

CHAPTER – 3 STRUCTURE AND FUNCTIONS OF HUMAN BODY
(1 MARK -1Q) (2 MARKS – 1Q) (5 MARKS -1 Q)

PART - A

1. Unipolar neurons are found in the _____.

- i) Brain ii) Spinal Cord iii) Embryonic nervous tissue iv) Adult nervous tissue

Ans : iii) Embryonic nervous tissue

2. The sensory organs contain _____.

- i) Unipolar neuron ii) Bipolar neuron iii) Multipolar neuron iv) Medullated neuron

Ans : ii) Bipolar neuron

3. The part of brain which controls emotional reactions in our body is _____.

- i) Cerebellum ii) Cerebrum iii) Thalamus iv) Hypothalamus

Ans : iv) Hypothalamus

4. One of the following is a part of the brain stem. Pick it out.

- i) Forebrain and midbrain ii) Midbrain and hindbrain
iii) Forebrain and hindbrain iv) Forebrain and spinal cord

Ans : ii) Midbrain and hindbrain

5. Spinal nerves are _____.

- i) sensory nerves ii) motor nerves iii) mixed nerves iv) innervating the brain

Ans : iii) mixed nerves

6. An endocrine gland found in the neck is _____.

- i) adrenal gland ii) pituitary gland iii) thyroid gland iv) pancreas

Ans : iii) thyroid gland

7. An endocrine gland which is both exocrine and endocrine is the _____.

- i) pancreas ii) pituitary iii) thyroid iv) adrenal

Ans : i) pancreas

8. Normal blood glucose level in 1dl of blood is _____.

- i) 80-100 mg/dl ii) 80-120 mg/dl iii) 80-150 mg/dl iv) 70-120 mg/dl

Ans : ii) 80-120 mg/dl

9. The "T" lymphocytes are differentiated to resist infection in the _____.

- i) parathyroid gland ii) lymph gland iii) thymus gland iv) adrenal gland

Ans : iii) thymus gland

10. In Meiosis-I, the pairing of homologous chromosomes take place during _____ stage.

- i) leptotene ii) zygotene iii) pachytene iv) diplotene

Ans : ii) zygotene

11. The two systems of the human body which help in the control and co-ordination of metabolic activities are _____.

- i) digestive and circulatory ii) respiratory and circulatory iii) excretory and skeletal iv) nervous and endocrine

Ans : iv) nervous and endocrine

12. Neurotransmitters are released at the synapse by _____.

- i) Tips of Dendrites ii) Synaptic Knobs iii) Organelles of Cyton iv) Myelin sheath of Axon

Ans : ii) Synaptic Knobs

13. The endocrine gland related to the immune system is _____.

- i) Thyroid ii) Thymus iii) Adrenal iv) Pineal

Ans : ii) Thymus

14. The hormone administered by doctors to a pregnant woman to help in childbirth during the time of natural delivery is _____.

- i) Oestrogen ii) Progesterone iii) Insulin iv) Relaxin

Ans : iv) Relaxin

15. The important event of meiosis is the crossing over. It occurs during _____.

- i) Leptotene ii) Pachytene iii) Diplotene iv) Zygotene

Ans : ii) Pachytene

16. Reduction division is the process by which gametes are produced. The cells in which reduction division take place are _____.

- i) germinal epithelial cells ii) the sensory epithelial cells iii) cuboidal epithelial cells iv) columnar epithelial cells

Ans : i) germinal epithelial cells

17. In Amoeba, the cell division takes place _____

- i) involving changes in the chromatin reticulum
- ii) without involving changes in the chromatin reticulum
- iii) leading to reduction in the number of chromosomes
- iv) without dividing the nucleus

Ans : **ii) without involving changes in the chromatin reticulum**

18. Pick out the item which has sequential arrangement.

- i) zygotene -> Leptotene -> Pachytene -> Diplotene -> Diakinesis
- ii) Diakinesis -> zygotene -> Leptotene -> Pachytene -> Diplotene
- iii) Leptotene -> zygotene -> Pachytene -> Diplotene -> Diakinesis

Ans : **iii) Leptotene -> zygotene -> Pachytene -> Diplotene -> Diakinesis**

19. Polio is a viral disease and the affected child suffers from physical disability of limbs. Which system of the body is mostly affected due to this infection?

- i) Nervous system
- ii) Digestive system
- iii) Respiratory system
- iv) Excretory system

Ans : **i) Nervous system**

20. Blinking when a beam of light is suddenly focussed on the eyes and sudden withdrawal of hand upon touching a hot body are some of the examples of reflex actions. Which part of the central nervous system acts as the centre these actions?

- i) Forebrain
- ii) Spinal cord
- iii) Hindbrain
- iv) Synapse

Ans : **ii) Spinal cord**

21. The following are the parts of a neuron:

- a) Axon
- b) Terminal branches
- c) Cyton
- d) Dendrites

The correct pathway of a nerve impulse through these parts are _____.

- i) badc
- ii) dcab
- iii) bdac
- iv) adbc

Ans : **ii) dcab**

22. For minor surgeries in the body, doctors administer local anaesthesia to a part of the body so that the pain will not be felt by the patient. At which part, do you think, the nerve impulse is being arrested due to the effect of anaesthesia?

- i) at cyton
- ii) at axon
- iii) at synapse
- iv) in the middle of axon

Ans : **iii) at synapse**

23. Assertion (A) : All spinal nerves are mixed nerves.

Reason (R) : Each spinal nerve has a sensory root and a motor root.

- i) Both 'A' and 'R' are true and 'R' explains 'A'.
- ii) Both 'A' and 'R' are true but 'R' doesn't explain 'A'.
- iii) Only 'A' is true but 'R' is false.
- iv) 'A' is false but 'R' is true.

Ans : **i) Both 'A' and 'R' are true and 'R' explains 'A'.**

PART - B

24. Name the two systems which help in the control and co-ordination of metabolic activities. Write any one difference between them.

Ans : The two systems which help in the control and co-ordination of metabolic activities are

1. Nervous system and
2. Endocrine system

Nervous system	Endocrine system
The nervous system provides an organized network of point-to-point connections for quicker coordination	The endocrine system provides chemical integration through hormones.

25. Differentiate medullated neurons from non-medullated neurons. Where are they found in the nervous system?

Ans :

No.	Medullated Neuron	Non-Medullated Neuron
1.	The axon is enclosed by the white fatty myelin cover.	This neuron is not enclosed by the myelin sheath ; so it appears grayish in colour.
2.	They are also known as Myelinated neurons .	They are also known as Non-Myelinated neurons.
3.	This type of neuron is found in the white matter of our brain.	This type of neuron is found in the grey matter of cerebrum.

26. Name the part of the brain which regulates heart beat and respiration. Where is it located in the brain?

Ans : **Medulla oblongata** regulates of heart beat and respiration.

Location of Medulla oblongata - Medulla is the posterior most part of the brain where it merges with the spinal cord.

27. What is corpora quadrigemina? Name the functions associated with it.

Ans : The dorsal portion of the midbrain consists of four hemispherical bodies called **corpora quadrigemina**.

Functions : It controls and regulates various visual reflexes and optical orientation.

28. What are endocrine glands? Name the secretions of these glands. How do these secretions reach the target organs?

Ans : 1.The endocrine glands are ductless glands (without ducts) which is responsible for the chemical coordination of physiological processes to maintain the homeostasis.

2.The secretion of endocrine glands is known as **hormone**.

3.The hormones are carried by the blood from the site of production to the site of action.

29. Name the following endocrine glands: i) The master of endocrine orchestra ii) The dual gland

Ans : i) The master of endocrine orchestra – **Pituitary Gland**

ii) The dual gland – **Pancreas** (Islets of Langerhans)

30. Which hormone(s) is/are called i) Personality hormone ii) fight, flight and fright hormones.

Ans : i) Personality hormone - **Thyroxine**

ii) Fight, flight and fright hormones – **Adrenalin**

31. Name the male and female sex hormones. List out their functions.

Ans : A. Male sex hormone - **Testosterone (androgen)**.

Functions of Testosterone

1. Testosterone stimulates the growth of reproductive organs and the production of male gametes- the sperm.

2. Testosterone determines the secondary sexual characters in male, such as growth of facial hair, hoarse voice, broadening of shoulder, etc.

B. Female sex hormones – 1. Oestrogen 2. Progesterone and 3. Relaxin

Functions of female sex hormones

1. **Oestrogen** is responsible for growth of female reproductive organs and the appearance of secondary sexual characters in female, such as growth of pubic hair, soft voice, feminine body, etc.

2. **Progesterone** maintains pregnancy and regulates menstrual cycle.

3. **Relaxin** relaxes the muscles of the pelvic region at the time of childbirth.

32. In which sub-stages of meiosis-I do the following events occur?

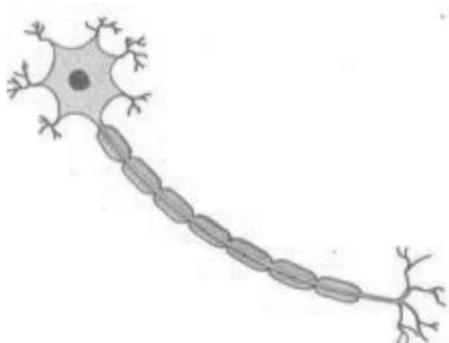
i) pairing of homologous chromosomes ii) terminalization iii) crossing over iv) formation of spindle apparatus.

Ans :

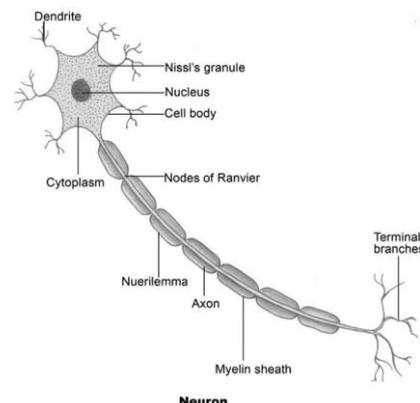
Event	Sub-stages of Meiosis - I
i) Pairing of homologous chromosomes	Zygotene
ii) Terminalization	Diplotene
iii) Crossing over	Pachytene:
iv) Formation of spindle apparatus.	Diakinesis

33. Copy the diagram and label any two parts in the group given:

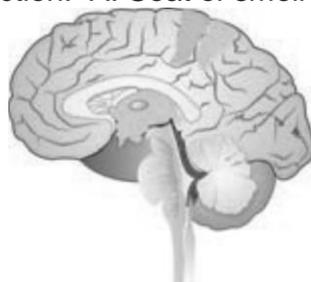
(cyton, axon, dendron, terminal branches)



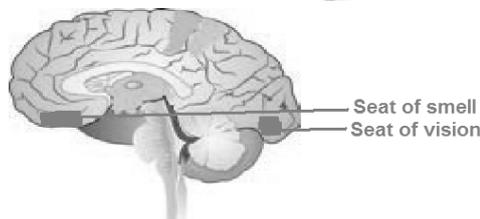
Ans:



34. The diagram is of the human brain. Shade the areas marked A and B in the parts of the brain, corresponding with the function. A. Seat of smell B. Seat of vision



Ans :



35. On the basis of the function performed, pick out the right statements.

- i) Pituitary gland secretes hormones and enzymes.
- ii) Thyroid gland secretes thyroxine and insulin.
- iii) Leydig cells produce testosterone hormone.
- iv) Pancreas produces enzymes and hormones.

Ans : iii) Leydig cells produce testosterone hormone.
iv) Pancreas produces enzymes and hormones.

36. Correct the statements, if they are wrong.

- i) Alpha cells produce insulin and beta cells produce glucagon. ii) Cortisone suppresses the immune response.
- iii) Thymus gland is a lymphoid mass. iv) Ovary produces eggs and androgen.

Ans : i) Alpha cells produce insulin and beta cells produce glucagon. – **False**

Corrected statement: Alpha cells produce glucagon and beta cells produce insulin.

ii) Cortisone suppresses the immune response. - **True**

iii) Thymus gland is a lymphoid mass. - **True**

iv) Ovary produces eggs and androgen. -**False**

Corrected statement: Ovary produces eggs and oestrogen.

37. Here are a few statements about the endocrine system in man. State whether each of them is true or false. If the statement is false write the correct statement.

- i) Endocrine system controls and co-ordinates the physical process of growth, reproduction and sustenance of life.
- ii) Endocrine glands are duct bearing glands which secrete chemical substances called hormones.
- iii) The pancreas is a dual gland. iv) Malfunctioning of the thymus gland causes goitre.

Ans : i) Endocrine system controls and co-ordinates the physical process of growth, reproduction and sustenance of life. - **True**

ii) Endocrine glands are duct bearing glands which secrete chemical substances called hormones. -**False**

Corrected statement: Endocrine glands are ductless glands which secrete chemical substances called hormones.

iii) The pancreas is a dual gland. - **True**

iv) Malfunctioning of the thymus gland causes goitre. –**False**

Corrected statement: Malfunctioning of the thyroid gland causes goitre.

38. Copy and complete the following table:

No.	Hormones of adenohypophysis	Functions and malfunctions
1	Somatotropic or growth hormone (STH or GH)	
2		2. It stimulates the growth of thyroid gland and produces thyroxine.

Ans :

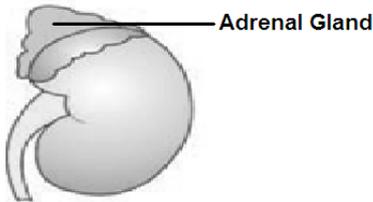
No.	Hormones of adenohipophysis	Functions and malfunctions
1	Somatotropic or growth hormone (STH or GH)	<p>1.Function: It contributes growth in general.</p> <p>Malfunitions</p> <p>1.Less production in children – <i>dwarfism</i> with retarded growth</p> <p>2.Excess production in children – <i>gigantism</i> with excess growth</p> <p>3.Excess production in adolescents – <i>acromegaly</i> with large limbs and lower jaw</p>
2	Thyrotropic or Thyroid stimulating hormone (TSH)	2. It stimulates the growth of thyroid gland and produces thyroxine.

39.Copy the diagram and label the parts with the help of the clues given:

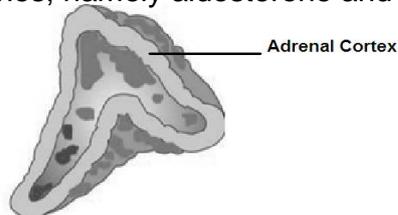
i) It is otherwise called supra renal gland. ii) It secretes two hormones, namely aldosterone and cortisone.



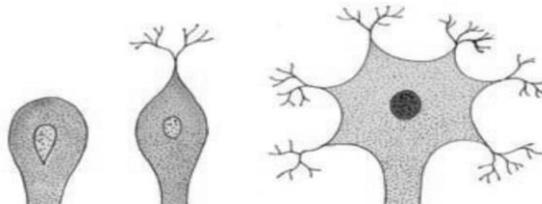
Ans : i) It is otherwise called supra renal gland – **ADRENAL GLAND**



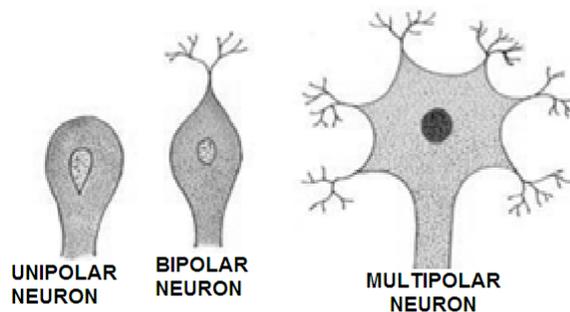
ii) It secretes two hormones, namely aldosterone and cortisone – **ADRENAL CORTEX**



40. Copy and identify the types of neurons given below:



Ans :



41. Here are some statements about meiosis. State whether each of them is true or false:

- i) It takes place in somatic cells. ii) Meiosis is also called reduction division.
- iii) Pairing of homologous chromosomes is called crossing over.
- iv) Meiosis leads to variations which form the raw material for evolution.

Ans : i) It takes place in somatic cells. – **FALSE**

Corrected statement : It takes place in **Germinal Epithelial** cells.

ii) Meiosis is also called reduction division. - **TRUE**

iii) Pairing of homologous chromosomes is called crossing over. – **FALSE**

Corrected statement : Pairing of homologous chromosomes is called **Synapsis**

iv) Meiosis leads to variations which form the raw material for evolution. - **TRUE**

42. Match the following:

A. leptotene	I. nuclear membrane and nucleolus disappear
B. zygotene	II. terminalization
C. diplotene	III. pairing, synapsis, bivalents
D. diakinesis	IV. chromosomes condense and appear like threads

Ans :

A. leptotene	I. chromosomes condense and appear like threads
B. zygotene	II. pairing, synapsis, bivalents
C. diplotene	III. terminalization
D. diakinesis	IV. nuclear membrane and nucleolus disappear

43. A person was riding a two-wheeler without wearing a helmet. He met with an accident and sustained a head injury. He was dead before he was shifted to the hospital and it was found that his death was due to breathlessness and heart failure. Which part of his brain might have been damaged? Justify your answer.

Ans : **Medulla oblongata** has been damaged.

Reason : Medulla is the posterior most part of the brain where it merges with the spinal cord. It acts as a coordination pathway for both ascending and descending nerve tracts. Medulla is the centre for several reflexes involved in the regulation of heart beat, blood vessel contraction, breathing, etc.

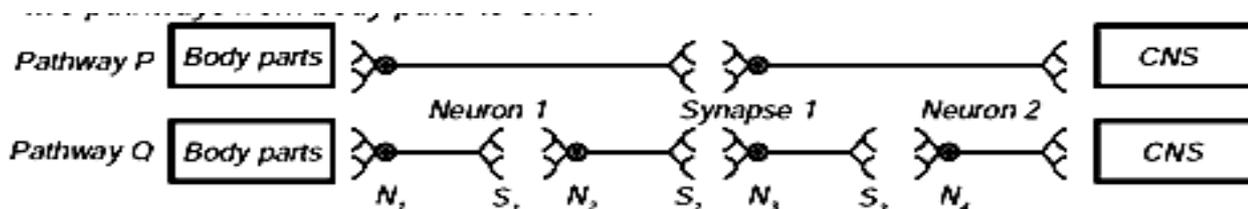
44. Match the following:

List I	List II
A. Vasopressin	I. Resist infection
B. Insulin	II. Diabetes insipidus
C. Oxytocin	III. Diabetes mellitus
D. Thymosin	IV. contraction and relaxation of uterus

Ans :

List I	List II
A. Vasopressin	I. Diabetes insipidus
B. Insulin	II. Diabetes mellitus
C. Oxytocin	III. Contraction and relaxation of uterus
D. Thymosin	IV. Resist infection

45. Observe the following diagrams that depict the transmission of nerve impulses through two pathways from body parts to CNS:



If all the nerves at both the places are similar in thickness and structure, through which pathway will the transmission of an impulse (of same threshold) be faster and why?

Ans : **Pathway P** transmits impulses faster than Pathway Q.

Because the transmission of impulses depends upon the number of synapse. As Pathway P has lesser number (one) of synapse, the transmission would be faster than Pathway Q which has 3 synapses.

46. Which gland is called the 'dual gland'? Why?

Ans : **Pancreas** is called as the dual gland.

Reason : Pancreas plays a dual role both as an **Exocrine (Produces enzyme)** and an **Endocrine gland (Produces Hormone)**.

47. A 16 year old boy was brought to a doctor with a complaint of non-masculine features (lack of moustache / beard / gruff voice / broadening of shoulders etc). After keen examination, the doctor found that it was a hormonal disorder and the endocrine glands responsible were not functioning properly. Mention the glands and the hormone lacking in the boy.

Ans :

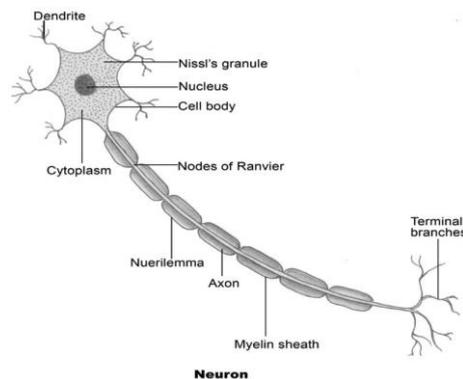
The endocrine gland is **Testes**

The hormone is **Testosterone**

PART - C

48. Describe the structure of a neuron with the help of a neat, labelled diagram,

Ans : **The structure of a neuron** :



Nerve cells or neurons are the structural and functional units of the nervous system. The Human Brain is made up of about 86 billion neurons and many more neuroglial cells (more than 86 billion). A nerve cell is a microscopic structure consisting of three major parts namely, cell body, dendrites and axon.

I. Cell body

The cell structure is irregular in shape or polyhedral. It is also called cyton. Cell body contains cytoplasm with typical cell organelles and certain granular bodies called Nissle's granules. Nissle's granules are a group of ribosomes for protein synthesis.

II. Dendrites

Dendrites or Dendrons are short fibres which branch repeatedly and protrude out of the cell body. Dendrites transmit electrical impulses towards the cyton.

III. Axon

One of the fibres arising from the cell body is very long with a branched distal end and it is called Axon. The distal branch of the axon terminates in bulb-like structures called synaptic knob filled with chemicals called neuro transmitters. The cytoplasm of the axon is known as axoplasm. The axon which is covered by a myelin sheath is formed of many layers of Schwann cells. The outermost layer of Schwann cells is called Neurilemma. The gaps left by the myelin sheath are called Nodes of Ranvier. Neurilemma is discontinuous at Nodes of Ranvier. The myelin sheath ensures rapid transmission of electric impulses.

49. List out the various parts of the human brain and write a note on their functions.

Ans : The brain is the central information processing organ and acts as the command and control system.

The human brain as in the case of other vertebrates, is divided into three major parts:

- a) Forebrain
- b) Midbrain
- c) Hindbrain

a. Forebrain

The forebrain consists of

1. Cerebrum,
2. Thalamus and
3. Hypothalamus.

Functions of Cerebrum

Cerebrum is the seat of consciousness, intelligence, memory, imagination and reasoning. It receives impulses from different parts of the body and initiates voluntary activities. Specific areas of cerebrum are associated with specific functions. Thus there is a respective centre for hearing, seeing, tasting, smelling, speaking and so on. A damage in a specific centre of the cerebrum will deprive the particular part from carrying out its functions.

Functions of Thalamus

The cerebrum wraps around a structure called thalamus – a major conducting centre for sensory and motor signaling.

Functions of Hypothalamus

It lies at the base of the thalamus. It controls body temperature, urge to eat and drink, the regulation of sexual behavior and expresses emotional reactions like excitement, anger, fear, pleasure and motivation.

b. Midbrain

The midbrain is located between the thalamus and the hindbrain. A canal called **cerebral aqueduct** passes through the midbrain. The dorsal portion of the midbrain consists of four hemispherical bodies called **corpora quadrigemina** which controls and regulates various visual reflexes and optical orientation.

c. Hindbrain

The hindbrain comprises

1. Cerebellum,
2. Pons and
3. Medulla oblongata.

Functions of Cerebellum

Cerebellum regulates and coordinates the group movements of voluntary muscles as in walking or running.

Functions of Pons

It is the bridge of nerve fibres that connects the lobes of the cerebellum. It relays the information from the cerebrum to the cerebellum. It also contains the sleep and respiratory centres.

Functions of Medulla oblongata

Medulla is the posterior most part of the brain where it merges with the spinal cord. It acts as a coordination pathway for both ascending and descending nerve tracts. Medulla is the centre for several reflexes involved in the regulation of heart beat, blood vessel contraction, breathing, etc.

50. Name the endocrine glands and their location in the human body. Describe any two of them in detail.

Ans : **Endocrine Glands and their location**

No.	Endocrine Gland	Location
1.	Pituitary Gland	It is attached to the hypothalamus of the brain
2.	Pineal gland	It lies under the corpus callosum in the brain.
3.	Thyroid gland	It is located on the either side of larynx. (Neck)
4.	Parathyroid gland	These are found within the thyroid.
5.	Thymus gland	It is a lymphoid mass, present above the heart.
6.	Pancreas – Islets of Langerhans	In the abdomen, below the stomach.
7.	Adrenal gland	It is present on top of each kidney.
8.	Testes	They are contained in scrotal sac.
9.	Ovaries	They are present on either side of uterus.

I. The Islets of Langerhans

Pancreas plays a dual role both as an exocrine and an endocrine gland. The an endocrine portion is called **Islets of Langerhans**. It consists of two types of cells namely, alpha cells and beta cells. **Alpha cells** produce a hormone called **glucagon** and **Beta cells** produce **insulin**.

A. Insulin

1. It promotes the uptake of glucose by the cells for tissue oxidation.
2. It favours conversion of glucose into glycogen and its storage in the liver and the muscles.
3. It prevents the formation of glucose from protein and fat.

Diabetes Mellitus

Less production of insulin causes Diabetes mellitus, in which the excess, unused glucose is excreted in the urine.

B.Glucagon

1. It is secreted when the glucose level in the blood is low.
2. It influences conversion of glycogen into glucose, thus raising the blood glucose level.
3. A proper balance between insulin and glucagon is necessary to maintain proper blood glucose level of 80 – 120 mg / dl of blood.

II.Testes

They are both cytogenic (producing gametes) and endocrine (producing male sex hormones) in function. Leydig cells constitute the endocrine part of the testes. It secretes male sex hormone called *testosterone* (*androgen*).

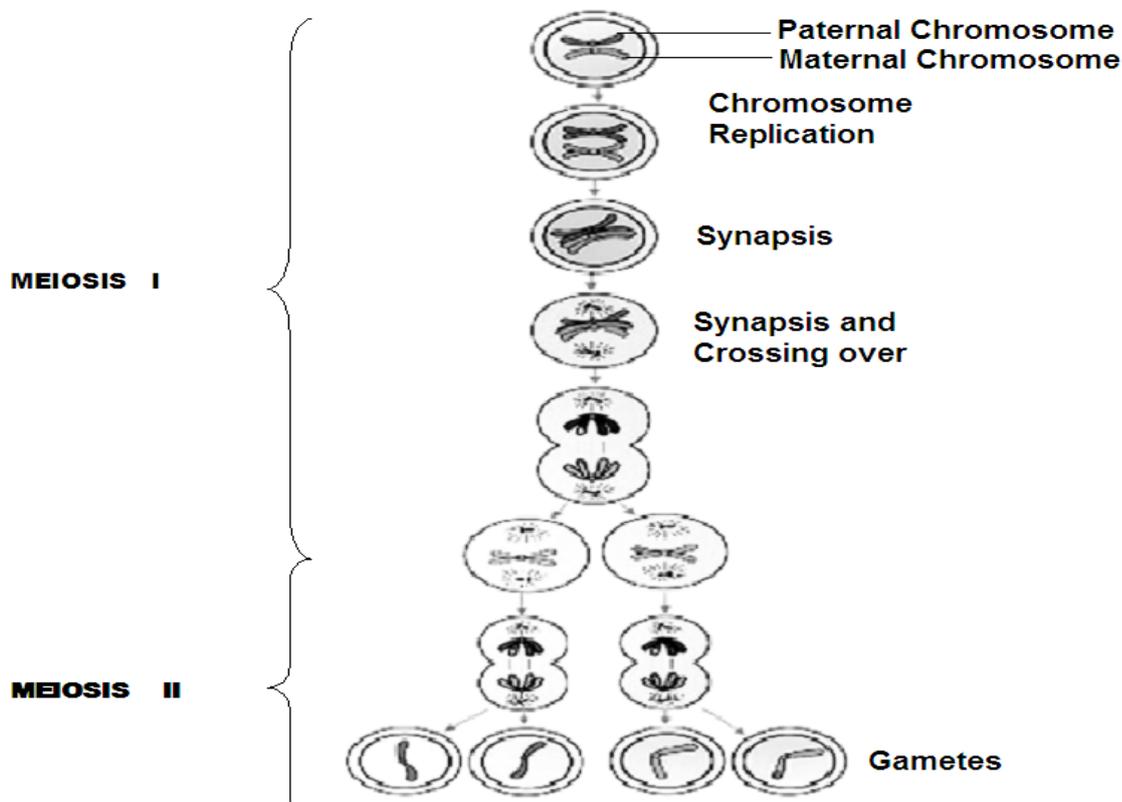
Functions of testosterone (androgen).

1. Testosterone stimulates the growth of reproductive organs and the production of male gametes- the sperm.
2. Testosterone determines the secondary sexual characters in male, such as growth of facial hair, hoarse voice, broadening of shoulder, etc.

51. Why is meiosis called reduction division? Describe the various stages with relevant diagrams. Add a note on significance of meiosis.

Ans : I. **Meiosis** is called **reduction division** because it reduces the number of chromosomes from 46 chromosomes or 2n(**Diploid**) to 23 chromosomes or n (**Haploid** or single chromosome set).

II.Various Stages of Meiosis :Meiosis is completed in two successive divisions – **Meiosis-I** and **Meiosis-II**.



Meiosis – I The various events of Meiosis-I are studied under **four sub-stages** namely

- Prophase-I,
- Metaphase-I,
- Anaphase-I and
- Telophase-I.

Prophase I this stage is studied under **five sub-divisions** as

1.Leptotene : The chromosomes condense and appear like threads. Each chromosome splits up longitudinally, except at the centromere.

2.Zygotene: The homologous chromosomes come closer and start **pairing**. The pairing starts from the tip or from the middle and they get attached laterally throughout the length. This pairing is called **Synapsis** and the paired chromosomes are called **Bivalents**.

3.Pachytene: The paired chromosomes become shorter and thicker. Each bivalent appears to have four chromatids called **tetrads** or **quadrivalents**. The point of contact between the homologous pair of chromosomes is called **Chiasmata**. At the point of chiasmata, exchange of chromosomal segment takes place, between the non-sister chromatids of the homologous pairs. This exchange of segments of chromatids between homologous chromosomes is called **crossing over**.

4.Diplotene : After the crossing over is completed, the homologous chromosomes separate and this separation is called **terminalization**. Terminalization may begin in chiasmata and move to the terminal end of the chromosomes.

5.Diakinesis The nuclear membrane and the nucleolus disappear. The spindle apparatus is formed in the cytoplasm.

Metaphase – I The chromosomes get condensed. Bivalents now appear on the equator of the spindle with their chromatids pointing towards the equatorial plate and the centromere pointing towards the poles.

Anaphase – I The spindle fibres contract pulling the chromosomes towards the opposite poles. The entire chromosome, with two chromatids move to the opposite poles. This involves a reduction in the number of chromosomes. Now two groups of chromosomes are produced, one at each pole with half the number of chromosomes.

Telophase – I At the poles, around the group of chromosomes, a nuclear membrane develops. Thus two daughter nuclei each with half the number of chromosomes, are formed at the poles. The spindle fibres disappear. At the end of Meiosis-I at right angle to the position of the nuclei, the cytoplasmic constriction takes place leading to the division of the cell. The cytoplasmic division is called Cytokinesis.

Meiosis - II

Meiosis-II is similar to Mitosis and so it is called Meiotic Mitosis. The events of Meiosis-II are studied in four sub-divisions as: Prophase-II, Metaphase-II, Anaphase-II and Telophase-II.

Prophase - II

The bivalent chromosomes get shortened. The centrioles form asters and move to the poles. The nucleolus and the nuclear membrane disappear.

Metaphase - II

Chromatids arrange themselves in the equator of the cell. The centromeres are attached to the spindle fibres.

Anaphase - II

The centromere divides into two and the two chromatids separate and now, they are called daughter chromosomes or new chromosomes. The daughter chromosomes move towards the opposite poles.

Telophase - II

The haploid set at the two poles coil to form chromatin material. The nuclear membrane and the nucleolus reappear. Thus two daughter nuclei are formed.

Cytokinesis

The cytoplasmic division takes place at right angles to the position of the nuclei ,resulting in the formation of four gametes.

III. Significance of Meiosis

1. Haploid sex cells are produced in order to maintain constancy in the number of chromosomes of a species.
2. Crossing over results in variation of genetic traits in the offspring.
3. Variations form the raw material for evolution.

52. Use words from the given list to complete the following paragraph. (The words may be used once/ more than once / not at all).

(Skull, Vertebral column, Pia mater, Arachnoid membrane, Brain, Spinal cord, Meninges, Duramater)

The central nervous system is covered by three protective coverings collectively called _____. The outermost cover lying below the _____ and _____ is double thick and is called _____. The middle covering is thin and vascularised and is called _____. The innermost cover is a very thin delicate membrane and is closely stretched over the outer surface of _____ and _____ and is called _____.

Ans :

The central nervous system is covered by three protective coverings collectively called **Meninges**. The outermost cover lying below the **Skull** and **Vertebral column** is double thick and is called **Duramater**. The middle covering is thin and vascularised and is called **Arachnoid membrane**. The innermost cover is a very thin delicate membrane and is closely stretched over the outer surface of **Brain** and **Spinal cord** and is called **Pia mater**.

53. Match these parts with their functions:-

(medulla oblongata, cerebellum, forebrain, thalamus, cerebral cortex, hind brain, pons, hypothalamus)

- a) Sleep centre and respiratory centre
- b) Several reflexes involved in the regulation of heart beat, blood vessel contraction, breathing etc.
- c) Consists of cerebrum, thalamus and hypothalamus
- d) Motor and sensory areas
- e) A major conducting centre for sensory and motor signalling
- f) Regulation of sexual behaviour
- g) Consists of pons, cerebellum and medulla oblongata
- h) Co-ordinates the group movements of voluntary muscles, as in walking or running

Ans : a) Sleep centre and respiratory centre - **Pons**

b) Several reflexes involved in the regulation of heart beat, blood vessel contraction, breathing etc. - **Medulla oblongata**

c) Consists of cerebrum, thalamus and hypothalamus - **Forebrain**

d) Motor and sensory areas - **Cerebral cortex**

e) A major conducting centre for sensory and motor signaling - **Thalamus**

f) Regulation of sexual behavior - **Hypothalamus**

g) Consists of pons, cerebellum and medulla oblongata - **Hind brain**

h) Co-ordinates the group movements of voluntary muscles, as in walking or running - **Cerebellum**

54. Observe the diagram of the human brain and identify the areas mentioned:

- i) The area responsible for consciousness, intelligence, memory, imagination and reasoning.
- ii) The area responsible for regulation and co-ordination of group movements of voluntary muscles.
- iii) The area responsible for sleeping and respiration.
- iv) The area responsible for reflexes involved in the regulation of heart beat, blood vessel contraction, breathing etc.

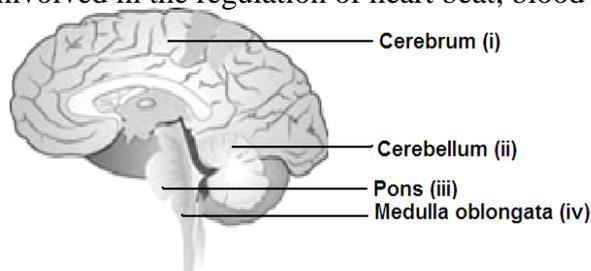


Ans : i) The area responsible for consciousness, intelligence, memory, imagination and reasoning.- **Cerebrum**

ii) The area responsible for regulation and co-ordination of group movements of voluntary muscles.- **Cerebellum**

iii) The area responsible for sleeping and respiration. - **Pons**

iv) The area responsible for reflexes involved in the regulation of heart beat, blood vessel contraction, breathing etc. - **Medulla oblongata**



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