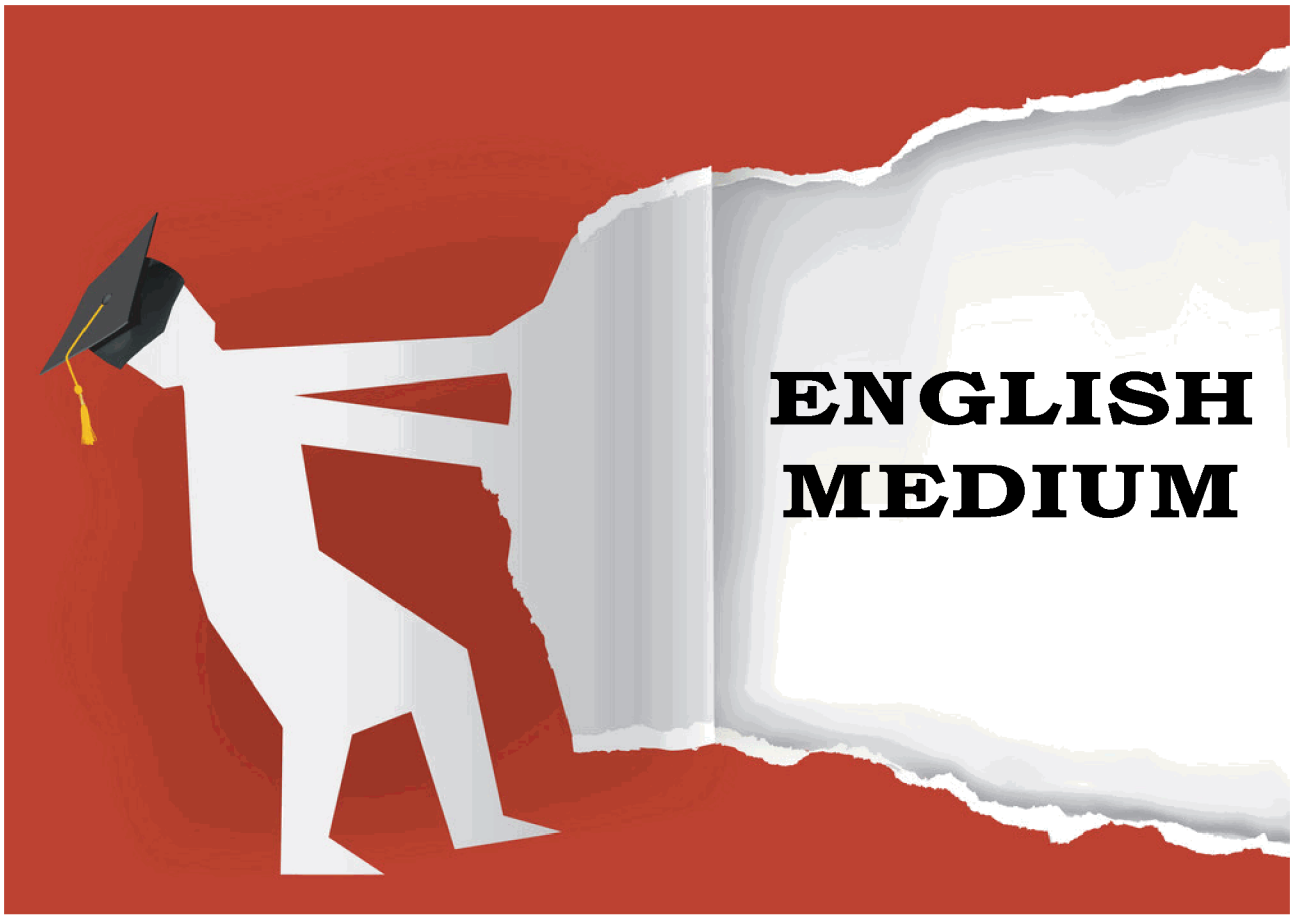

ENGLISH
MEDIUM

Unit 1

SENSATIONS AND RESPONSES

Score : 35
Time : 70 mts

Questions from 1 to 5 carry 1 score each.

1. Identify the word pair relation and fill in the blanks.

   a) Motor Nerve : Carries impulses from brain and spinal cord to various parts of the body.

   Mixed Nerve : _____

   b) Brain : Central nervous system

   Cranial nerves : _____

2. Identify the odd one and write the common feature of others.

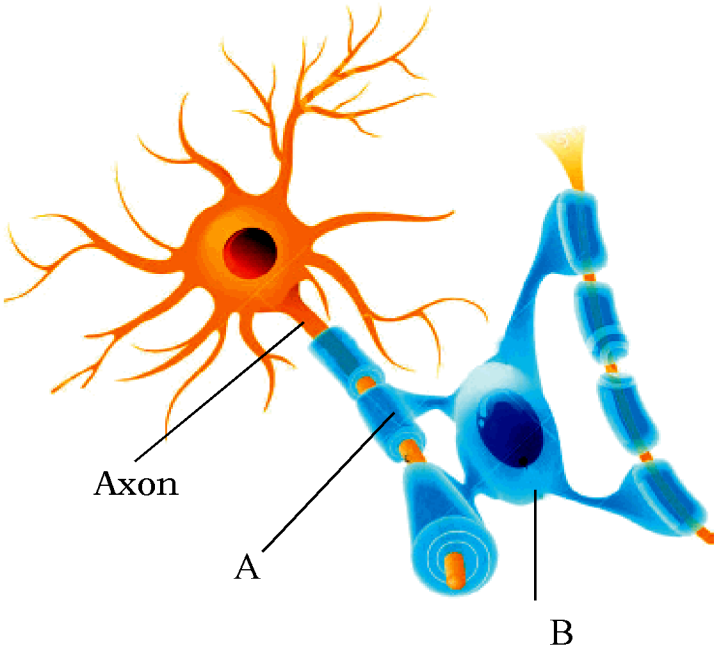
   Thought, intelligence, breathing, memory

Complete the following statements.

3. The senses that evoke responses in organism are called_____.
4. The pathway of impulses in the reflex action is known as_____.
5. The part where myelinated nerve cells are present in abundance is called_____.

Questions from 6 to 10 carry 2 score each.

6. Observe the illustration and answer the following questions.



a) Identify A and B.

b) Write the function of the part labelled as A.

7. Arrange the following statements in the table given below.

i) Production of hormone increases.

ii) Urinary bladder contracts.

iii) Glucose is converted to glycogen.

iv) Production of saliva decreases.

Sympathetic system	Parasympathetic system
• •	• •

8. The peculiarities of a fluid in the brain is given below.

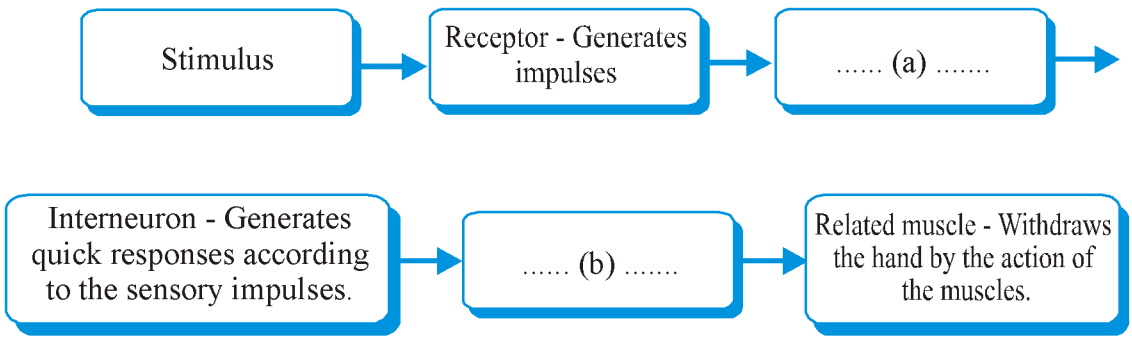
* Filled within the inner membranes of meninges and the ventricles of the brain.

* Formed from the blood and is reabsorbed into the blood.

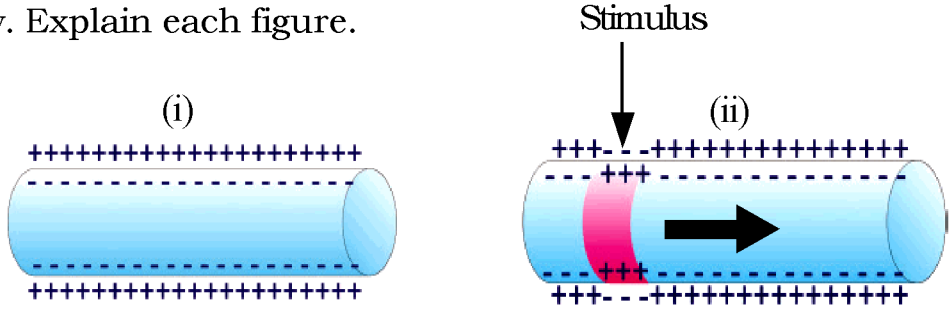
a. Identify the fluid.

b. What are the functions of this fluid?

9. Complete the flowchart related to reflex action.



10. The figures related to generation and transmission of impulses are given below. Explain each figure.



Questions from 11 to 14 carry 3 score each.

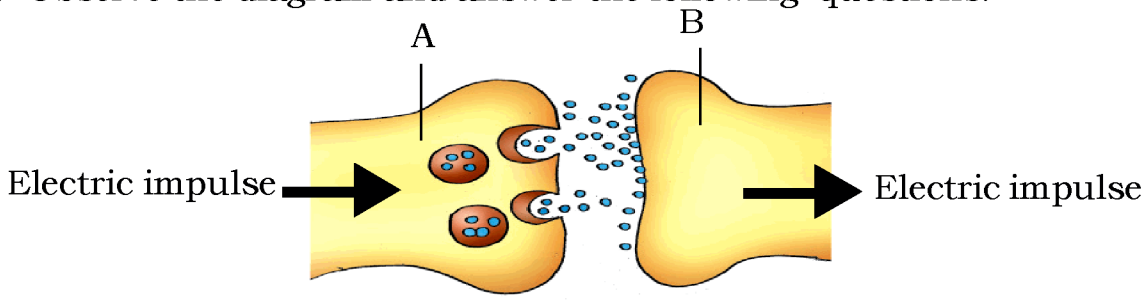
11. Analyse the given statement and answer the following questions.

" Myelin sheath has a shiny white colour".

a) How myelin sheath is formed?

b) Differentiate the formation of myelin sheath in nerves and brain.

12. Observe the diagram and answer the following questions.



a) Identify A and B.

b) Why the impulses are transmitted only from A to B ?

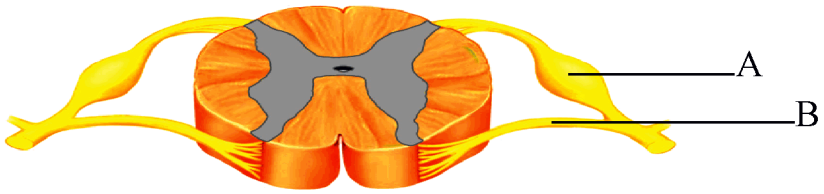
c) Name two neurotransmitters.

13. The following are the symptoms of some diseases affecting the nervous system. Examine them and complete the table.

- Continuous and irregular flow of electric charges in the brain.
- Loss of body balance.
- Destruction of ganglions in the brain.
- Loss of memory.
- Frothy discharge from the mouth.
- Accumulation of an insoluble protein in the neural tissues of the brain.

A_____	**Alzheimer's**	**B**_____
Loss of body balance • _____	• _____ • _____	Continuous and irregular flow of electric charges in the brain. • _____

14. Observe the figure and answer the questions given below.

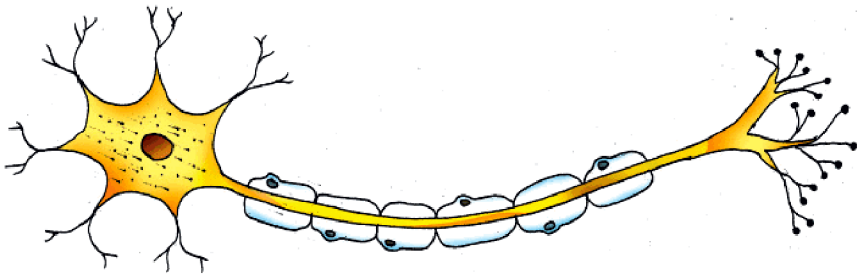


a) Identify the figure and write its function.

b) Identify the parts indicated as A, B.

Questions 15 and 14 carry 4 score each.

15. Redraw the diagram of neuron and label the parts based on the indicators.

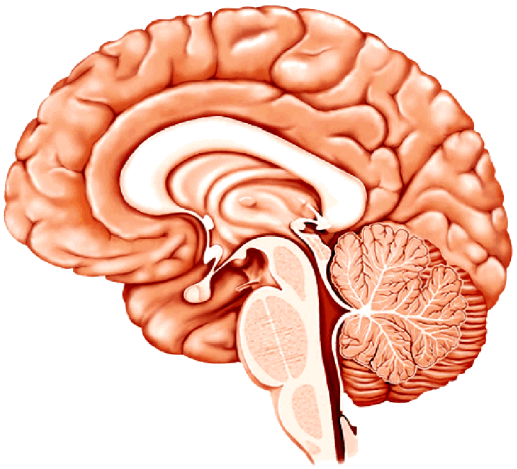


a) Carries impulses from dendrites to the cell body.

b) Carries impulses to the synaptic knob.

c) Carries impulses from the cell body to outside.

16. Redraw the figure, identify and label the parts performing the following functions.



a) The part that maintains equilibrium of the body.

b) Controls voluntary actions.

c) Plays a major role in the maintenance of homeostasis.

Unit 1

SENSATIONS AND RESPONSES

Answer key

Qn. No.	Scoring Indicator	Score
1.	a) Carries impulses to and from the brain and spinal cord b) Peripheral nervous system	½ + ½
2.	Breathing. All others are functions controlled by cerebrum	½ + ½
3.	Stimulus	1
4.	Reflex arc	1
5.	White matter	1
6.	a) A - Myelin sheath B - Oligodendrocyte b) To provide nutrients and oxygen to the axon, accelerate impulses, act as an electric insulator, protect the axon from external shocks (any two)	½ + ½ ½ + ½
7.	**Sympathetic** / **Parasympathetic** i) Production of hormone increases. / ii) Urinary bladder contracts. iv) Production of saliva decreases. / iii) Glucose is converted to glycogen.	½ + ½ ½ + ½
8.	a Cerebrospinal fluid b. - To provide nutrients and oxygen to the tissues of the brain. - Regulate the pressure inside the brain. - Protect the brain from injuries.	½ 1½
9.	a. Sensory neuron- carries impulses to the spinal cord. b. Motor neuron - carries the information from spinal cord to related muscles.	½ + ½ ½ + ½
10.	(i) - The outer surface of the plasma membrane of the neuron is positively charged and the inner surface is negatively charged. This is due to the difference in the distribution of certain ions.	1

	(ii) -When stimulated, the distribution of ions in that particular part changes and hence the inner surface becomes positively charged and the outer surface becomes negatively charged.	1
11.	a) Axons of most of the neurons are repeatedly encircled by myelin ,a membrane containing lipid. This is called myelin sheath. b) Myelin sheath in the nerves is formed of schwann cells and myelin sheath in the brain is formed of specialized cells called oligodendrocytes.	1 1 1
12.	a. A - Synaptic knob B - Dendrite b. When electric impulses from the axon reach the synaptic knob, neurotransmitters are secreted to the synaptic cleft. They stimulate the adjacent dendrite and new electric impulses are generated. c. Acetylcholine , Dopamine	½+½ 1 ½+½
13.	A - Parkinsons - Destruction of ganglions in the brain Alzheimer's - Loss of memory - Accumulation of an insoluble protein in the neural tissues of the brain. B - Epilepsy - Frothy discharge from the mouth.	½ ½ ½ ½ ½
14.	a. Spinal cord - Impulses from different parts of the body are transmitted to and from the brain through the spinal cord. - It also coordinates the repeated movements during walking, running etc. b. A - Dorsal root B - Ventral root	1 ½+½ ½+½
15.	Drawing a Dendron, Identify and labelling b. Axonite, Identify and labelling c. Axon, Identify and labelling	1 1 1 1
16.	Diagram a. Cerebellum, Identify and labelling b. Cerebrum, Identify and labelling c. Hypothalamus, Identify and labelling	1 1 1 1

Unit 2

WINDOWS OF KNOWLEDGE

Score : 35
Time : 70 mts

Questions from 1 to 6 carry 1 score each.

1 The projected transparent anterior part of the sclera.

A) Iris B) Cornea

C) Lens D) Yellow spot

Find the word pair relationship and fill the blanks.

2. Point of maximum visual clarity. : Yellow spot

The part in retina where there is no vision : .....

3. The reason for different types of cone cells in the eye.

(A) The difference in amino acids in the opsin.

(B) The difference in amino acids in the retinal.

(C) The difference in amino acids in the rhodopsin.

(D) None of these

4. The ability to see the three dimensional image of object is due to

(A) Power of accommodation (B) Refraction

(C) Binocular vision (D) Colour vision

5. Name the enzyme present in tears.

(A) Trypsin (B) Lysozyme

(C) Pepsin (D) Salivary amylase

6. Which part of the ear helps in maintaining body balance?

(A) Cochlea (B) Semicircular canals

(C) Tympanum (D) Oval window

Questions from 7 to 12 carry 2 score each.

7 . Observe the picture and answer the following questions.

a) Identify the photoreceptors indicated as A and B.

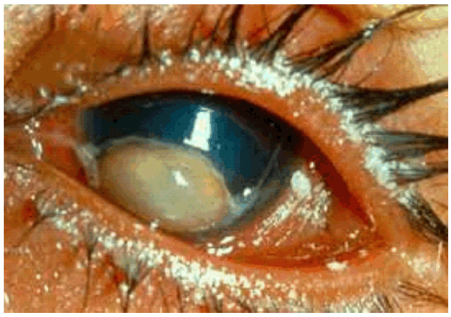
b) Name the pigments present in A and B.

8. Analyse the following statements and arrange them suitably in the table.

- Ciliary muscles contract.
- Focal length increases.
- Curvature of lens increases.
- Ligaments stretch.

While viewing nearby objects	**While viewing distant objects**

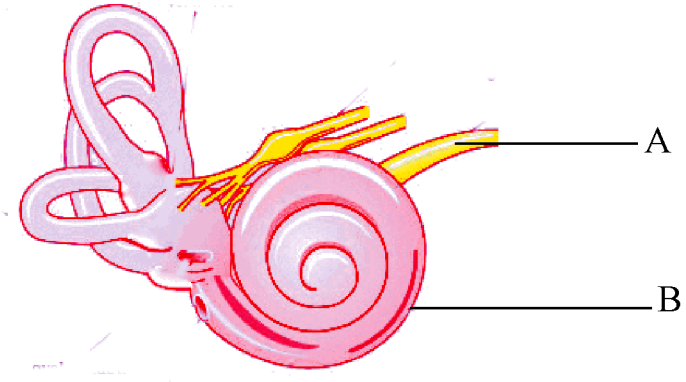
9. Observe the picture and answer the following questions.



a) Identify the eye disorder.

b) Write the cause of this disease.

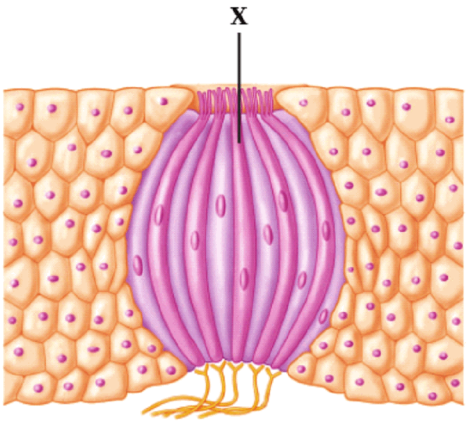
10. Observe the figure and answer the following questions.



a) Identify the parts indicated as A and B.

b) Which are the parts of inner ear that help in body balancing?

11. Observe the picture and answer the following questions.



a) Identify the part labelled as X.

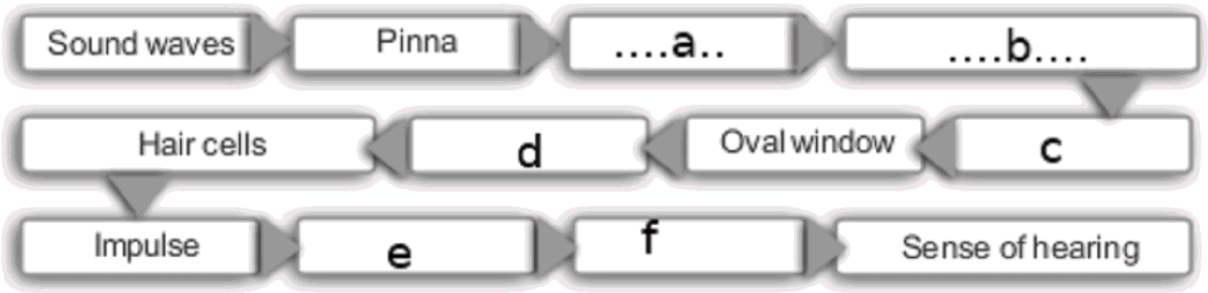
b) Name the receptors present in this which help to detect the taste.

12. The given table shows eye disorders and symptoms. Arrange them suitably.

Eye disorders	Symptoms
(a) Colour blindness	(i) Lens of the eyes become opaque.
(b) Cataract	(ii) Cannot distinguish green and red colours.
(c) Conjunctivitis	(iii) An increase in the pressure inside the eyes.
(d) Glaucoma	(iv) This is an infection of the conjunctiva.

Questions from 13 to 15 carry 3 score each.

13. Complete the following flowchart related with hearing.



14. Analyse the given stages related to the experience of smell. Arrange them properly.

a. These aromatic particles dissolve in the mucus inside the nostrils.

b. Impulses are formed

c. Aromatic particles diffuse in the air and enter the nostrils

d. Impulses reach the cerebrum through the olfactory nerve.

e. Stimulate the olfactory receptors.

f. Experiences smell.

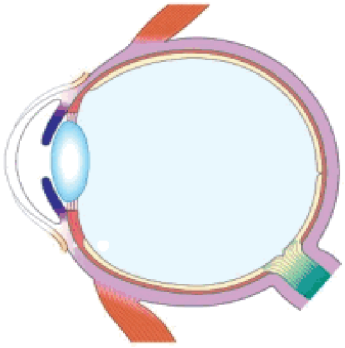
15. Make suitable pairs from the words given in the box.

Sample: Planaria - Eyespot

Snake , Eyespot, Shark , Jacobson's Organ, Planaria, Lateral line, Ommatidia, Housefly

Questions 16 and 17 carry 4 score each.

16. Redraw the figure. Identify the parts according to the hints and label them

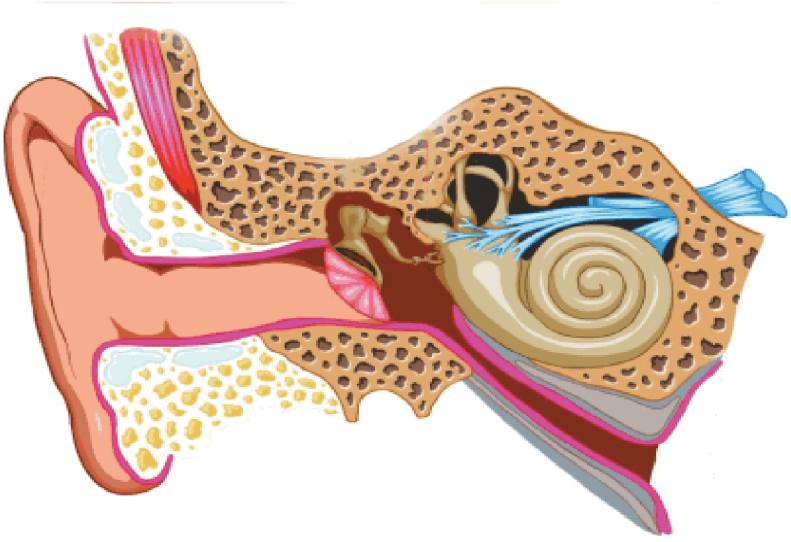


a. The part where the muscles that regulate the size of the pupil are seen.

b. Jelly like fluid.

c. The layer of eye where photoreceptors are seen.

17. Observe the structure of ear and answer the following questions.



a) Part that carries sound waves to the tympanum.

b) Balancing the pressure on either side of the tympanum.

c) The nerve which helps in the balancing of body.

d) Name snail shell like part of the inner ear.

Unit 2

WINDOWS OF KNOWLEDGE

ANSWER KEY

Qn.No.	Scoring indicators	Score
1.	B) Cornea	1
2.	Blind spot	1
3.	(A) The difference in amino acids in the opsin.	1
4.	(C) Binocular vision.	1
5.	(B) Lysozyme	1
6.	(B) Semicircular canals	1
7.	a) A-Rod cell B-Cone cell b)A- Rhodopsin B- Photopsin/Iodopsin	½+½ ½+½
8.	While viewing nearby objects - Ciliary muscles contract, Curvature of lens increases. While viewing distant objects - Focal length increases, Ligaments stretch.	 ½+½ ½+½
9.	a) Xerophthalmia b) Prolonged deficiency of Vitamin A, the conjunctiva and cornea become dry and opaque.	1 1
10.	a) A- Auditory nerve B - Cochlea b) Semicircular canal, vestibular nerve, vestibule	1 1
11.	a) Taste bud b) Chemoreceptors	1 1
12.	(a) Colour blindness-(ii) Cannot distinguish green and red colours. (b) Cataract -(i) Lens of the eyes become opaque. (c) Conjunctivitis -(iv)This is an infection of the conjunctiva. (d) Glaucoma - (iii) An increase in the pressure inside the eyes.	 ½ ½ ½ ½
13.	a. Auditory canal b. Tympanum c. Ear ossicles d. Cochlea e. Auditory nerve f. Cerebrum	½+½+½ ½+½+½
14	c. Aromatic particles diffuse in the air and enter the nostrils. a. These aromatic particles dissolve in the mucus inside the nostrils. e. Stimulate the olfactory receptors.	½ ½ ½

	b. Impulses are formed. d. Impulses reach the cerebrum through the olfactory nerve. f. Experiences smell.	½ ½ ½
15.	Snake - Jacobson's Organ Shark - Lateral line Housefly - Ommatidia	1 1 1
16	Drawing a) Iris, Identify and labelling b) Vitreous humour, Identify and labelling c) Retina, Identify and labelling	1 1 1 1
17,	a) Ear canal b) Eustachian tube c) Vestibular nerve d) Cochlea	1 1 1 1

Unit 3

CHEMICAL MESSAGES FOR HOMEOSTASIS

Score : 35
Time : 70 mts

Questions from 1 to 6 carry 1 score each.

1. Identify the word pair relation and fill in the blanks.

   a) Female silk worm moth : Bombykol

   Musk deer : _____

   b) Sperm production : Testosterone

   Implantation of embryo in the uterus. : _____

2. Name the artificial plant hormone, used in rubber trees to increase the production of latex.

3. Select the correct answer.

   The hormone known as 'Youth hormone.'

   (a) Melatonin (b) Thymosin (c) Calcitonin (d) Estrogen

4. Find the odd one and write the common feature of others.

   TSH, ACTH, ADH, GTH

5. Correct the mistakes if any in the underlined part of the given statements.

   a) Aldosterone controls inflammation and allergy.

   b) Pineal gland produces melatonin that helps to maintain the rhythm of our daily activities.

6. Which hormone pair among the following is related to emergency situations.

   a) Cortisol - Aldosterone

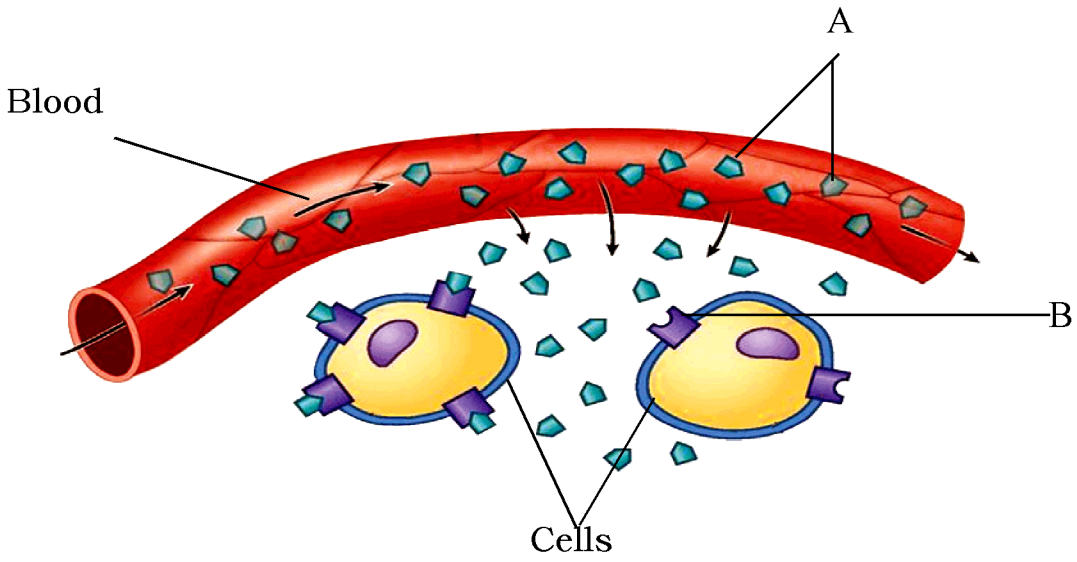
   b) Vasopressin - Aldosterone

   c) Epinephrine - Norepinephrine

   d) Epinephrine - Cortisol

Questions from 7 to 12 carry 2 score each.

7. Analyse the illustration and answer the following questions.



a) Identify A and B.

b) Write the influence of hormone in the target cells.

8. Complete the table suitably.

Hormone	**Function**
.....A.....	Synthesizes glucose from amino acids.
Vasopresin	.....B.....
.....C.....	Production of milk.
Adreno Cortico Tropic Hormone (ACTH)	.....D.....

9. Complete as in the sample.

Sample : Dwarfism - Production of somatotropin decreases during the growth phase - Retarded growth

a) Gigantism - ..... - .....

b) Acromegaly - ..... - .....

10. Make suitable pairs by using the words given in the box.

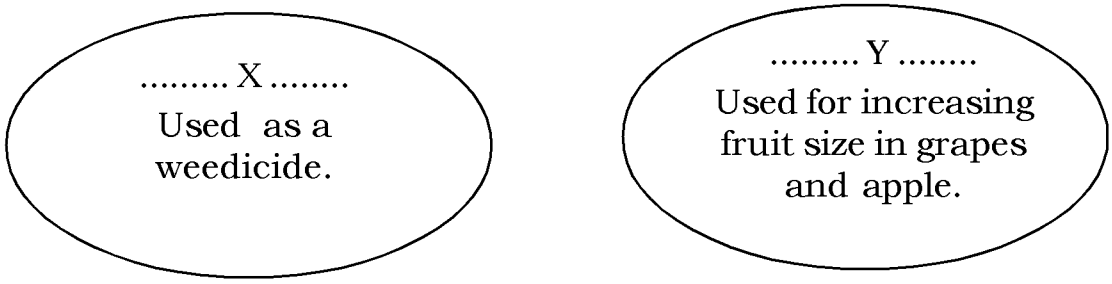
Ethylene, Dormancy of embryo, Ripening of leaves and fruits, Fruit formation, Cytokinin, Auxin, Cell differentiation, Sprouting of leaves, Abscisic acid.

11. Ants move in a line along a particular trail.

a) Name the chemical substances that help for this movement.

b) Write the other functions of these chemical substances.

12. X, Y indicate two artificial plant hormones. Observe the illustration and answer the questions.

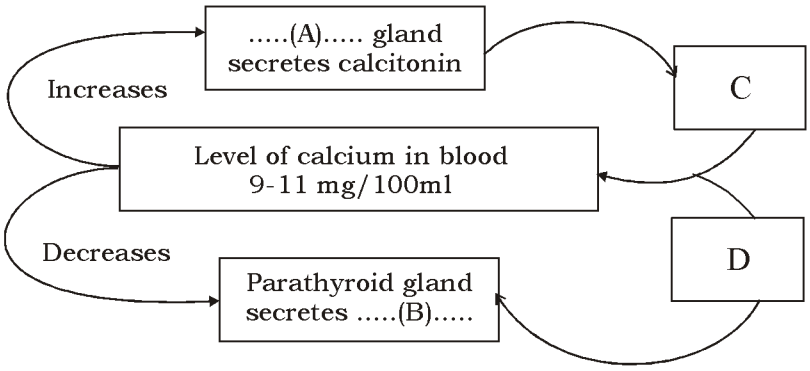


a) Identify X and Y.

b) Write any one function each of artificial hormones abscisic acid and ethylene used in the agricultural sector.

Questions from 13 to 15 carry 3 score each.

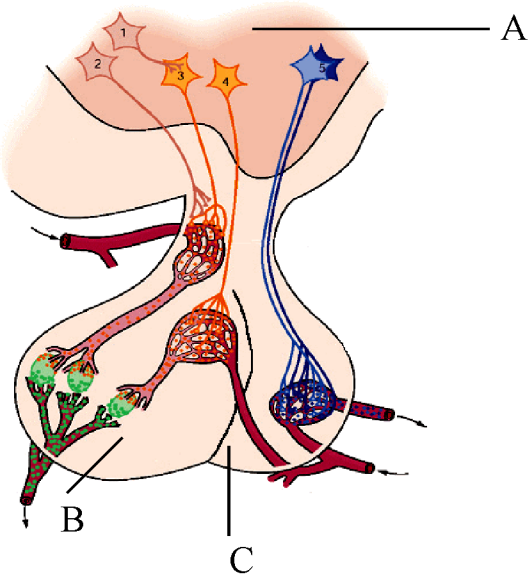
13. Analyse the illustration showing the action of hormones that maintains the level of calcium in blood and answer the following questions.



a) Identify A and B.

b) Explain C and D that denote the actions of hormones which regulate the calcium level.

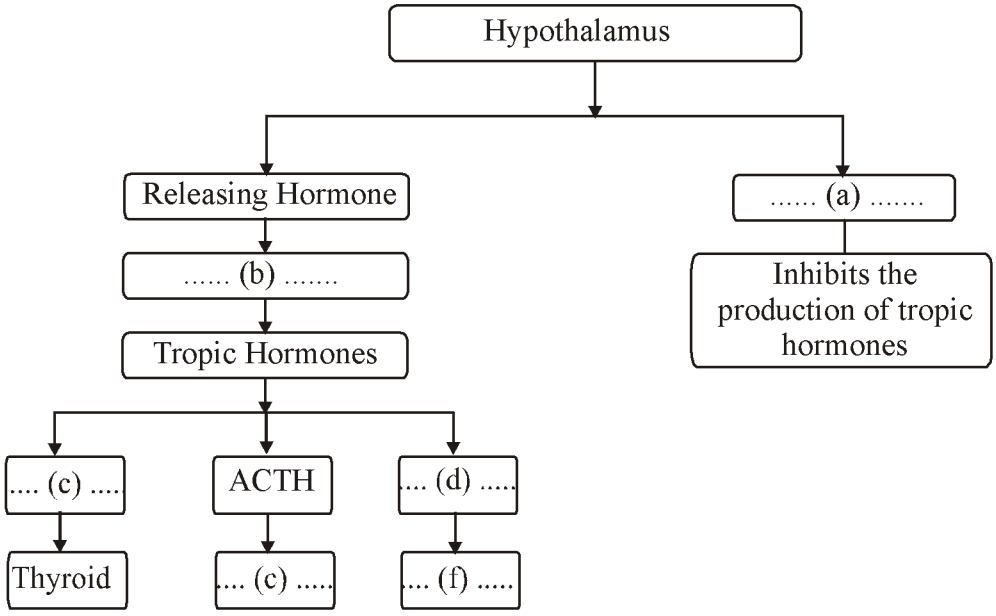
14. Observe the figure and answer the questions given below.



a) Identify the parts indicated as A, B.

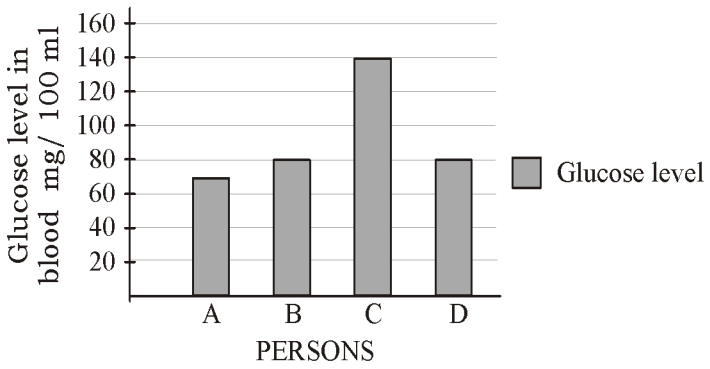
b) Name the hormones secreted from the part indicated as C. Write its functions also.

15. Complete the illustration.



Questions 16 and 17 carry 4 score each.

16. Observe the graph that shows the level of glucose in the blood of different persons before breakfast. Analyse the graph and answer the questions.

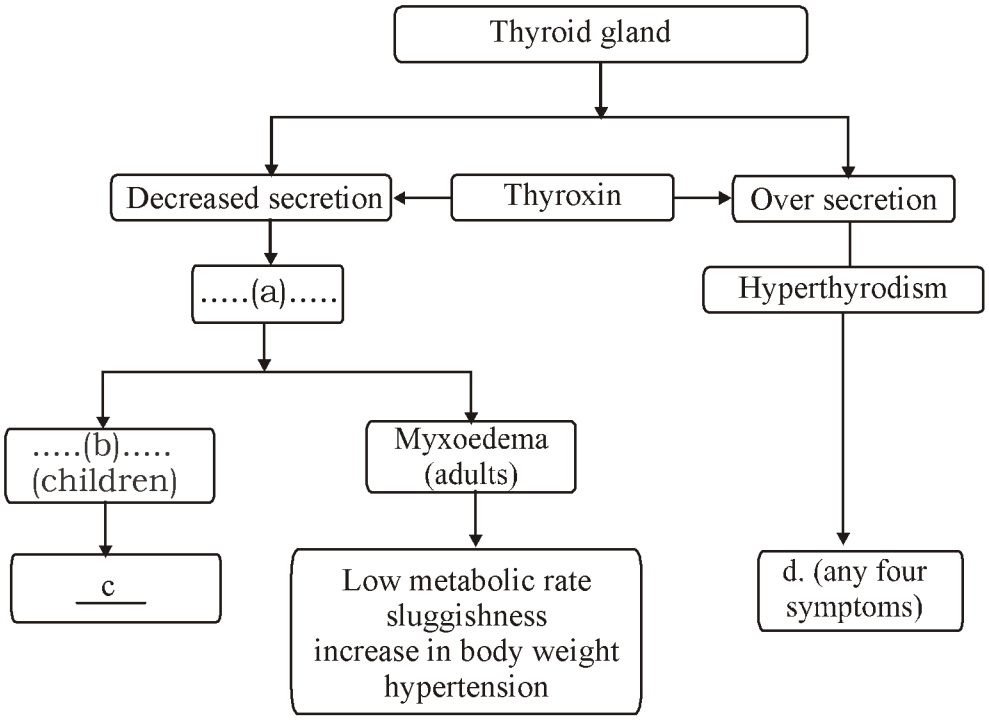


a) Write the normal level of glucose in blood. From the graph identify which person is diabetic.

b) What are the causes of diabetes?

c) Write the symptoms of diabetes.

17. Complete the illustration related to the disorders of thyroid gland.



Unit 3

CHEMICAL MESSAGES FOR HOMEOSTASIS

ANSWER KEY

Qn. No.	Scoring Indicator	Score
1.	a) Muscone b) Progesterone	½ ½
2.	Ethyphon	1
3.	b) Thymosin	1
4.	ADH, all others are tropic hormones	½+×½
5.	a) Cortisol controls inflammation and allergy	1
6.	c) Epinephrine - Norepinephrine	1
7.	a) A - Hormone B - Receptor b) Each hormone molecule binds with the receptor to form a hormone - receptor complex. Following this enzymes are activated within the cell and certain changes occur in cellular activities.	½ + ½ ½ + ½
8.	A - Glucagon B - Helps in the reabsorption of water in the kidney. C - Prolactin D - Stimulates the activity of adrenal cortex	½ ½ ½ ½
9.	a. Gigantism - Production of somatotropin increases during the growth phase - excessive growth of the body b. Acromegaly - Excessive production of somatotropin after the growth phase - growth of the bones on the face, jaws and fingers.	½+½ ½+½
10.	Ethylene - Ripening of leaves and fruits Auxin - Fruit formation Cytokinin - Cell differentiation Abscisic acid - Dormancy of embryo	½ ½ ½ ½
11.	a. Pheromones b. Help in attracting mates, informing the availability of food, determining the path of travel, signalling dangers (any two).	1 ½+½

12.	a. X - Auxin Y - Gibberellin b. Ethylene - For the flowering of pineapple plants at a time. For the ripening of tomato, lemon orange etc. (any one) Abscisic acid - used for harvesting fruits at the same time.	½+½ ½ ½
13.	a) A - Thyroid B - Parathormone b) C - Prevents the process of mixing of calcium from bones to blood. Stores the excess calcium from blood to bones. D - Reabsorbs calcium from kidneys to blood. Prevents the storage of calcium in bones.	½ ½ ½+½ ½+½
14.	a) A - Hypothalamus B - Anterior lobe of pituitary gland b) Oxytocin, Vasopressin (ADH) Oxytocin - Facilitates child birth by stimulating the contraction of smooth muscles in the uterine wall, facilitates lactation (any one) Vasopressin - Helps in the reabsorption of water in the kidney.	½ ½ ½+½ ½ ½
15.	a) Inhibitory hormone b) Stimulates the anterior lobe of pituitary gland and secretes tropic hormones c) TSH d) GTH e) Adrenal cortex f) Gonads	½ ½ ½ ½ ½
16.	a) 70-110 mg/100 ml blood, person C. b) Decreased production of insulin due to the destruction of beta cells. The inability of cells to utilize the insulin produced. c) Increased appetite, thirst and frequent urination.	1+1 ½+½ 1
17.	a) Hypothyroidism b) Cretinism c) Hinders proper physical and mental development. d) Excessive sweating, rise in body temperature, high metabolic rate ,increased heart beat, weight loss, emotional imbalance (any four)	½ ½ ½ ½+½+½½+½

Unit 4
KEEPING DISEASES AWAY

Score : 35
Time : 70 mts

Questions from 1 to 6 carry 1 score each.

1 Find out the word pair relationship and complete the following.

Foot and mouth disease : Virus

Inflammation of udder : .....

2. Identify the odd one. Mention the common feature of others.

(A) Malaria (B) Filariasis

(C) AIDS (D) Dengue fever

3. Which one of the following is not a bacterial disease.

(A) Rat fever (B) Diphtheria

(C) Nipah (D) Tuberculosis

4. Symptoms of a disease is mentioned below. Identify the disease.

Appearance of reddish scaly rashes that cause itching appear on the sole of the foot and between the toes.

(A) Ringworm (B) Athletes' foot

(C) Malaria (D) Filariasis

5. Identify the micro organism given below.

(A) Bacteria (B) Virus

(C) Fungus (D) Protozoa

6. Select the disease caused by fungus from the following.

(A) Wilt disease in brinjal (B) Quick wilt in pepper

(C) Bunchy top of banana D) Blight disease in paddy

Questions from 7 to 12 carry 2 score each.

7. Some lifestyle diseases and their reasons are given in the box. Make suitable word pairs as given in example

Eg: Hypertension - decrease in the diameter of arteries due to deposition of fat.

Stroke, Fatty liver, Deficiency of insulin or its malfunctioning, Deposition of fat in liver, Rupture of blood vessels in brain

8. Analyse the symptoms that are given in the box and answer the following questions.

Inflammation of the liver, when the flow of bile secreted by the liver is blocked, an increase in the level of bile pigment called bilirubin in blood is noticed. This imparts dark yellow colour to the mucus membrane, white portion of the eyes and the nails.

a) Identify the disease.

b) Name the causative organism.

c) How this disease is transmitted from one person to other?

9. Arrange the following statements in the table given below.

a) Multiply by binary fission.

b) DNA or RNA molecule within a protein coat.

c) The toxins produced by them destroy cells and cause disease.

d) Multiplies by taking control over the genetic mechanism of the host cells.

Bacteria	**Virus**
.	
.	

10. List any four concepts that can be included in an awareness programme conducted by science club about Rat fever.

11. The following symptoms are seen in people in a locality.

High fever with shivering and profuse sweating , headache, vomiting, diarrhoea, anaemia.

a) Identify the disease.

b) Name the pathogen of the disease.

c) What are the precautions to be taken to prevent the transmission of disease?

12. Science club decided to conduct a seminar to give awareness about cancer. List any four concepts that can be included in the seminar.

Questions from 13 to 15 carry 3 score each.

13. "Smoking harmfully affects internal organs." Explain how it affects brain, heart and lungs.

14. Complete the table using the hints from the box.

Plasmodium,Sickle cell anaemia , Blood loss even from a small wounds, Malaria, Deformities in the sequencing of amino acids which are the building blocks of haemoglobin, Cough and fatigue, Haemophilia, *Mycobacterium tuberculosis*

Disease	Cause	Symptoms
i.....	Genes which synthesize blood clotting proteins become defective.	ii..... .....
iii.....	iv.....	decreases oxygen carrying capacity of RBC
Tuberculosis	v.....	vi.....

15. Analyse the following news paper report and answer the questions.

The measures to control Nipah become effective.

Kozhikode: Test report of 17 samples reported negative for Nipah.

a) Name the pathogen mentioned in newspaper report.

b) Write the natural vector of this pathogen.

c) List the situations that enable the pathogen to enter the body.

Question 16 and 17 carry 4 score each

16. Observe the poster and answer the following questions.

"1st December world AIDS day " Participate in awareness programme on dreadful disease —AIDS

a) Identify the microorganism that cause AIDS.

b) Write the conditions that makes AIDS fatal?

c) Complete the table.

Situations through which AIDS spread	Situations through which AIDS does not spread

17. Analyse the facts from Anoop's Science diary and answer the following.

Symptoms of a disease : Fever ,Throat pain, Ash coloured thick coating in the throat.

a) Identify the disease and give the name of the pathogen.

b) Give reason for the formation of ash coloured thick coatings in the throat.

c) Write the method of treatment of this disease.

Unit 4

KEEPING DISEASES AWAY

ANSWER KEY

Qn.no	Scoring indicators	Score
1	Bacteria	1
2.	C) AIDS, Others are the diseases transmitted through mosquitoes	1
3.	(C)Nipah	1
4.	(B) Athletes' foot	1
5.	(B) Virus	1
6.	(B) Quick wilt in pepper	1
7.	Stroke - Rupture of blood vessels in brain Fatty liver - Deposition of fat in liver	1 1
8.	a) Hepatitis b) Virus c) Transmitted through contaminated food and water, blood components and excreta of the patient.	½ ½ 1
9.	Bacteria - a) Multiply through binary fission. c) The toxins produced by them destroy cells and cause disease. Virus - b) DNA or RNA molecule within a protein coat. d) multiplies by taking control over the genetic mechanism of the host cells.	½ ½ ½ ½
10.	Rat fever is a bacterial disease. They enter the body and multiply through binary fission. The toxins produced by them destroy cells and cause disease. The bacteria that comes out through the urine of rat, dog and certain other animals remain alive in stagnant water and moisture. When bacteria reach blood through wounds, they affect body cells and produce certain toxins.	2
11.	a) Malaria b) Plasmodium /protozoa c) Control the mosquitoes. Avoid situations that lead to the multiplication of pathogens and vectors. It is our duty to keep our environment clean.(Any two points)	½ ½ ½+ ½

12.	Cancer is caused by the uncontrolled division of cells and their spread to other tissues. This may be due to environmental factors, smoking, radiations, virus, hereditary factors, etc. The cancer cells are spread to other parts of the body through blood and lymph. Surgery, chemotherapy, radiation therapy etc. are extensively used in the treatment of cancer. (Any four points)	2
13.	Heart - Hypertension, Loss of elasticity of arteries, Decrease in functional efficiency.(any two) Lungs— Lung cancer, Bronchitis, Emphysema.(any two) Brain - Stroke, Addiction to nicotine.	½+½ ½+½ ½+½
14	i -Haemophilia ii -Blood loss even from a small wound iii - Sickle cell anaemia iv - Deformities in the sequencing of amino acids which are the building blocks of haemoglobin v - Mycobacterium tuberculosis	½ ½ ½ ½ ½
15.	vi - Cough and fatigue a) Nipah virus b) Fruit eating bats c) Saliva and urine of bats, remains of fruits eaten by bats, through pigs (Any two points)	½ 1 1 ½ + ½
16	a) HIV/Human Immunodeficiency Virus b) The number of lymphocytes decreases considerably and reduces the immunity of the body. Various other pathogens which enter the body insuch a situation make the condition of AIDS even more fatal. c) **Spread-** Through sexual contact with HIV infected person, infected mother to the foetus , By sharing needle and syringe contaminated with HIV components, Through the reception of blood and organs contaminated with HIV (any two points) **Not spread -** by touch, shaking hands, coughing, sneezing etc. • through insects like mosquitoes, houseflies etc. • by staying together and sharing food. • by using the same toilet. • by taking bath in the same pond. (any two points)	1 1 ½ + ½ ½ + ½

17,	a) Diphtheria , *Corynebacterium diphtheriae* b) Cells in the mucus membrane which are destroyed by the toxins produce an ash coloured thick coating in the throat within two or three days. c) Antitoxins which act against the toxins are used to protect the uninfected cells. Vaccination is the best preventive method.	½ + ½ 1 1 + 1

Unit 5

SOLDIERS OF DEFENSE

Score : 35
Time : 70 mts

Questions from 1 to 6 carry 1 score each.

1. Which of the following diseases cannot be prevented through vaccination?

   a) Sickle cell anaemia

   b) Tetanus

   c) Measles

   d) Hepatitis B

2. Identify the word pair relationship and fill in the blanks.

   a) Modern medicine : Hippocrates

      Homeopathy : .....

   b) Epidermis : Keratin

      Sebaceous gland : .....

3. Find the odd one and write the common feature of others.

   Cardiology, ENT, Neurology, BCG

4. Which among the following blood cells can specifically identify and destroy pathogens.

   a) Monocyte

   b) Eosinophil

   c) Lymphocyte

   d) Neutrophil

5. Select true statements from the following.

   a) T - Lymphocytes produce antibodies that destroy the pathogens.

   b) B - Lymphocytes produce antibodies and neutralise the toxin of the antigens.

   c) B - Lymphocytes destroy cancer cells.

   d) T - Lymphocytes destroy the cells affected by virus.

   i) a and b are correct

ii) b and c are correct

iii) b and d are correct

iv) a and d are correct

6. Name the scientists related with the following statements.

a) Started immunization

b) Discovered antibiotics

Questions from 7 to 12 carry 2 score each.

7. Analyse the statement and answer the following

"Though antibiotics are effective medicines, their regular use create many side effects."

Do you agree with this statement? Substantiate.

8. A person who has lost a lot of blood in an accident needs A^{+ve} blood.

a) Can he receive B^{+ve} blood? Why?

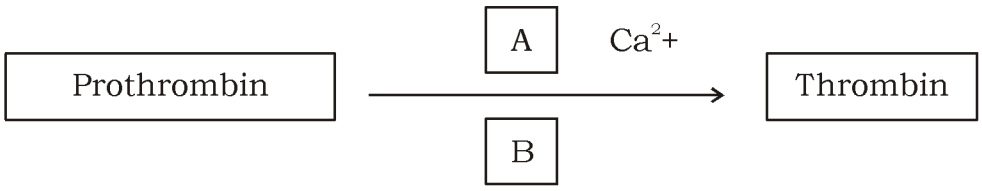
b) Write the scientific basis of grouping of blood into positive and negative.

9. Name of some modern diagnostic tools are given in box A and its uses in box B. Match them suitably.

A
• ECG
• EEG
• CT Scanner
• MRI Scanner

B
• to get three- dimensional visuals of internal organs.
• to record electric waves in the heart muscle.
• to record electric waves in the brain.
• to get three - dimensional visuals of internal organs with the help of computer, using X-rays.

10. Observe the illustration and answer the following questions.



a) 'A' is a vitamin and 'B' is an enzyme. Name them.

b) How blood clot is formed in the consequent chemical process?

11. Complete the steps based on the formation of fever.

Pathogens enter the body.

↓

(a)

↓

Chemical substances produced by white blood cells raises the body temperature.

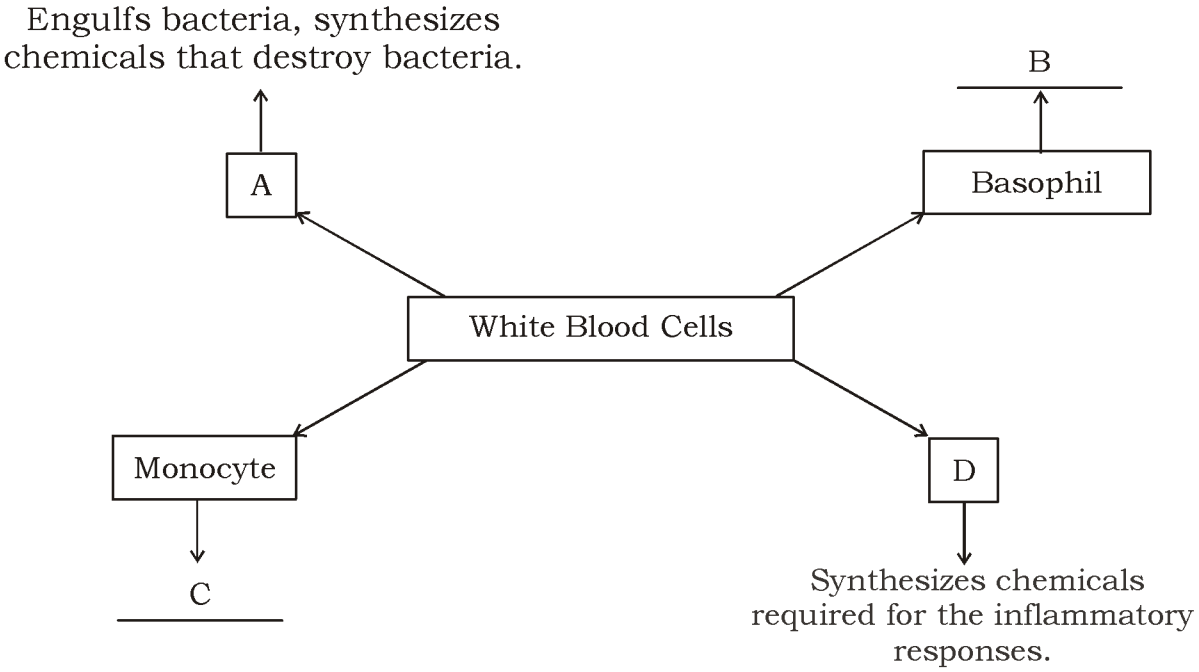
↓

(b)

↓

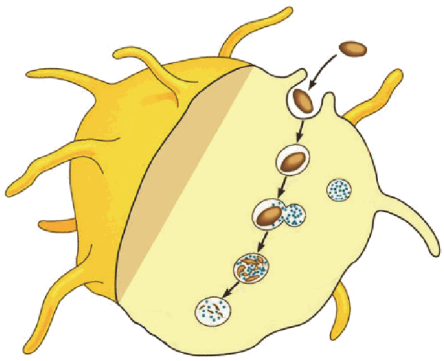
Increases the effect of phagocytosis.

12. Complete the word map about white blood cells.



Questions from 13 to 15 carry 3 score each.

13. Observe the illustration and answer the following questions.



a) Name the process indicated here.

b) Which are the WBCs involved in this process?

c) Rearrange the following stages based on the process mentioned here.

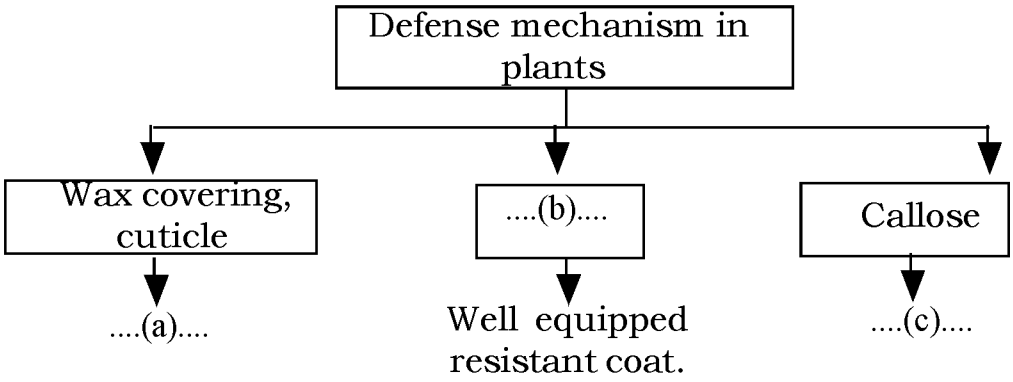
i) Lysosome combines with membrane sac.

ii) Pathogens are degenerated and destroyed by the enzyme in lysosome.

iii) Phagocytes reach near the pathogen.

iv) Engulfs pathogen in the membrane sac.

14. Complete the illustration of defense mechanisms in plants.



15. Using the following statements prepare a flow chart of inflammatory response.

i) Damaged cells produce certain chemical substances.

ii) White blood cells reach the wound site through the walls of the capillaries.

iii) Cells get damaged by a wound or infection.

iv) Blood capillaries dilate.

v) More white blood cells and plasma reach the wound site.

vi) White blood cells engulf and destroy germs.

Questions 16 and 17 carry 4 score each.

16. Analyse the collage and answer the follwing.

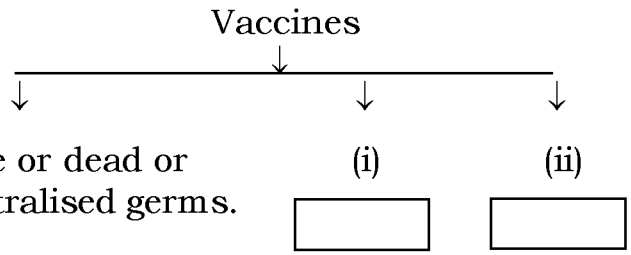
COVID-19 : Early vaccination is useful to safeguard our lives from this deadly disease.

People who are vaccinated with covid vaccine are reported to have reduced covid related diseases.

Vaccination is available free of cost in all government covid vaccination centres.

a) What is the significance of vaccines in immunization ?

b) Complete the illustration of components of vaccine.



c) Name the diseases that can be prevented by the following vaccines.

i) OPV ii) TT

d) How vaccines protect us from pathogens?

17. Analyse the given statement and answer the following -

'Everyone cannot receive blood from all blood groups.'

a) Do you agree with the above statement? Justify.

b) Complete the table.

Blood Group	Antigens	Antibodies
A	A	.....(i).....
B	.....(ii).....	a
.....(iii).....	A and B	Nil
O	Nil	.....(iv).....

Unit 5

SOLDIERS OF DEFENSE

Answer key

Qn. No.	Scoring Indicator	Score
1.	a) Sickle cell anaemia	1
2.	a) Sammuel Haniman	½
	b) Sebum	½
3.	B.C.G. All others are specializations in modern medicine.	½+½
4.	c) Lymphocyte	1
5.	iii. b and d are correct	1
6.	a) Edward Jenner b) Alexander Fleming	½+½
7.	Yes, regular use of antibiotics create many side effects. • Develops immunity in pathogens against antibiotics. • Destroys useful bacteria in the body. • Reduces the quantity of some vitamins in the body.	½ 1½
8.	(a) No. On receiving unmatching blood, the antigen present in the donor's blood and the antibody present in the recipient's blood will react with each other and form a blood clot. b) The blood groups in which Rh factor (antigen D) is present are known as positive blood groups and those without Rh factor are called negative blood groups.	1 1
9.	ECG - To record electric waves in the heart muscle. EEG - To record electric waves in the brain. CT Scanner - To get three - dimensional visuals of internal organs with the help of computer, using X-rays. MRI Scanner - To get three - dimensional visuals of internal organs.	½ ½ ½ ½
10.	a) A- Vitamin K B - Thromboplastin b) Thrombin converts fibrinogen into fibrin. The red blood cells and platelets get entangled in the network of fibrin fibres to form the blood clot.	½+½ ½+½
11.	a. The presence of toxins produced by the pathogens stimulate the white blood cells. b. The rise in body temperature reduces the rate of multiplication of pathogens.	1 1
12.	A. Neutrophil	½

	B. Dilates blood vessels/stimulates other white blood cells (any one) C. Engulfs and destroys germs D. Eosinophil	 ½ ½ ½
13.	a) Phagocytosis b) Monocyte, Neutrophil c) iii, iv, i, ii	1 ½+½ ½+½
14.	a) Prevents the entry of germs through leaves b) Cell wall c) The germs that have crossed the cell wall are prevented	1 1 1
15.	iii, i, iv, v, ii, vi	3
16.	a) Vaccines are the substances used for artificial immunization. b) i) Neutralised toxins ii) Cellular parts of the pathogens c) i) OPV - Polio ii) TT - Tetanus d) Vaccines act as antigens that stimulate the defense mechanism of the body. Antibodies are formed in the body against them. These antibodies are retained in the body which in future protects he body from the pathogen responsible for the same disease.	1 ½+½ ½+½ 1
17.	a) Yes. On receiving unmatching blood, the antigen present in the donor's blood and the antibody present in the recipient's blood will react with each other and form a blood clot. b) i) b ii) B iii) AB iv) a and b	½ ½+½+½ ½ ½ ½ ½

Unit 6

UNRAVELLING GENETIC MYSTERIES

Score : 35
Time : 70 mts

Questions from 1 to 6 carry 1 score each.

1. Identify the word pair relationship and fill the missing word. Write the relation between the pairs also.

   TT : Tall :: Tt : .....

2. Complete the statement.

   The transmission of features of parents to offsprings is termed as ... .

3. Select the correct answer.

   In a DNA molecule the long strand is made up of

   (A) Nitrogen bases and phosphate (B) Adenine and guanine

   (C) Sugar and phosphate (D) Adenine and thymine

4. Find the odd one. Write the common feature of others.

   Adenine, Guanine, Uracil, Cytosine

5. Who were presented the double helical model of DNA?

6. The skin colour of people living in various parts of the world is different. Write the reason.

Questions from 7 to 12 carry 2 score each.

7. Complete the table.

	DNA	**RNA**
Number of strands	....(A).....	Single strand
Type of sugar	.....(B).....	.....(C).....
Nitrogen bases	Adenine, thymine, guanine and cytosine	.....(D).....

8. The hybridization experiment conducted on the basis of two characters in pea plants is illustrated below. Observe the illustration and answer the questions given below.

Tall with round seed X Dwarf with wrinkled seed

Tall with round seed (First generation)

(a) Which are the new combinations of characters different from parents appeared in the second generation?

(b) What is the reason for new combinations of characters different from parents appeared in the second generation?

9. Select the correct statements.

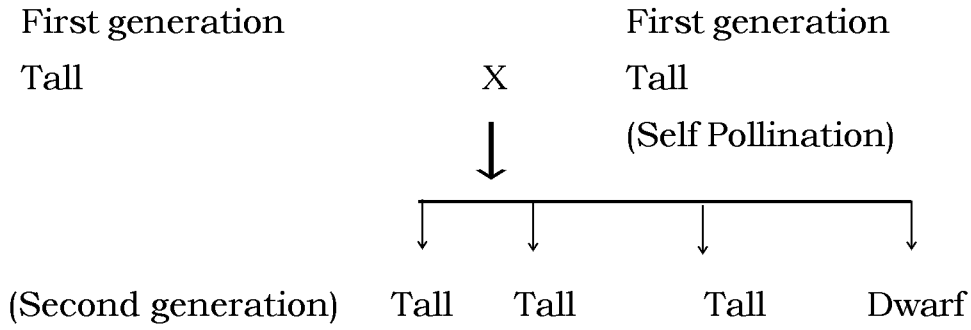
Statement (i) - A gene that controls a character has different forms. They are called alleles.

Statement (ii) - The allele that determines the recessive trait in the first generation is generally indicated by a capital letter and the allele that determines the dominant trait is indicated by a small letter.

Statement (iii) - The branch of science that deals with heredity and variations is called Genetics.

Statement (iv) - James Watson is considered as the Father of Genetics.

10. The production of second generation in the hybridization experiment carried out by Mendel based on the trait height are illustrated below. What are the inferences made by Mendel from this experiment?



11. The chromosomes of the mother determine whether the child is male or female. Substantiate your opinion as a science student.

12. The statements related to chromosomes in humans are given below. Make corrections (underlined portion) if any, in the statement given below.

(a) There are 46 chromosomes in human beings.

(b) Sex chromosomes are of four types.

(c) Females have two X chromosomes and Males have one X chromosome and one Y chromosome.

(d) The genetic makeup of female is 44 + XY.

Questions from 13 to 15 carry 3 score each.

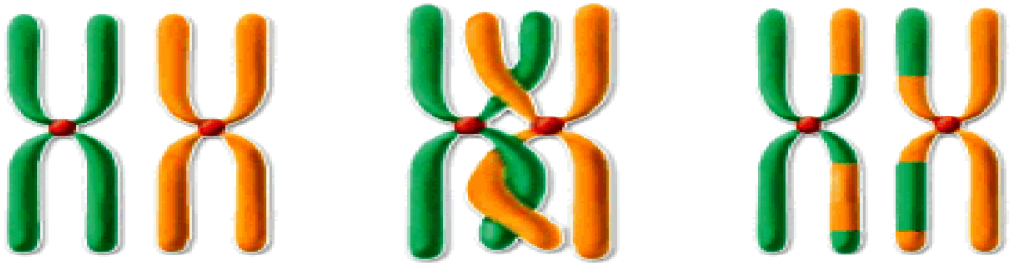
13. Mutations bring about changes in genes leading to variations in characters.

(a) What are mutations?

(b) What are the causes of mutations?

(c) What is the role of mutations in causing variations?

14. Observe the illustration and answer the questions given below.

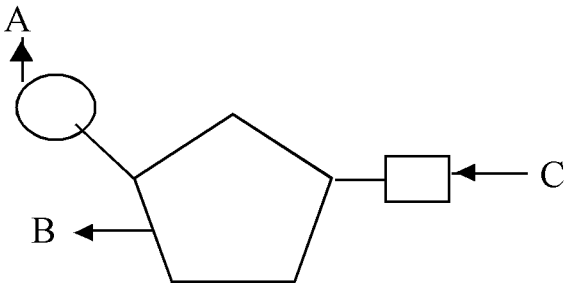


Stage 1 Stage 2 Stage 3

(a) Identify the process.

(b) What is the role of this process in causing variations?

15. Observe the illustration and answer the questions given below.



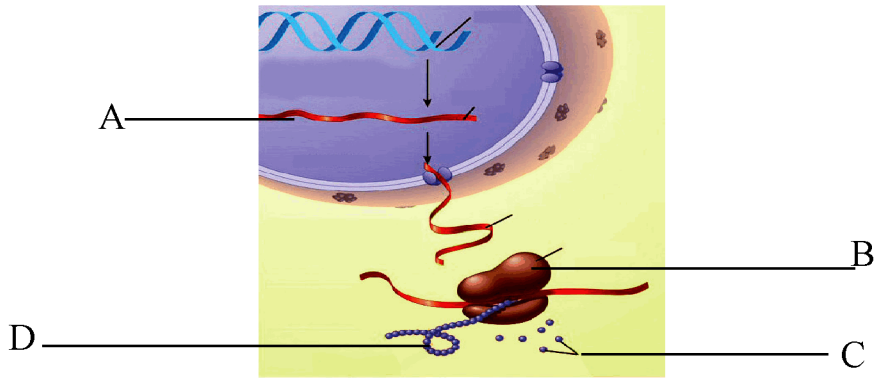
(a) Identify the illustration.

(b) Identify the parts indicated as A,B.

(c) What is the peculiarity of the part indicated as C?

Questions from 16 to 17 carry 4 score each.

16. Observe the illustration and answer the questions given below.



(a) Identify the process.

(b) Identify the parts indicated as A,B,C,D.

(c) What is the role of part indicated as A?

17. Based on the hybridization experiment conducted on the basis of two characters in pea plants, complete the table related to the allele structure of second generation plants.

Self pollination in first generation

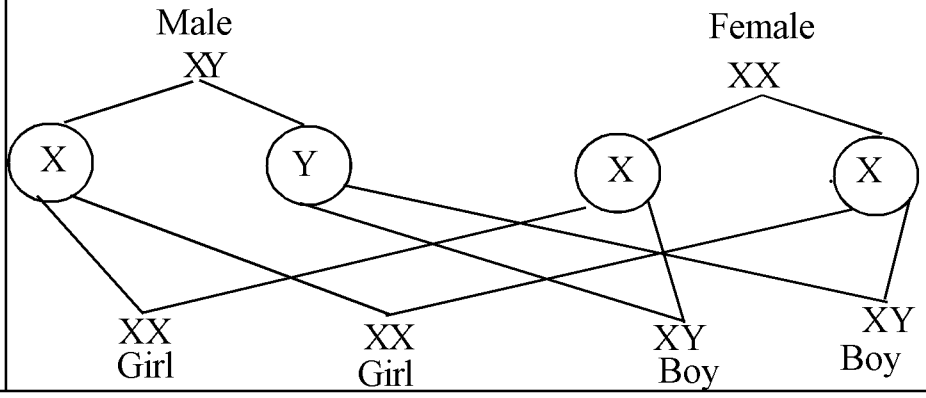
Tall with axial flowers X Tall with axial flowers

TtAa TtAa

Gametes	TA	Ta	tA	ta
TA	TTAA Tall with axial flowers	.....(i).....	.....(ii).....	TtAa Tall with axial flowers
Ta	.....(iii).....	TTaa Tall with terminal flowers	TtAa Tall with axial flowers	.....(iv).....
tA	TtAA Tall with axial flowers	.....(v).....	ttAA Dwarf with axial flowers	.....(vi).....
ta	.....(vii).....	Ttaa Tall with terminal flowers	.....(viii).....	ttaa Dwarf with terminal flowers

Unit 6

UNRAVELLING GENETIC MYSTERIES
ANSWER KEY

Qn. No.	Scoring Indicator	Score
1	Tall, Alleles and Traits.	½+½
2	Heredity	1
3	(C) Sugar and phosphate	1
4	Uracil, others are nitrogen bases seen both in RNA and DNA.	½+½
5	James Watson and Francis Crick	½+½
6.	Melanin, a pigment protein imparts colour to the skin. The rise or fall in the production of melanin is due to difference in the function of alleles of genes responsible for skin colour.	1
7.	(A) Double strand (B) Deoxyribose sugar (C) Ribose sugar (D) Adenine, uracil, guanine and cytosine	½+½ ½+½
8.	(a) Tall with wrinkled seed, Dwarf with round seed (b) Mendel explained that the appearance of variations in offsprings (characters not present in previous generation) is due to the independent assortment of each character.	1 1
9.	Statement (i), (iii)	1+1
10.	The traits that remain hidden in the first generation appear in the second generation.The ratio of the dominant and the recessive traits in the second generation is 3 : 1.	1+1
11.	It is not fair.  	½ 1½

	OR It is not fair. The XY chromosomes of the father determine whether the child is male or female. Child with XX sex chromosomes is female and one with XY sex chromosomes is male.	½ 1½
12.	(b) Sex chromosomes are of two types. (d) The genetic makeup of female is 44 + XX.	1 1
13.	(a) A sudden heritable change in the genetic constitution of an organism is called mutation. (b) This may occur due to defects in the duplication of DNA, certain chemicals, radiations, etc. (c) Mutations bring about changes in genes which can be transmitted over generations and thus leading to variations in characters.	1 1 1
14.	(a) Crossing over in Chromosomes. (b) As a result of crossing over of chromosomes, part of a DNA crosses over to become the part of another DNA. This causes a difference in the distribution of genes. When these chromosomes are transferred to the next generation, it causes the expression of new characters in offsprings.	1 1+1
15.	(a) Nucleotide (b) A - Phosphate B - Sugar molecule (c) C - Nitrogen Base - is the molecule that contains nitrogen and is alkaline in nature.	1 1 1
16.	(a) Action of genes/ Protein synthesis. (b) A - mRNA B - Ribosomes C- Amino acids D -Protein (c) DNA does not participate directly in protein synthesis. DNA performs its activities with the help of RNA. RNA that carries information from DNA reaches ribosome and controls protein synthesis.	1 ½+½ ½+½ 1
17	(i) TTAa - Tall with axial flowers (ii) TtAA - Tall with axial flowers (iii) TTAa - Tall with axial flowers (iv) Ttaa - Tall with terminal flowers (v) TtAa - Tall with axial flowers(vi) ttAa - Dwarf with axial flowers (vii) TtAa - Tall with axial flowers (viii) ttAa - Dwarf with axial flowers	4

Unit 7

GENETICS OF THE FUTURE

Score : 25
Time : 50 mts

Questions from 1 to 5 carry 1 score each.

1. Identify the word pair relationship of first pair and fill in the blanks.

   Genetic Scissor: Restriction endonuclease

   Genetic glue :.....

2. Which of the following is not a misuse of genetic engineering.

   a) Threat to indigenous varieties

   b) Bioweapons- A new challenge

   c) Genetic modification -violation of rights

   d) Pharm animals

3. Find the odd one and find out the common features of others.

   Gene therapy, Genetically modified animals and crops, Forensic test, Junk gene

4. Which of the following statements are not correct.

   a) The use of microorganisms and biological processes for various human requisites is called Biotechnology.

   b) The ability of fungi and bacteria to convert sugar into alcohol was utilised to make wine, appam and cake can be considered as a modern method of biotechnology.

   c) Genetic engineering is the modern form of biotechnology.

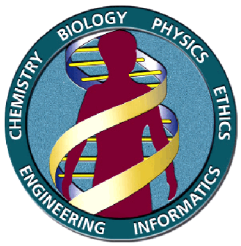
   d) Genetic engineering is the technology of controlling traits of organisms by bringing about desirable changes in the genetic constitution of organism.

   e) Human Genome Project was started in 1990 and completed in 1993.

5. Give two examples of genetically modified plant crops.

Questions from 6 to 10 carry 2 score each.

6. Observe the figure and answer the following questions.



a) What does this logo indicates?

b) What is the relevance of starting such a project?

c) Write the significants of this project?

7. Choose the suitable words related with the following statements from those given in the box.

a) The complete genetic material present in an organism.

b) The non functional genes present in DNA .

c) The number of functional genes in human genome.

d) The number of genes in human genome identical to those in bacteria.

About 24000 , Junk genes, 200, Genome

8. Correct mistakes, if any, in the underlined word of the following statements.

a) A gene from one cell is transferred to another cell by using suitable vectors.

b) Gene mapping is a method of treatment in which the genes that are responsible for diseases are removed and normal functional genes are inserted in their place.

c) DNA of the skin, hair, nail, blood and other body fluids obtained from the place of murder, robbery etc., helped to identify the suspected persons through the DNA finger printing.

d) Alec Jeffreys paved the way for DNA testing.

e) There is only 20 percent difference in DNA among humans.

9. "There are certain limitations in producing insulin." Analyse the statement and answer the following questions.

a) What are the limitations in producing insulin?

b) How can we overcome this by the researches in this field?

10. What is the role of genetic engineering in the treatment of diseases? Give the name of this method of treatment.

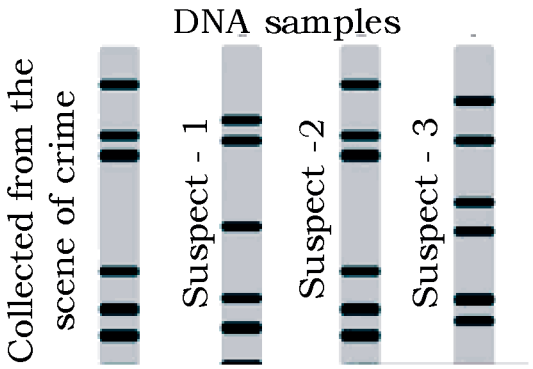
Questions from 11 to 12 carry 3 score each.

11. Make suitable pairs from the words, given in the box.

Viral diseases, Interferons, Insulin, Growth disorders, Endorphin, Somatotropin, Diabetes, Pain

Sample: Insulin - Diabetes

12. Observe the figure and answer the following questions.



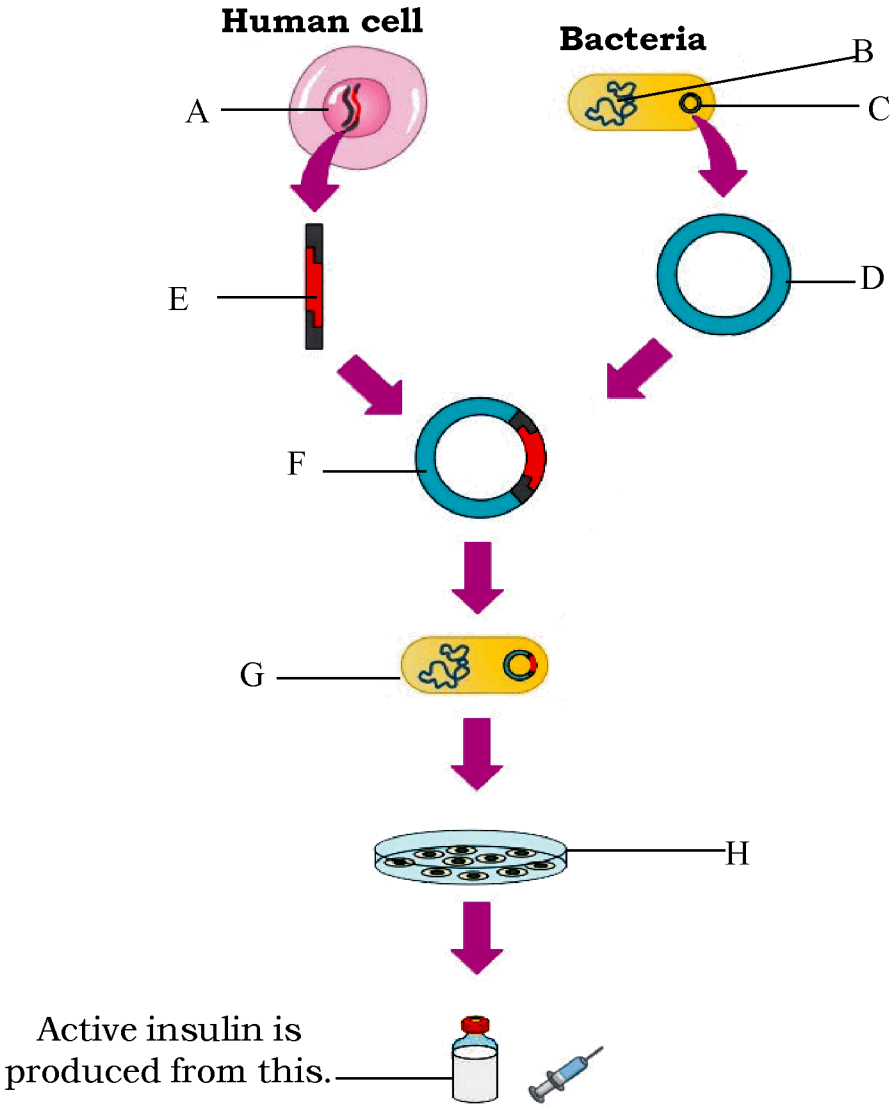
a) Which technology is mentioned above ?

b) What is the basis of this testing?

c) Write down two uses of this technology ?

Question 13 carries 4 score.

13. The various stages in the production of bacteria that are capable of producing insulin are given below. Complete the illustration by selecting suitable words from the box.



Isolation of Plasmid, Bacteria that multiply in the culture medium produce inactive insulin, Joining insulin gene with plasmid, Cutting of insulin gene, Plasmid with ligated insulin gene is inserted in to bacterial cell, Human DNA, DNA of the bacterium, Plasmid

Unit 7

GENETICS OF THE FUTURE

ANSWER KEY

Qn.no	Scoring indicators	Score
1	Ligase	1
2.	d) Pharm animals	1
3.	Junk gene, others are scope of genetic engineering	1
4.	b) The ability of fungi and bacteria to convert sugar into alcohol was utilised to make wine, appam and cake can be considered as a modern method of biotechnology. e)Human genome project was started in 1990 and completed in 1993.	½+½
5.	Bt brinjal , Bt soyabean, Bt cotton, Bt maize (any two)	½+½
6.	a) Human Genome Project b) Even though science has progressed a lot, we couldn't control genetic diseases. We could not identify the exact gene responsible for a specific trait and its location before that project. c) The secrets of human genome were revealed. The technology known as gene mapping helped to identify the location of a gene in the DNA responsible for a particular trait.	½ ½ 1
7.	a) Genome b) Junk genes c) About 24000 d) 200	½ ½ ½ ½
8.	b) Gene Therapy is a method of treatment in which the genes that are responsible for diseases are removed and normal functional genes are inserted in their place. e) There is only 0.2 percent difference in DNA among humans.	1 1
9.	a) There are certain limitations in producing insulin using bacteria. The most important hurdle in this field is the culturing of bacteria. b) Researches in this field show that instead of this, medicines can be extracted from the blood or milk of genetically modified animals.	1 1

10.	a) Gene therapy is a method of treatment in which the genes that are responsible for diseases are removed and normal functional genes are inserted in their place. b) Gene therapy	1 1
11.	Interferons -Viral diseases Somatotropin -Growth disorders Endorphin- Pain	1 1 1
12.	a) DNA profiling/ DNA finger printing/ DNA testing b) The arrangement of nucleotides in each person differs. c) To identify real parents in cases of parental dispute and to identify persons found after long periods of missing due to natural calamities or wars, also to find out the real culprit from the suspected persons. (any two)	1 1 ½ + ½
13.	A. Human DNA B. Bacterial DNA C. Plasmid D. Isolation of plasmid E. Cutting of insulin gene F. Joining insulin gene with plasmid G Plasmid with ligated insulin gene is inserted into bacterial cell H. Bacteria that multiply in the culture medium produce inactive insulin	½ ½ ½ ½ ½ ½ ½ ½

Unit 8

THE PATHS TRAVERSED BY LIFE

Score : 30
Time : 1 hr

Questions from 1 to 5 carry 1 score each.

1. The organic molecule formed in Urey-Miller experiment.
   a) Glucose
   b) Amino acids
   c) Fatty acids
   d) Protein
2. Identify the word pair relationship and fill the missing word.
   Monosaccharide : Polysaccharide
   Amino acids : .....
3. Select the correct pair.
   a) Harold Urey - Mutation
   b) Hugo deVries - Natural selection
   c) Lamarck - Neo Darwinism
   d) Charles Darwin - Natural Selection

Find the odd one and write the common feature of others.

4. Nitrogen, Hydrogen, Oxygen, Carbon dioxide.
5. Gorilla, Monkey, Chimpanzee, Gibbon

Questions from 6 to 11 carry 2 score each.

6. The table related to geological time scale is given below. Complete the table.

3800 millions of years ago	.....(a).....
.....(b).....	Origin of prokaryotes
1500 millions of years ago	.....(c).....
.....(d).....	Origin of multicellular organisms

7. An explanation related to the history of evolution is given below as a flowchart. Observe the flowchart and answer the questions given below.

Giraffes with short necks	→	Giraffes faced food scarcity, they stretched their neck to reach out to tall trees.	→	Giraffes with long neck emerged through generations.

a) Which concept is explained through this?

b) This argument is not accepted by scientific world. Why?

8. The members in the history of human evolution and their peculiarities are given in the box. Make pairs as in the sample.

Sample : Homo erectus - Thick chin and large teeth

Homo sapiens, Thick chin and large teeth, Ardipithecus ramidus, Modern man, Homo erectus, Most primitive member of the human race.

9. The different species that exist today have a common ancestor. Justify this inference with the evidences provided by fossil study.

10. Analyse the table and answer the questions given below.

Organism	Difference from the aminoacids in the Beta chain of haemoglobin in man
Chimpanzee	No change
Gorilla	Difference of one amino acid
Rat	Difference of 31 amino acids

a) Which organism is the closest to humans from the evolutionary point of view?

b) What is the reason for this?

11. How does the interference of human beings with nature influence the process of evolution? How does this affect the existence of other organisms?

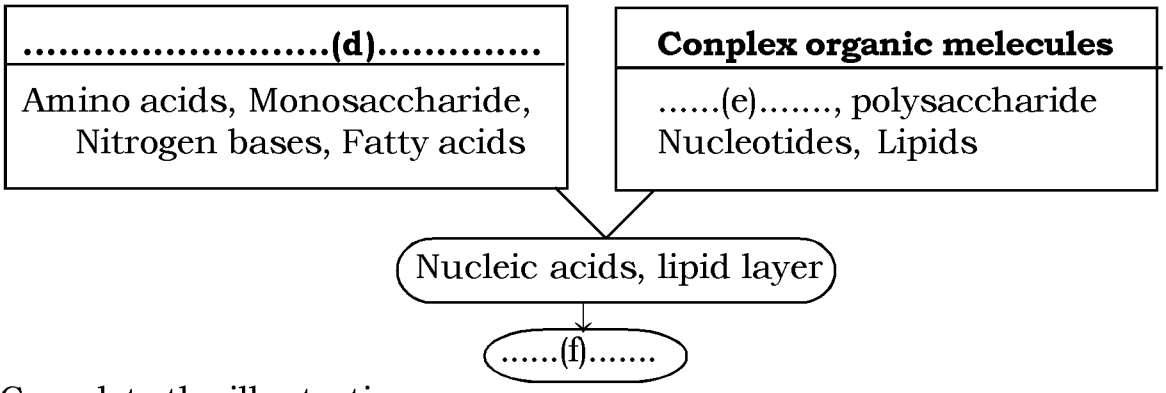
Questions from 12 to 14 carry 3 score each.

12. Complete the illustration related to chemical evolution.

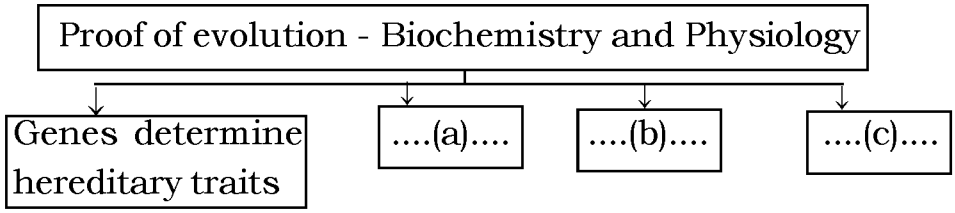
.....(a).....
• Gases like hydrogen, nitrogen, carbon dioxide, methane, ammonia, water vapour, hydrogen sulphide etc • No free oxygen

Sources of energy
.....(b)..... ultraviolet radiations .....(cs).....

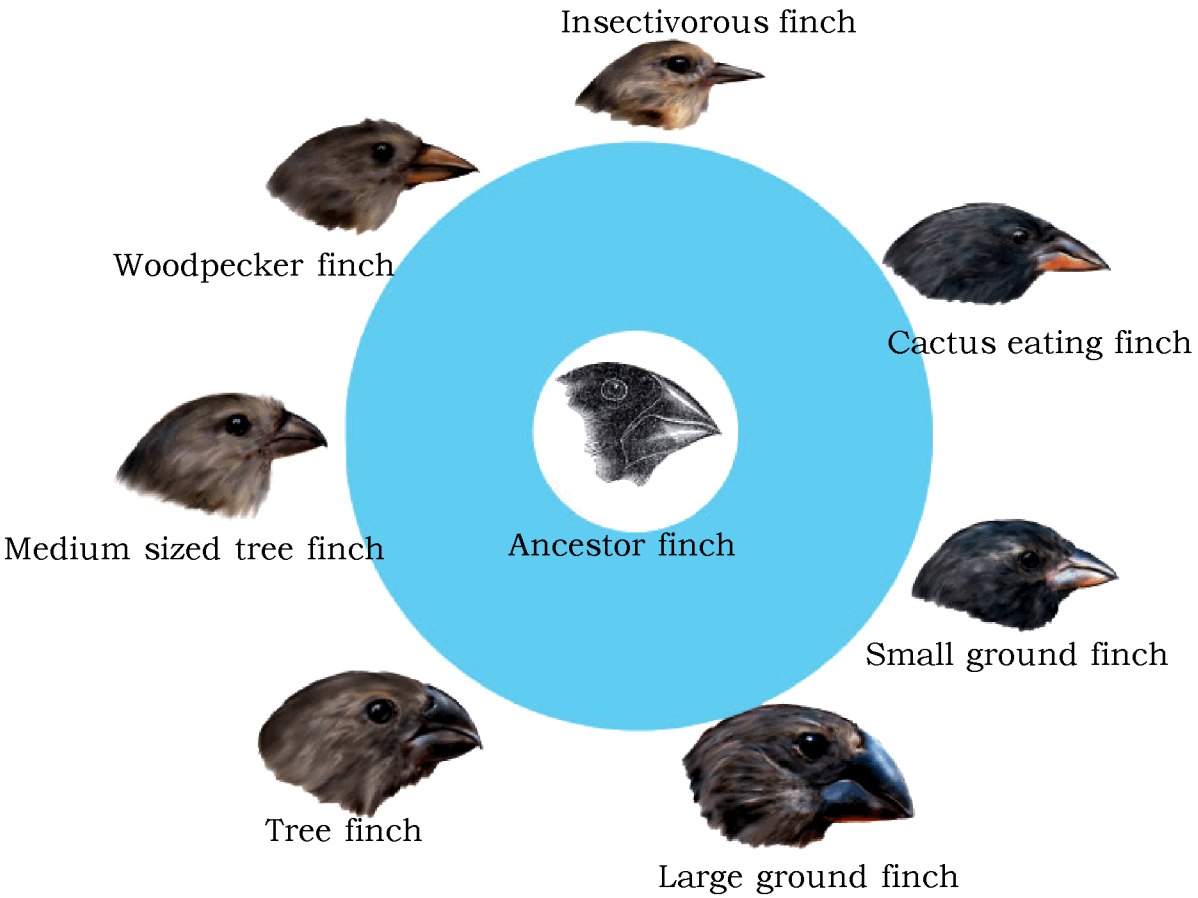
Condensation of water vapour present in the atmosphere and the resulting incessant rain led to the formation of oceans.



13. Complete the illustration.



14. The peculiarities of finches studies by Darwin in the Galapagos island is illustrated here. Observe the illustration and anwer the questions given below.

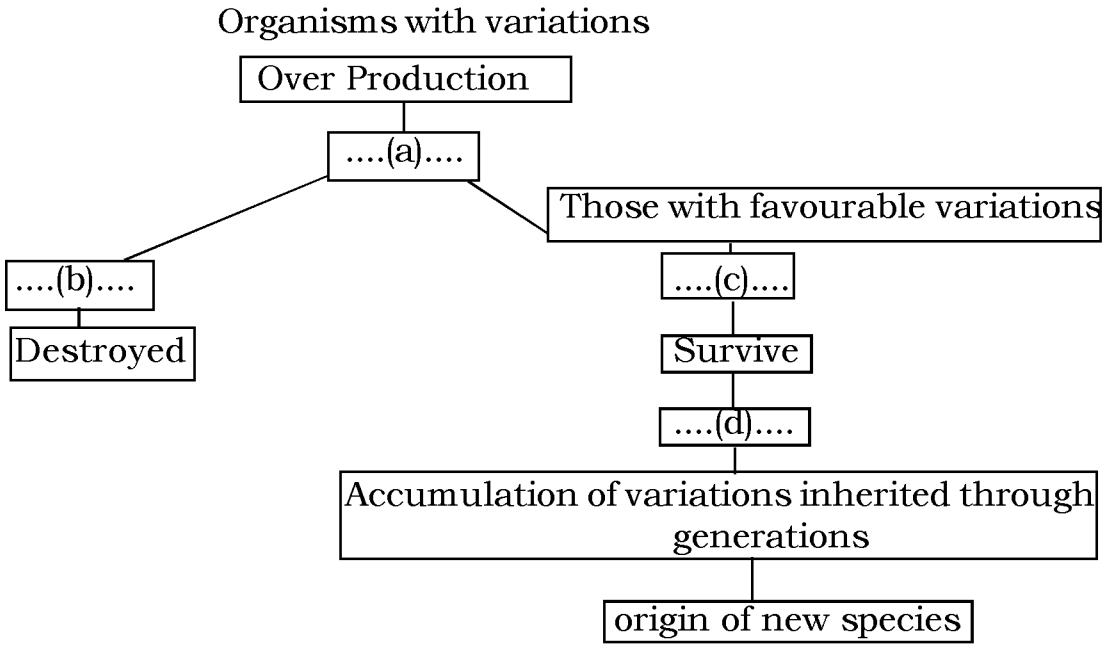


a) Which peculiarity of the finches attracted Darwin?

b) How do these peculiarities help finches in their survival?

Question 15 carry 4 score.

15. Observe the illustration and answer the questions given below.



i) Complete the illustration.

i) Which theory is indicated by the illustration?

ii) Name the scientist, who formulated this theory.

Unit 8

THE PATHS TRAVERSED BY LIFE

Answer key

Qn. No.	Scoring Indicator	Score
1.	(b) Amino acids	1
2.	Proteins	1
3.	(d)	1
4.	Oxygen, others are gases seen in the atmosphere of primitive earth	½+½
5.	Monkey, others are members of Hominoidea	½+½
6.	a) Origin of life on earth b) 3500 millions of years ago c) Origin of eukaryotes d) 1000 millions of years ago	½ ½ ½ ½
7.	a) The characters accumulate through generations and lead to the formulation of new species. b) These acquired characters are not inheritable.	1 1
8.	Homo sapiens - Modern man Ardipithecus ramidus - Most primitive member of the human race	1 1
9.	Primitive fossils have simple structure, recently formed fossils have complex structure, certain fossils are connecting links between different species (Any two)	1+1
10.	a) Chimpanzee b) Man and chimpanzee has no difference from the amino acids in the beta chain of haemoglobin.	1 1
11.	Biodiversity is on a dangerous decline due to the interference of human beings. The reckless interference of human beings affect the existence of other organisms.	1+1
12.	a) Atmosphere of primitive earth. b) Thunder and lightning c) Volcanic eruptions d) Simple organic molecules e) Protein f) Primitive cell	½ ½ ½ ½ ½ ½
13.	a) Enzymes control chemical reactions. b) Energy is stored in ATP molecules. c) Carbohydrate, proteins and fats are the basic substances.	1 1 1

14.	a) Peculiarity of the structure of beaks b) The finches that Darwin observed, had beaks adapted to their feeding habits. Insectivorous finches have small beaks and those feed on cactus plants have long and sharp beaks. There were also woodpecker finches that used sharp beaks to pick small twigs for feeding on worms from the holes in tree trunks. The ground finches that feed on seeds with large beaks also present.	1 2
15.	i) (a) Struggle for existence (b) Those with no favourable variations (c) Natural selection (d) Favourable variations are transferred to the next generation. ii) Theory of Natural selection iii) Charles Robert Darwin	½ ½ ½ ½ 1 1