) cyton

39) Which organ acts as both exocrine and endocrine gland
a) Pancreas   b) Kidney   c) Liver   d) Lungs

40) Which one is referred as "Master Gland"?
a) Pineal gland   **b) Pituitary gland**   c) Thyroid gland   d) Adrenal gland

41) Syngamy results in the formation of ---------.
a) Zoospores   b) Conidia   **c) Zygote**   d) Chlamydospores

42) Estrogen is secreted by
a) Anterior pituitary   b) Primary follicle   **c) Graffian follicle**   d) Corpus luteum

43) Which one of the following is an IUCD?
a) Copper – T   b) Oral pills   c) Diaphragm   d) Tubectomy

44) The centromere is found at the centre of the ---------- chromosome.
a) Telocentric   **b) Metacentric**   c) Sub – Metacentric   d) Acrocentric

45) The -------- units form the backbone of the DNA.
a) 5 carbon sugar   b) Phosphate   c) Nitrogenous bases   **d) Sugar phosphate**

46) Okasaki fragments are joined together by ------------.
a) Helicase   b) DNA polymerase   c) RNA primer   **d) DNA ligase**

47) The 'use and disuse theory' was proposed by ----------.
a) Charles Darwin   b) Ernst Haeckel   **c) Jean Baptiste Lamarck**   d) Gregor Mendel

48) The term Ethnobotany was coined by
a) Khorana   **b) J.W.Harsbberger**   c) Ronald Ross   d) Hugo de Vries

49) Pusa Komal is a disease resistant variety of ---------.
a) sugarcane   b) rice   **c) cow pea**   d) maize

50) We can cut the DNA with the help of
a) scissors   **b) restriction endonucleases**   c) knife   d) RNAase

51) World 'No Tobacco Day' is observed on
a) May 31   b) June 6   c) April 22   d) October 2

52) Cancer of epithelial cells is called
a) Leukemia   b) Sarcoma   **c) Carcinoma**   d) Lipoma

53) Polyphagia is a condition seen in
a) Obesity   **b) Diabetes mellitus**   c) Diabetes insipidus   d) AIDS

54) A renewable source of energy is
a) petroleum   b) coal   c) nuclear fuel   **d) trees**

55) A cheap, conventional, commercial and inexhaustible source of energy is
a) hydro power   b) solar energy   c) wind energy   d) thermal energy

2 Mark

1. What are the types of inertia?

   The resistance to change in its state of rest or of uniform motion.

   Types: 1. Inertia of rest 2 Inertia of motion 3. Inertia of direction.

2. Classify of the types of based on their application?

   1.Like parallel forces

   2.Unlike parallel forces

3. State Newton's second law of motion?

   The force acting on an object is directly proportional to the rate of change of momentum   .F= ma

4. While catching a cricket ball the fielder lowers his hands backwards. why?

   Longer interval of time, resulting in lesser impulse on his hand.

5. State Snell'law.

   $\frac{\mu_2}{\mu_1} = \frac{Sin\ i}{Sin\ r}$

   The ratio of the sine of angle of incedents and the sine of angle of refraction is equal to the ratio of the   afractive indices of the media.

6. Draw the a ray diagram to show the image formed by a convex lens when the object is placed between points F and 2F ?
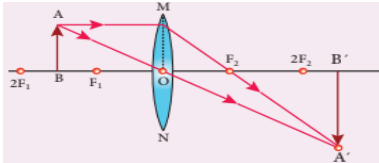
7. What is the power of accommodation of eye ?

   The ability of eye lens to focus nearby as well as the distant objects.

8. Why does the sky appears in blue colour?

   According to Rayleigh's law, the blue colour with shorter focal length scatters to a greater extent.

9. Why are traffic signals red in colour?

   As the red light has highest wavelength, it scatters the least and travels longer distance.

10. What are causes of "Myopia"?

    1. Lengthening of eye ball

    2. shortening of focal length

11. Define one calorie

    The amount of heat energy required to rise the temperature of 1 gram of   water   through $1\,^{\circ}C$

12. State Boyle's law

    At constant temperature the volume of a fixed mass of gas is inversely proportional to its pressure.

    P α 1 / V

13. State charle's law (law of volume)

    At constant pressure the volume of a gas is directly proportional to the temperature of the gas.

    V α T

14. State Avogadro's law:

    At STP, the volume of a gas is directly proportional to number of atoms or molecules present in it

    V α n

15. State Ohm's law

    At constant temperature, the steady current flowing through a conductor is directly proportional to the potential difference between two ends of the conductor. V = IR

16. Differentiate Electric potential and Electric potential difference?

    Electric potential :

    The electric potential at a point is defined as the amount of work done in moving a unit positive charge   from infinity to that point against the electric force.

    Electric potential difference:

    The electric potential difference between two points is defined as the amount of work done in moving a unit positive charge from one point to another point against the electric force..

17. Distinguish between the resistivity and conductivity of a conductor

<u>Resistivity</u> The electrical resistivity of a material is defined as the resistance of a conductor of unit length and unit area of cross section. Its unit is ohm metre.

<u>Conductivity</u> The reciprocal of electrical resistivity of a material is called its electrical conductivity Its unit is ohm^{-1} $metre^{-1}$.

18. What is the audible range of frequency?

Frequency between 20Hz to 20,000Hz

19. State two conditions necessary for hearing an echo?

The time interval between the original sound and echo must be 0.1 s. The minimum distance between the source and the reflecting surface must be 17.2meter

20. Name three animals which can hear ultrasonic vibration

Mosquitoes, Dogs, Bats Dolphins.

21. Explain why, the ceiling of concert halls are curved.

Due to the multiple reflection of sound waves from the curved surface, its intensity changes. Hence the audience can hear the sound clearly.

22. Define one roentgen:

The quantity of radioactive substance which produces a charge of 2.58×10^{-4} coulomb in 1 kg of air at STP

23. State Soddy and Fajan's displacement law

α decay : In daughter nuclei 4 units of mass number and 2 units of atomic number will be decreased.

β decay : in daughter nuclei same mass number and atomic number will be increased by 1 unit.

` γ decay : No change in atomic number and mass number

24. Give the Functions of control rods in a nuclear reactor.

To control the neutrons by absorbing in order to have sustained chain reaction.

25. Write the three features of natural and artificial radioactivity Activity

Natural Radio Activity	Artificial Radio Activity
Spontaneous Process	Induced Process
Cannot be controlled	Can be controlled
Atomic number more than 83	Atomic number less than 83

26. Give any uses of radio isotopes in the field of agriculture.

1. To increase the production of crops using radio phosphorous 2. To kill the insects and parasites

27. Define Atomicity.

The number of atoms present in the molecule is called atomicity

28. Give any 2 examples for hetero diatomic molecules.

a. Carbon monoxide (CO) b. Hydrogen Chloride (HCl)

29. State two conditions necessary for rusting of iron.

a) Moisture b) Water c) Oxygen

30. What is an alloy? Give example

An alloy is a homogeneous mixture of two or more metals or with certain non- metallic elements. Eg: Brass

31. What is an amalgam ? Give example

An amalgam is an alloy of mercury with another metal Eg: **Silver tin amalgam** is used for dental filling.

32. What is rust?

When iron is exposed to moist air, it forms a layer of brown hydrated ferric oxide on its surface. It is called rust..

33. What is meant by binary solution?

A solution consisting of two components, a solute and a solvent is called binary solution.

34. What is aqueous and non aqueous solution? Give an example

The Solution in which water acts as a solvent is called an aqueous solution.

eg: Common salt in water

The Solution in which any liquid, other than water acts as a solvent is called non-aqueous solution.

eg: Sulpur dissolved in CS_2

35. The aquatic animals live more in cold region why?

   The solubility of oxygen in water is more at low temperature.

36. a) What happens when $MgSO_4 \cdot 7H_2O$ is heated? Write the appropriate equation?

   It loses of water molecules $MgSO_4 \cdot 7H_2O \rightleftharpoons MgSO_4 + 7H_2O$

37. What is hydrated salts?

   Salts with water of crystallization.

38. What is Combination reactions?

   A reaction in which two or more reactants combine to form a compound.

   $A + B \longrightarrow AB$ Eg: $C + O_2 \longrightarrow CO_2$

39. How is ethanoic acid prepared from ethanol? Give the chemical equation

   Ethanoic acid is prepared by the oxidation of ethanol in the presence of alkaline potassium
   permanganate or acidified potassium dichromate.

$$KMnO_4/OH^-$$

   CH_3CH_2OH -------------------------- $CH_3COOH + H_2O$
   Ethanol   2 (O)   Ethanoic acid
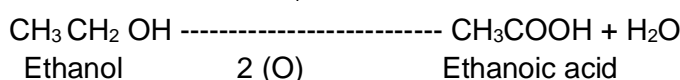
40. What does TFM mean?

    TFM means Total Fatty Matter. This indicates the quality of soap.

41. What is photosynthesis? Where does this take place in the cell?

   The process by which plants make their own food is called photosynthesis. It takes place in the
   chloroplasts of the leaves.

42. Why light reaction must take place before dark reaction during photosynthesis?

   Because the ATP and NADPH required for the dark cycle are formed in the light reaction.

43. Write the overall equation for photosynthesis

   Carbon Dioxide + Water $\longrightarrow$ Glucose + Water + Oxygen

   $6 CO_2 + 12H_2O \longrightarrow C_6H_{12}O_6 + 6H_2O + 6O_2$.

44. Differentiate between aerobic respiration and anaerobic respiration

Aerobic respiration	Anaerobic respiration
Need of oxygen	No need of oxygen
Takes place in Plants and animals	Takes place in Bacterium

45. What is Respiratory quotient ?

   Respiratory quotient is the ratio of volume of carbon dioxide liberated and the volume of oxygen
   consumed during respiration. It is expressed as RQ = Volume of CO_2 liberated

                                         Volume of O_2 consume

46. Write a short note on mesophyll.

   i) The tissue present between the upper and lower epidermis is called mesophyll.

   ii) It is differentiated into Pallisade parenchyma and Spongy parenchyma

47. Write the dental formula of rabbit.

    2033/1023.

48. How is diastema formed in rabbit?

   The gap in between the incisors and premolar is called diastema.

49. Why is the colour of the blood red ?

   The RBCs impart red colour to the blood due to presence of respiratory pigment haemoglobin.

50. What is the importance of heart valves?

    Heart valves regulate blood flow.

    It helps blood flow in one direction and prevent back flow.

51. Who discovered the Rh factor? Why is it called that?

   Landsteiner and Wiener discovered the Rh factor. It was called so because it was discovered from
   the blood of the Rhesus monkey.

52. Give examples of synthetic auxins.

   Artificially produced auxins with properties like auxins are called synthetic auxins.

   Example: 2,4 D

53. What are chemical messengers?

Hormones which transmit messages. These are secreted by the endocrine system.

54. What is bolting? How can it be encouraged?

Treatment of rosette plants with gibberellin induces sudden shoot elongation followed by flowering. This is called bolting.

55. Why thyroid hormone is called "personality hormone"?

Thyrod hormone is essential for normal, physical , mental and personality development.

56. Define triple fusion.

One sperm fuses with the egg and forms a diploid zygote. The other sperm fuses with secondary nucleus to form triploid endosperm. This is called triple fusion.

57. How can menstrual hygiene be maintained during menstrual days?

i) Use of warm water to clean genitals. ii) Wearing loose clothing.

58. What is colostrum? How is milk production hormonally regulated ?

i) The milk produced from the breast during the first 2 to 3 days after child birth is called colostrum.

ii) It is regulated by oxytocin.

59. What are allosomes?

Chromosomes that determine sex of an individual. They are also called as Sex chromosomes or heterosome.

60. What are Ogasaki fragments?

Small fragments formed on the lagging strand of DNA.

61. What is evolution?

Evolution is the gradual change occurring in living organisms over a period of time.

62. Differentiate the following

Tissues	Monocot root	Dicot root
Number of Xylem	Polyarch	Tetrarch
Secondary growth	Absent	Present
Pith	Present	Absent

63. .Define genetic engineering.

Genetic engineering is the manipulation and transfer of genes from one organism to another organism.

64. Name two maize cultivars high in lysine amino acid?

Shakti, Ratna, Proteina

65. Define Ethnobotany and write its importance.

Ethnobotany is the study of a region's plants and their practical uses through the traditional knowledge of the local culture of people. ii) It provides traditional uses of plant.

66. Distinguish: Somatic Gene therapy of body cells and Germ line Gene therapy

Somatic Gene therapy	Germ line Gene therapy
Replacement of defective Gene in Somatic cells	Replacement of defective Gene in Germcells
Do not be carried to the next generation	Carried to the next generation

67. What are the causes of obesity?

1. Genetic factors 2. Physical inactivity 3. Dietary habits 4. Endocrine factors

68. How does a cancer cell differ from a normal cell?

Cancer cell	Normal cell
Uncontrolled cell division	Controlled cell division
Destroy surrounding tissue	Do not destroy surrounding tissue

69. How is e-waste generated?

Electrical and electronic devices which are out dated or spoiled or non repairable are called E – wastes.

70. State the channels through which HIV can be transmitted?

Having sex with an HIV infected person,

a. Transmission from infected mother to child through Placenta.

b. Use of contaminated needles and syringes.

71. What is scratch?

A Software used to create animations, cartoons and games easily.

72. Differentiate . Mass, weight

S.No	. Mass	weight
1.	Amount of material	Magnitude of gravitational force
2.	The unit is kilogram	The unit is Newton
3.	Scalar quantity	Vector quantity
4.	Does not change from place to place	It changes from place to place

73.

74. Differentiate convex lens and concave lens

	Convex lens	Concave lens
1.	Converging lens	Diverging lens
2.	Produces real images	Produces virtual images

75. Distinguish between ideal gas and realgas.

IDEAL GAS	REAL GAS
Atoms or molecules of a gas do not interact with each other,	Atoms or molecules of a gas interact with each other,
The interatomic or intermolecular forces of attraction is less.	The interatomic or intermolecular forces of attraction is high.

76. Writethedifferencebetweenthesound and light waves

S.No.	Sound waves	Light waves
1	Medium is required for the propagation	Mediumis not required for the propagation
2	Sound waves are longitudinal waves	Light waves are transverse waves

77. Write thedifference between atoms and molecules.

S.No.	Atom	Molecule
1.	An atom is the smallest particle of an element.	Amolecule is the smallest particle of an element or compound.
2.	Atom does not exist in free state	Molecule exists in free astate.

78. Differentiate Soap and detergent

S.No.	Soap	Detergent
1	Long chain fatty acids.	Branch acids
2.	Prepared from animal fats (or) vegetable oils	Prepared from crude oil.
3.	Scum formed	No Scum formed
4	Poor foaming.	Rich foaming
5	Bio - degradable.	Non–biodegradable.

79. How do you differentiate homologous organs from analogous organs**?**

Homologous organs	Analogousorgans
Similar developmental pattern	Different developmental pattern
Eg.Humanhand,and the front leg of a cat.	Eg.Bat and Bird
Similar pattern	Different pattern
Looks same	Looks different
Multiple functions	Single function

80. Differentiate between inbreeding and outbreeding

Inbreeding	Outbreeding
Close breed	Unrelated breed
Strength less	Strength more
Recessive character	Dominant character
Productivity less	Productivity high

81. Give the applications of Universal law of gravitation?
    a. Helps in discovering new stars and planets.
    b. Helps to predict the path of the astronomical bodies.

82. State the applications of convex lenses
    camera lenses , magnifying lenses , making microscope, telescope and slide projectors and to correct hypermetropia

83. State the applications of concave lenses
    1. as eye lens of 'Galilean Telescope' 2. in wide angle spy hole in doors. 3. to correct the 'myopia'

84. State the applications of avogadro's law
    a. It explains Gay-Lussac's law.
    b. To determination of atomicity.
    c. To derive Molecular formula of gases can be derived using Avogadro's law
    d. To determine gram molar volume.
    e. To determine the relation beween Molecular mass and vapour densiy.

85. Write the Uses of Aluminium ?
    Household utensils, electrical cable industry,making parts of aircrafts and machine parts

86. Write the Uses of Copper?
    a. manufacturing electric cables and other electric appliances.
    b. To make utensils, containers, calorimeters and coins,
    c. in electroplating.
    d. To make gold and jewels

87. State the Uses of ethanol ?
    Antiseptic, Coolent , Solvent, Medicine, Sweetner and to prepare rectified spirit,

88. State the uses fo Ethanoic acid ?
    a. in the manufacture of plastic
    b. in making dyes, pigments and paint.
    c. in printing on fabrics.
    d. as a laboratory reagent.
    e. for coagulating rubber from latex.

89. What are the medical uses of Leech?
    To make high blood pressure medicine
    To accelerate blood flow To prevent blood clotting
    To correct circulatory system deficiency

90. What are the uses of wind energy?
    Environment friendly. Unpolluted, Low maintenance cost. Inexpensive, renewable energy.

91. What are the practical applications of DNA finger printing technology?
    To find evidence, to identify criminals, to identify controversial children, to learn about genetic differences, to learn about evolution.

92. Match the fallowing

Newton's I law	Propulsion of a rocket
Newton's II law	stable equilibrium of a body
Newton's III law	Law of force
Law of conservation of linear momentum	Flying nature of bird

Answer

Newton's I law	stable equilibrium of a body
Newton's II law	Law of force
Newton's III law	Flying nature of bird
Law of conservation of linear momentum	Propulsion of a rocket

93. Match the fallowing

Electric current	volt
Potential difference	Ohm meter
Specific resistance	watt
Electrical power	joule
electrical energy	ampere

Answer

Electric current	Ampere
Potential difference	Volt
Specific resistance	Ohm meter
Electrical power	watt
Electrical energy	Joule
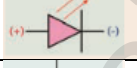
94.Match the fallowing

Infrasonic	Compressions
Echo	22 kHz
Ultrasonic	10Hz
High pressure region	Ultrasonography
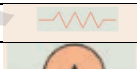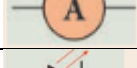
Answer

Infrasonic	10Hz
Echo	Ultrasonography
Ultrasonic	22 kHz
High pressure region	Compressions

95. Match the fallowing

Resistor	
Ammeter	
LED	
Ground connection	

Answer

Resistor	
Ammeter	
LED	
Ground connection	

97. Match the fallowing

Fuel	Lead
Moderator	Heavywater
Coolant	Cadmiumr ods
Shield	Uranium

Answer

Fuel	Uranium
Moderator	Heavywater
Coolant	Cadmium rods
Shield	Lead

98. Match the fallowing

Co– 60	Age of soil
I– 131	Function of heart
Na – 11	Leukemia
C– 14	Thyroid disease

Answer

Co – 60	Leukemia
I – 131	Thyroid disease
Na– 11	Function of heart
C – 14	Age of soil

99. Match the fallowing

Soddy Fajan	Natural radioactivity
Irene Curie	Displacement law
Henry Bequerel	Mass energy equivalence
Albert Einstein	Artificial Radioactivity

Answer

SoddyFajan	Displacemen tlaw
IreneCurie	Artificial Radioactivity
HenryBequerel	Natural radioactivity
Albert Einstein	Mass energy equivalence

100. Match the fallowing

Mono atomic molecule	O_2, N_2
Diatomic molecule	He,
Tri atomic molecule	P_4
Tetra atomic molecule	O_3

Answer

Mono atomic molecule	He,Ne
Diatomic molecule	O_2, N_2
Tri atomic molecule	O_3
Tetra atomic molecule	P_4

101. Match the fallowing

Bluevitriol	$CaSO_4.2H_2O$
Gypsum	CaO
Deliquescence	$CuSO_4.5H_2O$
Hygroscopic	NaOH

Answer

Bluevitriol	$CuSO_4.5H_2O$
Gypsum	$CaSO_4.2H_2O$
Deliquescence	NaOH
Hygroscopic	CaO

102 Match the fallowing

Alcohol	- COOH
Aldehyde	O ‖ − C −
Ketone	- CHO
Carboxylic acid	- OH

Answer

Alcohol	- OH
Aldehyde	- CHO
Ketone	O ‖ − C −
Carboxylic acid	- COOH

103. Match the fallowing

Symplastic pathway	Leaf
Transpiration	Plasmodesmata
Osmosis	Pressure in xylem
Root pressure	Pressure gradient

Answer

Symplastic pathway	Plasmodesmata
Transpiration	Leaf
Osmosis	Pressure gradient
Root pressure	Pressure in xylem

Kindly Send me Your Key Answer to Our email id - Padasalai.net@gmail.Com

104.

Nissil'sgranules	Forebrain
Hypothalamus	Peripheral Nervous system
Cerebellum	Cyton
Schwann cell	Hindbrain

Answer

Nissil'sgranules	Cyton
Hypothalamus	Forebrain
Cerebellum	Hindbrain
Schwann cell	Peripheral Nervous system

DETAILED SLOW LEARNERS QUESTIONS – 4 AND 7 MARKS – PHYSICS

1. What are the types of inertia? Give an example for each type.

Inertia of rest :

The resistance of change its state of rest – leaves falling down.

Inertia of motion :

The resistance of change its state of motion – Long jump.

Inertia of direction :

The resistance of change its state of direction – Lean in sharp turn.

1.   Describe rocket propulsion.

Laws : Newtons third law, law of conservation of linear momentum.

Filled with fuel.

Fuel is burnt.

Project forward due to momentum.

Fuel get decreases.

Mass decreases.

Velocity increases and reaches escape velocity.

Rocket reaches the atmosphere.

2.   List any five properties of light.

Travels in straight line.

Travels like a wave.

Travels in vacuum.

Does not need medium.

It is form of energy.

Violet – lower wavelength.

Red – higher wavelength.

3.   Differentiate eye defects : Myopia and Hypermetropia

Myopia	**Hypermetropia**
Eye ball lengthens.	Eye ball shortens.
Focal length decreases.	Focal length increases
We cannot see far object.	We cannot see near object.
Rectify by concave lens.	Rectified by convex lens.

4.   Derive the ideal gas equation.

Boyle's Law   **Charles Law**   **Avogadro's Law**

PV = Constant $\frac{V}{T}$ = Constant $\frac{V}{n}$ = Constant

$\frac{PV}{nT}$ = Constant

$\frac{PV}{\mu N_A T} = K_B$

$PV = K_B \mu N_A T$

$PV = RT$

5.   a.What is meant by electric current?

     b. Name and define its unit?

     c. Which instrument is used to measure the electric current?

     How should it be connected n a circuit?

a)   Rate of flow of charge. $I = \frac{Q}{t}$

b)   Ampere.

     1 coulomb of charge flowing for 1 sec through a conductor is 1 ampere.

c)   Ammeter.

     Connected in series.

6.   a) What do you understand by the term 'Ultrasonic Vibration'?

     b) **State three uses of ultrasonic vibrations?**

     c) **Name any three animals which can hear ultrasonic vibrations?**

a)   Sound waves > 20000Hz frequencies.

b)   Sonar – To find the depth of sea.

     Medicine – To find the growth of fetus.

     Bats – To find the prey.

c)   Dog, Dolphin, Bat, Mosquito.

7. a) What is an echo?
   b) What are the medical applications of echo?
   c) State two conditions necessary for hearing an echo?

   a) Sound waves repeated again and again.
   Ex: Mountains and caves.

   b) Communication between animals.
   To find the growth of fetus.
   To find the velocity of sound.

   c) Minimum distance = 17.2m.
   Minimum time gap = 0.1s.

8. Mention two cases in which no Doppler effect in sound?
   b) Mention the applications of Doppler effect?

   a) **Both S and L**
   At rest.
   Mutually perpendicular.
   Constant distance.
   S at centre and L moving.

   b) **Doppler - Applications**
   To find the speed of vehicle.
   To find the distance of satellite.
   RADAR – To find speed of aeroplane.
   SONAR – To find place of submarines and water animals

10. Compare the properties of alpha, beta and gamma radiations?

Properties	Alpha	Beta	Gamma
Charge	Positive	Negative	No
Ionising power	High	Less	Very Less
Penetrating power	Less	High	Very High
Electric/magnetic effect	Deflected	Deflected opposite	Not deflected
Nature	He nucleus	Electrons	electromagnetic waves

11. **Give the salient features of "Modern atomic theory".**

✦ An atom is no longer indivisible

✦ The same element may have different atomic mass

✦ Different elements may have same atomic masses.

✦ Atoms of one element can be transmuted into atoms of other.

✦ Atom is the smallest particle.

   $E=mC^2$

12. **Write the methods of preventing corrosion.**

i) **Alloying:** Alloying of metals..

a) **Galvanization :** Coating with zinc.

b) **Electroplating:** coating by passing electric current.

c) **Anodizing :** electro chemical process

d) **Cathodizing:** Coating with Manganese

13. **In what way hygroscopic substances differ from deliquescent substances.**

Hygroscopic	Deliquescent
When exposed to heat atmosphere at ordinary temperature ,they absorb moisture and do not dissolve.	When exposed to the atmospheric air at ordinary temperature, they absorb moisture and dissolve.
change its physical state on exposure to air.	change its physical state on exposure to air.
amorphous solids or liquids.Ex. Silica Gel	crystalline solids. Ex.Calciumchloride

14.   Differentiate reversible and irreversible reactions.

REVERSIBLE REACTION	IRREVERSIBLE REACTION
can be reversed	can not be reversed.
Bidirectional	Unidirectional.
attains equilibrium.	Do not attained equilibrium.
reactants cannot be converted completely into products.	Reactants can be converted completely into products.
Slow.	Fast.

15.   Aerobic and Anaerobic respiration

Aerobic Respiration	Anaerobic Respiration
1. takes place in plants and animals.	1. takes place in Yeast and Bacteria.
2. Oxygen is utilized for respiration.	2. Oxygen is not utilized for respiration.
3. Glucoseis completely oxidized.	3. Incomplete oxidation of Glucose takes place.
4. More energy is produced.(38ATP)	4. Less energy is produced.(2ATP)
5. The end products are CO_2, H_2O and Energy	5. The end products are Ethanol or Lactic acid, CO_2 and Energy.

16.   List out the parasitic adaptations in leech.

i)   Blood is sucked bypharynx.

ii)   Anterior and posterior suckers help the leech attacks itself to the body of the host.

iii)   The three jaws inside the mouth,causes apainlessY–shaped wound in the skin of the host.

iv)   The salivary glands produce hirudin which does not allow the blood to
    coagulate.Thus,a continuous supply of the blood is maintained.

v)   Blood is stored in the crop.It gives nourishment to the leech for several months.

17. **Enumerate the functions of blood.**

i)   Transport of respiratory gases

ii)   Transport of digested food materials

iii)   Transport of hormones.

iv)   Transport of nitrogenous excretory products

v)   It is involved in protection of the body and defense against diseases.

vi)   Regulates temperature, water balance,pH.

18.   What is transpiration ? Give the importance of transpiration.

Transpiration is the **evaporation of water** in plants throughs to maintain the leaves.

Importance of Transpiration

a.   Creates transpirationl pull for transportt ofwater.

b.   Supplies water for photosynthesis.

c.   Transports minerals froms oil to all parts of the plant.

d.   Cools the surface of the leaves by evaporation.

e.   Keeps the cells turgid; hence, maintains their shape.

19.   Write the physiological effects of gibberellins.

Physiological effects of Gibberellins:

a.   Application of gibberellins on plants stimulate extraordinary elongation of in ternode.
     eg:Cornand Pea.

b.   Treatment of rosette plants with gibberellins induces sudden shoot elongation followed by
     flowering. This is called bolting.

c.   Gibberellins promote the production of male flowers in monoecious plants(Cucurbits).

d.   Gibberellins break dormancy of potato tubers.

e.   Gibberellins are efficient than auxins in inducing the formation of seedless fruit-Parthenocarpic
     fruits (Development of fruits without fertilization)eg:Tomato.

22.Where are estrogens produced? What is the role of estrogens in the human body?

Estrogens are produced by the Graafian follicles of the ovary.
Functions of estrogens:

- It brings about the changes that occur during puberty.
- It initiates the process of cogenesis.
- It stimulates the maturation of ovarian follicles in the ovary.
- It promotes the development of secondary sexual characters (breast development, high
  - Pitched voice etc).

23. How does Embryology support evolution?

✦ The study of comparative embryology of different animals,supports the concept of evolution.
✦ The embryos from fish to mammals are similar in their early stages of development.
✦ The differentiation of their special characters appear in the later stages of development.
✦ Studying these early stages in multiple animals can help us learn about how different species may have evolved through time.

24. Discuss the importance of biotechnology in the field of medicine.
 Using genetic engineering techniques medicinally important valuable proteins or polypeptides that form the potential pharmaceutical products for treatment of various diseases have been developed on a commercial scale.

 Pharmaceutical products developed by rDNA technique:

✦ Insulin used in the treatment of diabetes.
✦ Human growth hormone used for treating children with growth deficiencies.
✦ Blood clotting factors are developed to treat haemophilia.
✦ Tissue plasminogen activator is used to dissolve blood clots and prevent heart attack.
✦ Development of vaccines against various diseases like Hepatitis B and rabies.

25. Suggest measures to over come the problems of analcoholic.

✦ **Education and counselling:** Education and proper counseling will help the alcoholics to overcome their problems and stress,to accept failures in their life.

✦ **Physicalactivity:**Individuals undergoing rehabilitation should be channelized in to healthy activities like reading,music,sports,yoga and meditation.

✦ **Seeking help from parents and peer groups:** When a problematic situation occurs, the affected individuals should seek help and guidance from parents and peers. This would help them to share their feeling of anxiety,wrong doing and getrid of the habit.

✦ **Medical assistance:** Individual should seek help from psychologists and psychiatrists to get relieved from this condition and to leadarelaxed and peaceful life.
 Alcoholde-addiction and rehabilitation programmes are helpful to the individuals ot hat they could get Rid of the problem completelyand canleada normal and healthy life.

26. What are the contributing factors for Obesity?
i) Genetic factors
ii) Eating habits
iii) Physical inactivity

27. What are the harmful effects of alcohol to health?
Prolongeduse of alcoholde presses the nervous system, byacting as asedative andanalgesic substance.Some of the harmful effects are
i) Nerve cell damage resulting invarious mental and physical disturbances
ii) Lack of co-ordination of body organs
iii) Blurred or reduced vision,results in road accidents
iv) Dilation of blood vessels which may affect functioning of the heart
v) Liver damage resulting infatty liver which leads to cirrhosis and formation of fibrous tissues
vi) Body loses its control and consciousness eventually leading to health complications and ultimately to death.

28.   How does rain water harvesting structures recharge ground water?

Rainwater harvesting is a technique of **collecting and storing rainwater** for future use. It is a traditional method of storing rain water in underground tanks, ponds, lakes, check dams and used in future. The main purpose of rainwater harvesting is to make the rainwater percolate under the ground so as to recharge **'groundwaterlevel'**.

29.   Methods of rain water harvesting:

  a) **Roof top rain water harvesting:** Roof-tops are excellent **rain**

  catchers.The rain water that falls on the roof of the houses, apartments, commercial

  buildings etc.iscollected and stored in the surface tank and can be used for domestic

  purpose.

  b) **Recharge pit:** In this method, the rainwater is first collected from the roof tops or open spaces and isdirected into the **percolation pits** through pipes for filtration. After filtration the rainwater enters the **recharge pits** or **ground wells**.

30.Enumerate the importance of forest.

Importance of forest.

✦ Forests are an important component of our environment.

✦ Forests consist of economically and medicinally valuable microorganisms, flowering plants, shrubs,climbers and densetrees.

✦ Forests provide a vast habitat for wild animals.

✦ Forests also contribute to the economic development of our country.

✦ Forests are important source for a wide range of renewable natural resource.

✦ They provide wood,food,fodder,fibre and medicine.

✦ Forests act as carbon sink, regulate climatic conditions, increase rainfall, reduce global warming, prevent natural hazards like flood and landslides, protect wildlife and also act as catchments for water conservation.

✦ They also play a vital role in maintaining the ecological balance.

Problems

1. Calculate the velocity of a movingbody of mass 5 kg whose linear momentum is2.5 kg m s–1

   Solution: Linear momentum = mass × velocity

   Velocity = linear momentum / mass.

   V = 2.5 / 5 = 0.5 ms^{-1}

2. A beam of light passing through a diverginglens of focal length 0.3m appear to be focused at a distance 0.2m behind the lens. Find theposition of the object.

   Solution:

   f = −0.3 m, v = −0.2 m

   $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$

   $\frac{1}{u} = \frac{1}{v} - \frac{1}{f}$

   $\frac{1}{u} = \frac{1}{-0.2} - \frac{1}{-0.3} = \frac{-10}{6}$

   $\frac{1}{u} = \frac{10}{-6}$

   u = −0.6 m

3. A person with myopia can see objects placed at a distance of 4m. If he wants to see objects at a distance of 20m, what should be the focal length and power of the concave lens he must wear?

   Solution:

   Given that x = 4m and y = 20m.

   Focal length of the correction lens is

   $f = \frac{xy}{x-y}$

   $f = \frac{4 \times 20}{4 - 20}$

   $F = \frac{80}{-16} = -5$ m

   Power of the correction lens

   $P = \frac{1}{f}$

   $= -\frac{1}{5} = -0.2$ D

4. For a person with hypermeteropia, thenear point has moved to 1.5m. Calculate thefocal length of the correction lens in order tomake his eyes normal.

   Solution:

   Given that, d = 1.5m; D = 25cm = 0.25m (Fora normal eye).

   From equation (2.8), the focal length of the

   correction lens is

   $f = \frac{d \times D}{d - D} = \frac{1.5 \times 0.25}{1.5 - 0.25} = \frac{0.375}{1.25} = 0.3$ m

5. A charge of 12 coulomb flows through a bulb in 5 second. What is the current through the bulb?

   Solution:

   Charge Q = 12 C, Time t = 5 s. Therefore,

   current $I = \frac{Q}{t} = \frac{12}{5} = 2.4$ A

6. The work done in moving a charge of 10 C across two points in a circuit is 100 J. What is the potential difference between the points?

   Solution:

   Charge, Q = 10 C Work Done, W = 100 J

   Potential Difference $V = \frac{W}{Q} = \frac{100}{10}$.

   Therefore, V = 10 volt

7.   Calculate the resistance of a conductor through which a current of 2 A passes, when the potential difference between its ends is 30 V.

Solution:
Current through the conductor I = 2 A,
Potential Difference V = 30 V
From Ohm's Law: $R = \dfrac{V}{I} = \dfrac{30}{2}$
         R = 15 Ω

8.   Three resistors of resistances 5 ohm, 3 ohm and 2 ohm are connected in series with 10 V battery. Calculate their effective resistance and the current flowing through the circuit.

Solution:
R1 = 5 Ω, R2 = 3 Ω, R3 = 2 Ω, V = 10 V
Rs = R1 + R2 + R3, Rs = 5 + 3 + 2 = 10, hence
Rs = 10 Ω
    The current, $I = \dfrac{V}{R} = \dfrac{10}{10} = 1$ A
          I = 1 A

9.   An electric heater of resistance 5 Ω is connected to an electric source. If a current of 6 A flows through the heater, then find the amount of heat produced in 5 minutes.

Solution:
Given resistance R = 5 Ω, Current I = 6 A,
Time t = 5 minutes = 5 × 60 s = 300 s
Amount of heat produced, H = I^2 Rt,
      H = 6^2 × 5 × 300. Hence, H = 54000 J

10.   Calculate the current and the resistance of a 100 W, 200 V electric bulb in an electric circuit.

Solution:
Power P = 100 W and Voltage V = 200 V
Power P = V I
So, Current, $I = \dfrac{P}{V} = \dfrac{100}{200} = 0.5$ A
Resistance, $R = \dfrac{V}{I} = \dfrac{200}{0.5} = 400$ Ω

11.   Calculate the amount of energy released when a radioactive substance undergoes fusion and results in a mass defect of 2 kg.

Solution:
Mass defect in the reaction (m) = 2 kg
Velocity of light (c) = 3 × 108 m s-1
By Einstein's equation,
Energy released E = mc^2
So
E = 2 × $(3 × 10^8)^2$
= 1.8 × 10^{17} J

12.   Calculate the gram molecular mass of the water molecule
Gram molecular mass of H2O
= (1 × 2) + (16 × 1)
= 2 + 16
    Gram molecular mass of H2O = 18 g

13.   Calculate the % of oxygen in Al₂(SO₄)₃. (Atomic mass: Al-12, O-16, S-32)
$Al_2(SO_4)_3$.

Molar Mass of Al₂(SO₄)₃	= 2 (Al) + 3 (S) + 12 (O)
	= 2 (27) + 3 (32) + 12 (16)
	= 54 + 96 + 192
	= 342 g.

% of Oxygen in $Al_2(SO_4)_3$
      % of Oxygen = $\dfrac{\text{Mass of Oxygen}}{\text{Molecular Mass of } Al_2(SO_4)_3}$ X 100 = $\dfrac{192}{324}$ X 100

           = 59.25 %

14. A solution was prepared by dissolving 25 g of sugar in 100 g of water. Calculate the mass percentage of solute.

Mass of the solute = 25 g

Mass of the solvent = 100 g

Mass Percentage = $\dfrac{\text{Mass of the solute}}{\text{Mass of the solute + Mass of the solvent}}$ × 100 = $\dfrac{25}{25+100}$ = $\dfrac{25}{125}$ = 20%

15. . A solution is prepared by dissolving 45 g of NaCl in 100 g of water. Calculate the mass percentage of solute.

Mass of the solute = 45 g

Mass of the solvent = 100 g

Mass Percentage = $\dfrac{\text{Mass of the solute}}{\text{Mass of the solute +Mass of the solvent}}$ × 100 = $\dfrac{4500}{45+100}$ = $\dfrac{4500}{145}$ = 29.80%

16. Calculate the pH of 0.01 M HNO_3?

Solution:

[H+] = 0.01

$p^H = -\log_{10} [H^+]$

$p^H = -\log_{10} [0.01]$

$p^H = -\log_{10} [1 \times 10^{-2}]$

$p^H = -(-2)$

$p^H = 2$

17. Calculate the p^H of 0.001 molar solution of HCl.

$0.001 = 1 \times 10^{-3}$

$p^H = -\log_{10} [H^+]$

$p^H = -\log10[H^+] = -\log_{10} [1 \times 10^{-3}]$

  $= -(-3) = 3$

 $p^H = 3$

18. The hydroxide ion concentration of a solution is 1×10^{-11}M. What is the pH of the solution?

$[OH^-] = 1 \times 10^{-11}$ mol litre^{-1}

$p^{OH} = -\log_{10}[OH^-]$

    $= -\log_{10} \times [1 \times 10^{-11}]$

    $= -(-11)$

$p^{OH} = 11$

 $p^H + p^{OH} = 14$

$p^H = 14 - p^{OH}$

   $= 14 - 11$

$P^H = 3$
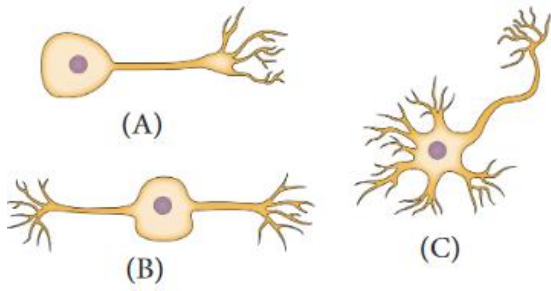
2. Unipolar (A), Bipolar (B) and multipolar (C) neurons
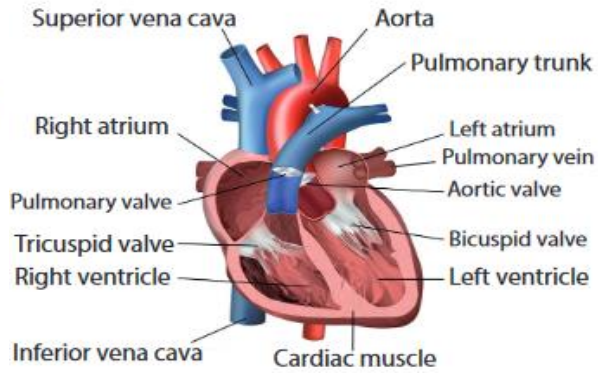
Internal structure of human heart
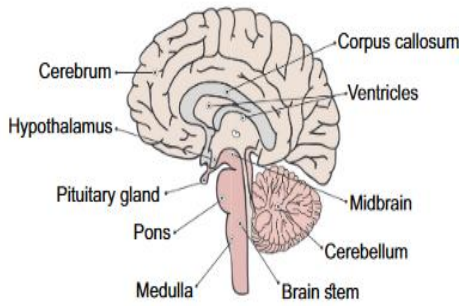
Fig. 15.5 L.S of Human Brain
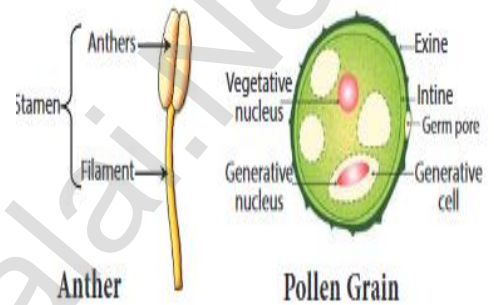
Figure 17.8 Structure of Anther and Pollen grain
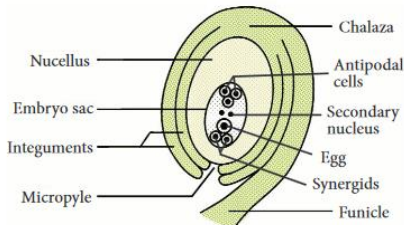
Figure 17.10 Structure of an Ovule
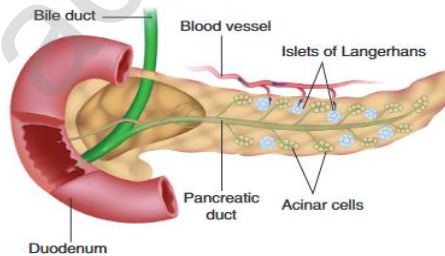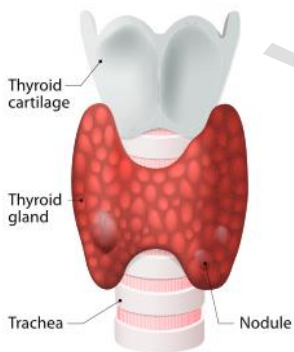
Figure 16.10 Pancreas

Figure 16.8 Thyroid Gland

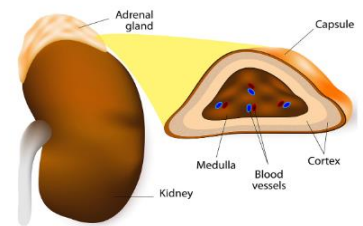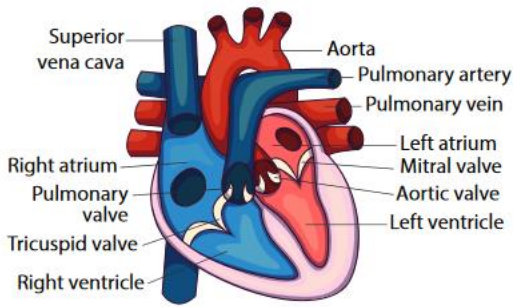Figure 12.8 Ultrastructure of Chloroplast

Figure 16.11 Adrenal Gland
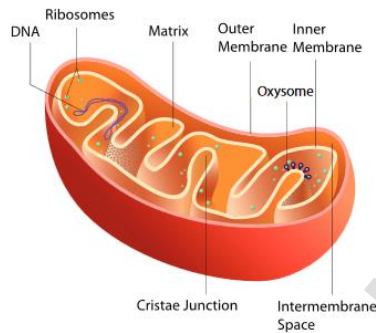
Figure 14.11 External structure of human heart
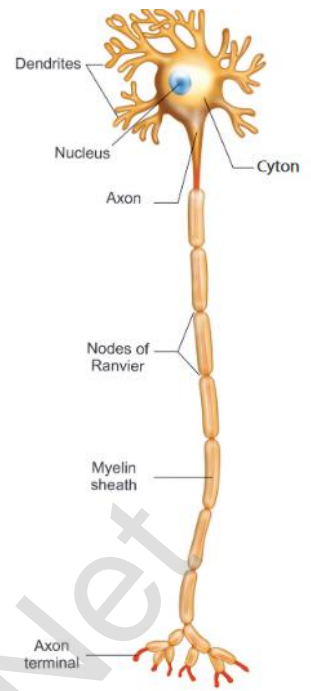

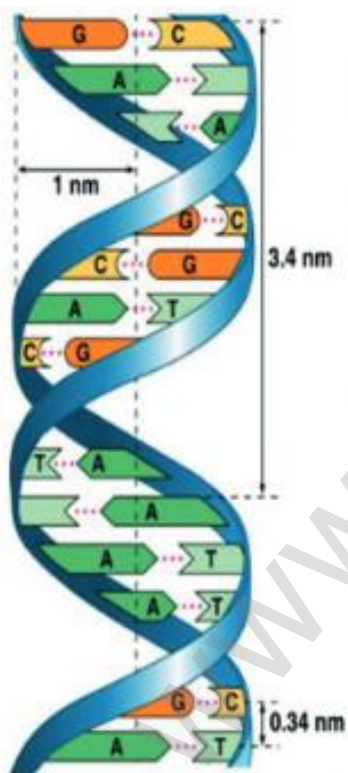Figure 12.10 Structure of Mitochondria

Fig. 15.1 Structure of Neuron

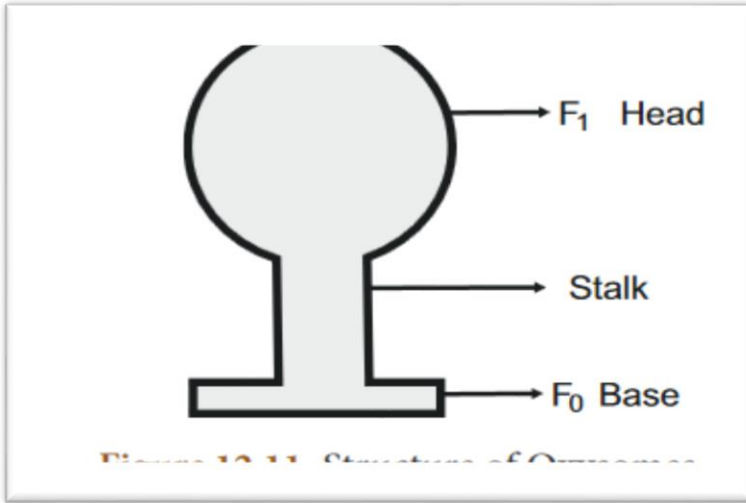Figure 18.6 Structure of DNA
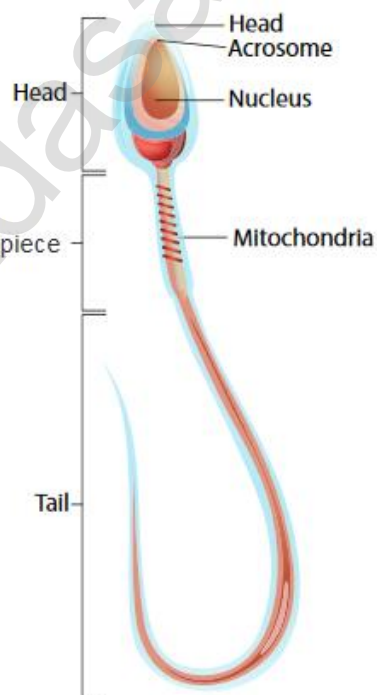
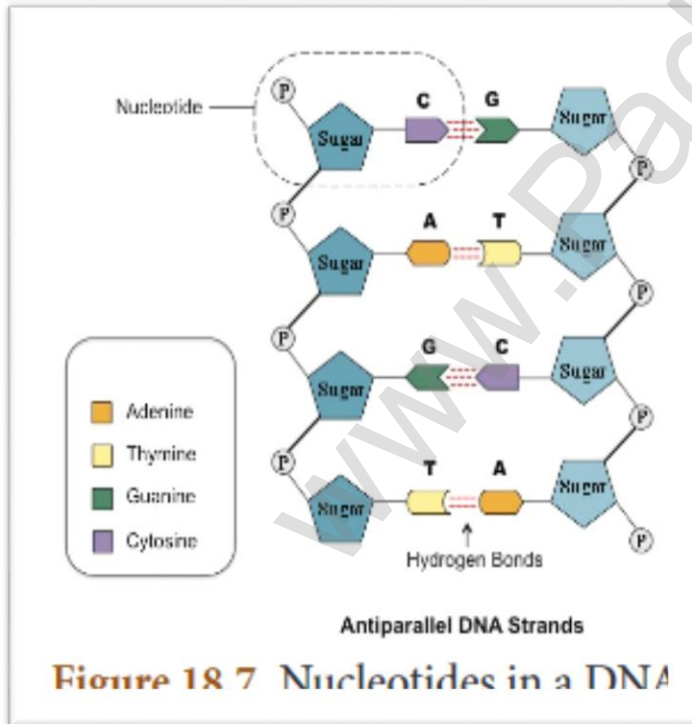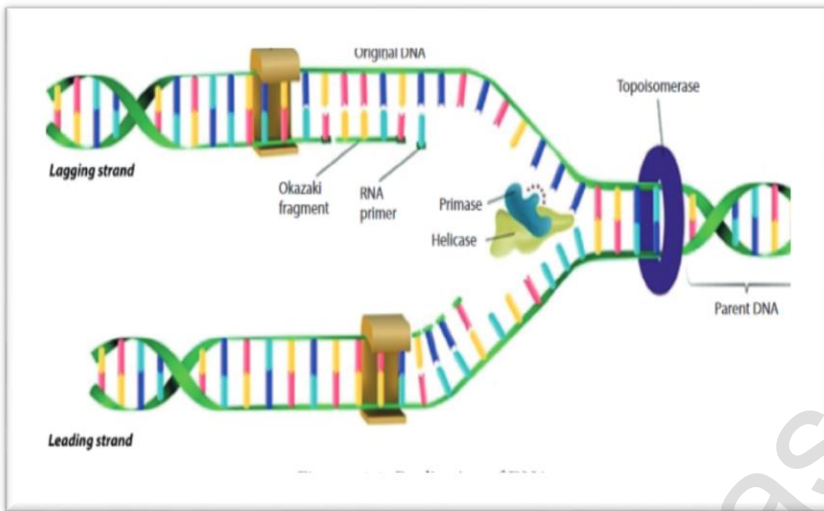Figure 17.15 Structure of sperm

Figure 12.11 Structure of Oxysomes

Antiparallel DNA Strands

Figure 18.7 Nucleotides in a DNA

Q