SUBJECTIVE - TYPE

SECTION - 'B'

QUESTION - 2

SHORT ANSWERS:

(i)

ANTIDIURETIC HORMONE

The hormone or chemical which inhibits urine production

FUNCTIONS:

1- ADH increases the permeability of distal convoluted tubules & collecting ducts of nephrons to

reabsorb water from filtrate.
when more water is absorbed, concentrated urine is produced
It also causes blood volume increases & solute concentration decreases.
It also causes contraction of arteries, thus it increase B.P.

FUNCTIONS OF OXYTOCIN

1- Oxytocin causes strong contraction of uterine muscles during birth.
2- Oxytocin also cause contraction of uterine muscles or wall after birth to expel placental remains.
3- It also causes ejection of milk from mammary glands

are sucked by baby called milk ejection reflex.

V

TRASCRIPTION :

DEFINITION :

"The process in which the formation of mRNA from DNA occurs during protein synthesis is called transcription."

TRANSLATION :

DEFINITION :

"The process of the formation of protein with the help of RNAs is called translation".

iv

SEMI CONSERVATIVE MODEL:

Semi conservative model is the most accepted model presented by watson & crick.

EXPLANATION:

↳ According to this model each strand of parental DNA molecule separate or unzipped and each act as tamplate strand for the formation of new strand.

↳ In this way two daughter DNA - molecules is formed with one old and one new strand i.e.

50% conservation of old or parental strand occurs

iii

REASON FOR PEA PLANT SELECTION.

1- The main reasons for the selection of pea plants were as follows:

2- Easy to cultivate & easy handled.

3- Flowers are hermaphrodite (having male & female part)

4- It is normally a self fertilization plant but cross fertilization can be easy made.

5- Time gap between the generation raising is short. pea plant have very sharply distinct trails.

6- Numerous varieties are available.

7- These plants produced a large number of seeds.

8- They have prominant inherited characteristics.

XIII

SYNAPSE:

DEFINITION:

"The neurons are so arranged that there are empty space between them having no cytoplasmic connection between them called synapse".

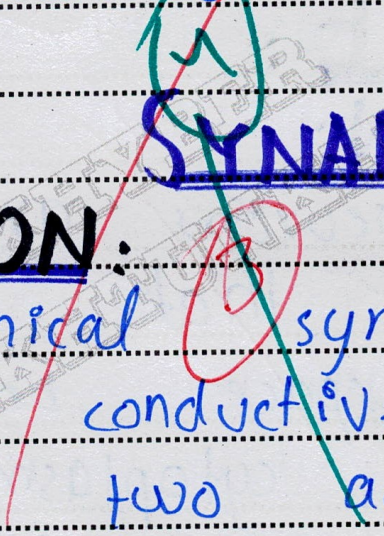
TYPES:

* Electrical synapse * chemical synapse

ELECTRICAL SYNAPSE:

DEFINITION:

"Electrical synapse is a mechanical and electrically conductive link between two adjacent neurons that is formed at a narrow gap between the pre synaptic & post-synaptic neurons is known as electrical synapse"



CHEMICAL SYNAPSE:

DEFINITION:

'Chemical synapses are chemical conductive links between two adjacent neurons in which information of impulse from one neuron is transmitted to another by means of chemical messanger called

neurotransmitters".

VIII

BIOTECHNOLOGY:

DEFINITION:

"The branch of biology which deals with study of use of micro-organism & techniques of biology for the welfare of humanity is called bio technology".

TWO EXAMPLES & ITS IMPORTANCE:

MYCORRHIZA:

This is symbiotic association between fungi and roots of higher plants like-gymnosperms. This association is very beneficial for the

growth of plants. In most of the cases plant seedling fails grow if the soil does not contain inoculum of mycorrhizal fungs.

2- BIOFERTILIZERS.

Biofertilizers are nutrients prepared by biological process for the growth of plants. So those fertillizers which contain biologically fixed nitrogen are called biofertilizer.

X

SKIN AS THEMOREGULATORY ORGAN:

The skin plays a vital role in regulating body temperature.

SWEAT GLANDS:

Sweat glands release sweat, which cools the body through evaporation.

VASO-CONSTRICTION & DIALATION:

Blood vessels in the skin dialate to release heat & constrict to retain heat.

SUBCUTANEOUS FAT:

The fatty layer under the skin acts as insulation, helping to maintain internal temperature.

CONCLUSION:

These functions make skin an effective thermo gulatory organs.

XII

RESTING MEMBRANE POTENTIAL

ACTIVE MEMBRANE PONTENTIAL

(1)	
It is the charge difference across cell membrane in state of rest	It is the rapid up & down shift in membrane voltage
(2)	
In RMP there is no conduction of impulse	In Amp the conduction occurs.
(3)	
It is polarized state	It is non-polarized state
(4)	
In RMP the membrane is more permeable to k^+ ion than Na^+ ion	In AMP the membrane is more permeable to Na^+ ion than k^+ ion

ix

TRUE RIBS:

Those ribs which are directly connected with sternum are called true ribs.

PAIRS:

These are 7 pairs in number.

FALSE RIBS:

Those ribs which are not directly connected with sternum but are indirectly attached through intercostal arch, are known as false ribs.

PAIRS:

These are 3 pairs in number.

FLOATING RIBS.

Those ribs which are free and are not attached with sternum are known as floating ribs.

PAIRS:

These are 2-pairs of floating ribs.

VI

ENDOSYMBIOSIS:

↳ This hypothesis was given by Lynn Margulis.

↳ According to him two separate mutually beneficial invasion of prokaryotic cell produced the

modern day mitochondria and chloroplast - as eukaryotic organelle -

↳ Ancestral mitochondria were small heterotrophes that uses oxygen to perform cellular respiration & create energy -

↳ This mitochondria become a part of large cell either by direct invasion as an internal parasite or as an indigestible food source -

↳ Later on a second invasion brought ancestral chloroplast, which are thought to be small photo auto-trophes.

SECTION- C

LONG ANSWERS

QUESTION- 5

AXIAL SKELETON:

The skeleton which lies in the centre or mid line of the body is called axial skeleton.

COMPOSITION

It is composed of skull vertebral coloum & ribs.

SKULL:

The skull is composed of cranium, face, ear bone & hyoid bone.

The primary function of skull is the protection of brain.

COMPOSITION

It is composed of 22 bones besides 6 tiny bones of ears & one hyoid bone.

SKULL	UNPAIRED BONE	PAIRED BONE
Cranium bone (8)	Frontal Occipital Sphenoid Ethmoid	Parietal Temporal
Facial bone (14)	Mandible Vomer	Maxila Zygomatic Lacrimal Nasal Palatine Inferior-conche
Ear bone (6)		Malles Incus Stapes

NECK BONE (HYOID BONE)

↳ It is a slender 'U' shaped bone between the chin & larynx.

↳ It is a single bone which do not articulate with other bone.

↳ This bone serves for the attachment of several muscle that control mandible, tongue & larynx.

VERTEBRAL COLOUM.

↳ It is a rigid rod on the dorsal side of the trunk forming back

Bone.

↳ It extends from the skull to the pelvis

↳ It houses & protect spinal cord.

↳ It is a place of attachment of pelvic & pectoral girdle.

↳ In human being it contains 33 vertebral i.e

- Cervical = 7
- Thoracic = 12
- Lumber = 5
- Sacrum = 5
- Coccyx = 4

RIBS:

It forms ribcage which protects the lungs & heart.

In human there are 12 pairs of ribs

TRUE RIBS:

These ribs are directly attached with sternum.

These are seven pair in number.

FALSE RIBS:

These ribs are not directly attached with sternum.

They are two pair in number

FLOATING RIBS:

These ribs are free & do not attached with sternum

They are two pair in number.

APPENDICULAR SKELETON:

The skeleton which lies at the lateral sides of the body is called appendicular skeleton.

PARTS: It is composed of pectorial girdle with fore limb & Pelvic girdle with hind limbs.

PECTORIAL GIRDLE:

It is present in shoulder region. they connect fore limb with main body.

It is composed of the following bones.

- Clavical
- Scapula

FORE LIMB:

It consist of the following bones

- Humerus = 1
- Ulna = 1
- Radius = 1

- Carpals = 8
- Metacarpals = 5
- phalanges = 14

PELVIC GIRDLE:

↳ It attaches hind limb with the main body

↳ It contains two coxal (hip) bone.

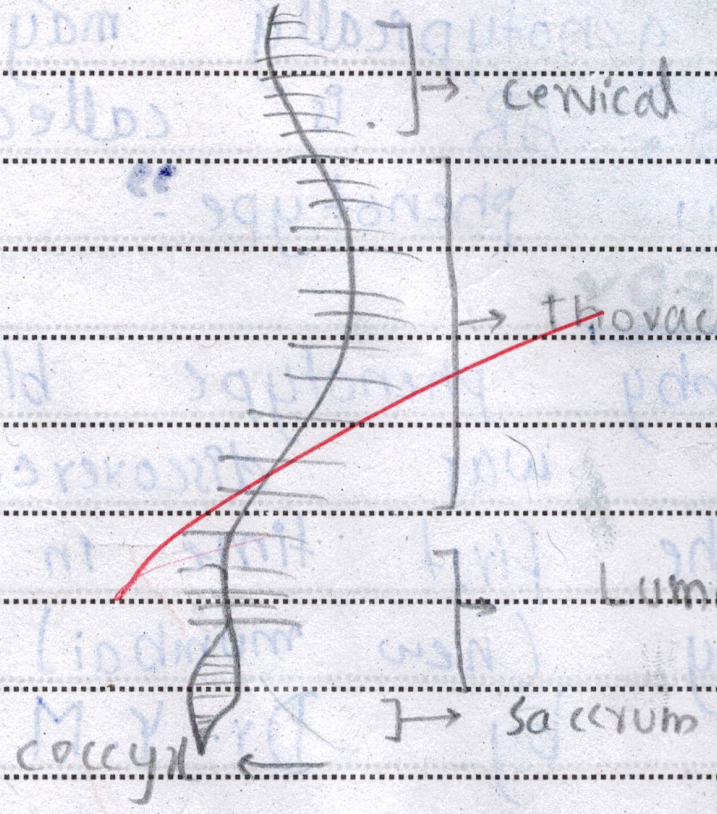
↳ Each coxal bone is made by the combination of 3 bone i.e.
ischium, illium, & Pubis.

HIND LIMB:

It consists the following bones

- Femur = 1
- Patella = 1
- Tibia = 1
- Fibula = 1
- Tarsals = 7
- Metatarsals = 5

Phalanges = 14



QUESTION # 4

(a) 5+4=9

BOMBY PHENOTYPE AS EXAMPLE OF EPISTASIS:

DEFINITION:

"A rare type of blood group

which is phenotypically "O" but genotypically may be A, B, AB is called Bombay phenotype."

DISCOVERY:

Bomby phenotype blood group was discovered for the first time in Bomby (new mumbai) in 1952 by Dr. Y.M. Bhende

RATIO OF BOMBY PHENO-TYPE:

Generally, the percentage of people with Bomby phenotype in the world is 0.0004% and 0.01% in mumbai local population.

JUSTIFICATION:

1- The expression of ABO blood group which is

BM 47

produced by gene- I^A, I^B, i, depends upon the presence of another gene- 'H'. is called non-allelic interaction because ABO blood group gene is present on chromosome no. 9 while gene-H is present on chromosom NO-19.

2- the gene-H produces substance-H while gene I^A produces enzyme-A, which modifies the substance H into antigen-A e displaying at RBC's surface, as a result phenotypically the blood group will be A.

3- Similarly, the gene- I^B produce

enzyme - B which modifies the substance - H (produce by gene - H) and displaying at RBCs surface as a result phenotypically the blood group will be 'B'. Similarly for blood group 'AB' are also conducted.

4- But remember that substance H- is produced by dominant H allele with homozygous (HH) is produced by dominant genotypes & can't be produced by homozygous recessive (hh).

5- So if a person is homozygous recessive for gene H then they will not form substance H and antigen A, B can't be displayed at RBCs

Surface, as a result the person phenotypically be exhibiting blood group 'O'

(b)

APPLICATION OF PCR.

1- PCR is used for the detection of specific infectious agents e.g HBV, HCV, HIV.

2- It is used for the detection of microbes in food & water

3- It is used for genome analysis & for generating markers for the construction of genetic & physical maps

of organisms.

4- Reaction for DNA sequencing are also simplified by introducing PCR method.

5- There is a PCR-based CDNA transcriptase PCR, which cab be directly carried out with purified mRNA.

6- PCR helps to find out crimes from DNA testing.

QUESTION-3

TRANSLATION PHASE OF GENE EXPRE

B57

SSION

DEFINITION:

The process of the formation of protein with the help of RNA, is called translation

EXPLANATION:

In translation the mRNA which produced by transcription is decoded by the ribosome to produce a specific amino acid chain that will later fold into an active protein

SECOND PHASE OE GENE EXPRESSION

Translation is the second phase in gene expression. The information stored in mRNA is translated into protein with the help of RNAs & ribsomes.

STEP OF TRANSLATION

The process of translation complete in 4 phase's as following.

ACTIVATION OF AMINO-ACID:

Amino acids are present in inactive form in cytoplasm. Amino -acid are first activated by ATP inside the cytoplasm in order to make bonds with t-RNA. various amino acids that are to to take part in polypeptide formation.

2- FORMATION OF INITIATION COMPLEX:

↳ Actually the process of translation begins with the formation of initiation complex.

↳ Ribosomal subunit, mRNA & aminocyl tRNA complex combine to form the initiation complex.

↳ First a tRNA molecule carry a modified methoonin bind to smalled ribosomal unit.

↳ At the same time 5' end of mRNA molecule also binds to the ribosome with the help of another initiation factor

3- POLY PEPTIDE ELONGATION

↳ In this phase ribosomal unit move along mRNA amino acids are brought by t RNA towards which join togather to form a poly peptide chain.

↳ This process is completed in three steps which are repeated again & again i.e.

STEP # 1

The exposed A side codon recieve amiocycte t,RNA complex & combine togather with the help of an enzyme called elongation factor.

STEP # 2:

Then an enzyme peptidyle transferase is emerged frome p- site which

BSM WFD

removes the amino acid by peptid bond.

STEP # 3:

Translocation i.e the riboso-mal sub unit is slightly moves along RNA from 5'- 3' direction so the new codon is exposed at at A site.

↳ Due to this the empty tRNA is reached at E site to leave the ribosome

↳ These three steps repeated again & again until the stop codon is reached at A site.

TERMINATION:

polypeptide elongation is continued until a chain terminating non-sense (stop) codon is exposed at A-site ∴ non-sense (stop) codons do not bind to any t-RNA but all 3 - termination (stop) codons (i.e - UAG, UGA, UAA) are recognized by release factor and terminates the translation process

7+0=8