Ans-1 (a)

(iii) Embryo sac

(b)

(ii) (FSH) and (LH)

(c)

(iii) f_2

(d)

(ii) Conjugation

(e)

(i) IgA

(f)

(iv) to overcome the deficiency of ADA

(g)

(iv) 5

(h)

(iv) they turn invasive and cause the decline or extinction of indigenous

(i)

(ii) Both (A) & (R) are correct by (R) is not the correct explanation of (A)

(j)

(i) Both A & R correct & (R) Correct explanation of (A)

Ans ⇒ 2

Male Reproductive system located in the "Pelvic region" extra abdomenally.

Ans ⇒ 3

"Test Cross"

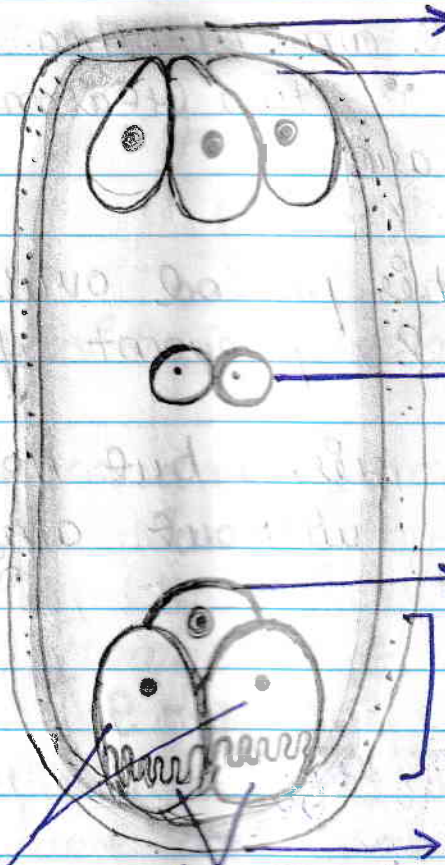
Ans ⇒ 4

Holes in "Swiss Cheese" due to release of 'CO_2' gas

Ans 5

"Genetic Engineering Appraisal Committee"

Ans-6



- 8 Nucleate Matwe Embryo sac

Ans -7

Location of Mitochondria in Sperm

→ It is found in the middle piece of the sperm.

Function : Mitochondria provides Energy to the sperm to facilitate the sperm motility & fertilizing power.

Ans - 8

" Lactational amenorrhea is a contraceptive method " two reasons to support this are

i) During this period ovulation does not occur & prevent from pregnancy.

(ii) It is yet risky but helps in contraception naturally without any harmful effects.

Ans - 9

(i)

Genotype of carrier Sickle cell Anemia is $Hb^S Hb$

(ii)

Sickle cell anemia Affected genotype is $Hb^S Hb^S$

Ans - 10

i) Natural Selection → Charles Darwin

(ii) Inheritance of acquired Characters → Long neck of Giraffe

iii) Analogous structure → Convergent evolution

iv) Industrial melanism → Dark winged & White winged

Ans 11

Lactic acid Bacteria (LAB) ⇒ This bacteria produces lactic acid which help us in many ways :

Some Benefits :

(i) This helps in V-B12 providing nutrition to us and maintains body functioning

(ii) These bacteria present in our body helps in inhibiting the growth of other harmful microbes.

(iii) This also maintains the P.H level in our stomach for proper functioning

Ans ⇒ 12

In 'Eco', 'R' and 'I' represent in Enzyme EcoRI is :

'E Co' = It represents genus & species of 'Escherichia Coli'

'R' represents ⇒ 'Strain'

'I' represents ⇒ 'Order number'

Ans - 13

Role of UV light and ethidium Bromide during gel electrophoresis :-

- The fragment of DNA in gel electrophoresis 'stained' due to the Ethidium bromide application.
- After staining when it visualized under U.V light it shows 'Orange' colour.
- After this we can extract our desired DNA fragment with desirable genes called 'Elution'.

Ans = 14

Cry gene ⇒ Cry gene are the genes obtained from the 'bacillus thuringensis' which is used to kill certain types of other insects.

It have different types :-

Ex - Cry I Ab and Cry II Ab

function of Cry IAb → It helps to kill the ~~cotton bollworm~~. "Corn borer".

function of Cry II Ab →

It helps in killing the "Cotton bollworm"

This technique helps in the making of "Pest Resistant plant" under (GMO) Genetically modified Organism.

Ans -15 (i)

The effect on decomposition rate :

(i) Detritus is rich in lignin and chitin Decomposition "slows down".

(ii) Detritus is rich in Nitrogen and sugar Decomposition rate becomes "faster"

Decomposition is a process in which Detritivores like (earthworm) breakdown the complex organic molecules into simpler ones like (CO_2, minerals). whose rates depends

upon varies factors :-

(i) Chemical composition of organic substar
(ii) Temperature
(iii) Moisture.

Decomposition is a oxygen requiring process & needs (aerobic) microorganism for decomposition.

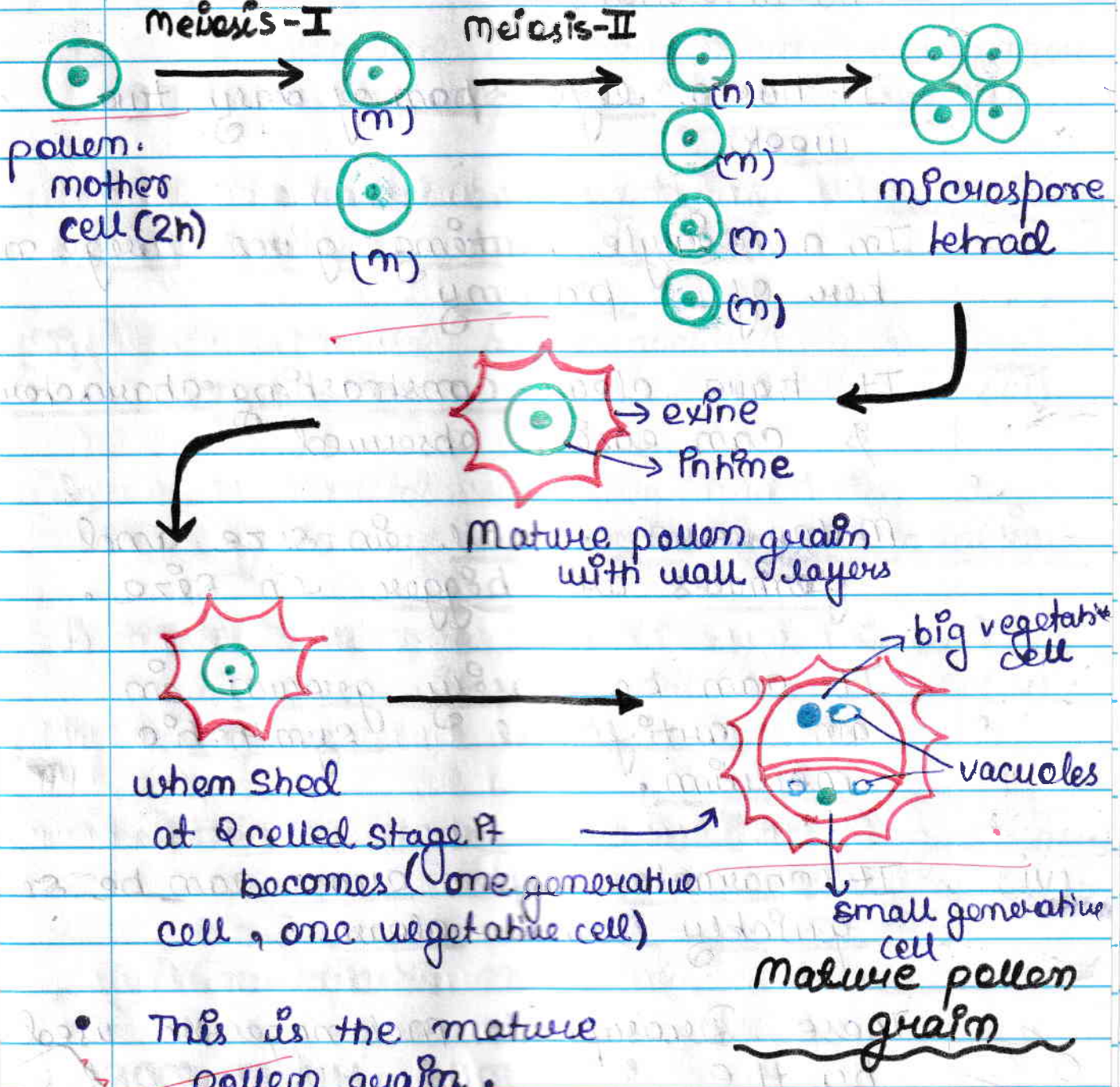
Ans ⇒ 16

Development of pollen grains from pollen mother cell

Development of pollen grain from pollen mother cell (Microspore mother cell) (MMC) goes through various stages.

- firstly microspore mother cell undergoes first meiotic division (reduction) and form two haploid microspore.
- Meiosis-II is takes places further form four microspores each genetically identical & meiosis completes.
- They arranged themselves in microspore tetrad

- They all are functional & dehydrates & develops outer hard layer exine made of (sporopollenin) and inner (cellulose & pectin) & become mature pollen grain.



- This is the mature pollen grain.

Ans -17

Drosophila melanogaster (fruit fly) used extensively for genetic study because of its several characteristics.

(i) It has a life span of only two weeks.

(ii) In a single mating gives large number of progeny.

(iii) It have clear constrasting character & can easily observed

(iv) Males are small in size and females are bigger in size.

(v) It can be easily grown on an artificial synthetic medium.

(vi) It characters after cross can be seen quickly and clear.

These Drosophila melanogaster used by the 'THOMUS HUNT MORGAN' for his experiment.

Ans 18

These are some criteria of molecule so that can act as genit genetic material.

(i) It should able to form or regenerate its replica (Replication).

(ii) It should be physically & chemically stable.

(iii) It should undergoes through slow mutation.

(iv) It should expresses itself in the form of Mendelian Character

these are the criteria of molecules so that it can act as genetic material.

• "DNA" (Deoxyribonucleic acid) generally follows all these criteria & aspects and is the 'Best' 'Genetical material' to store Information also.

Ans 20

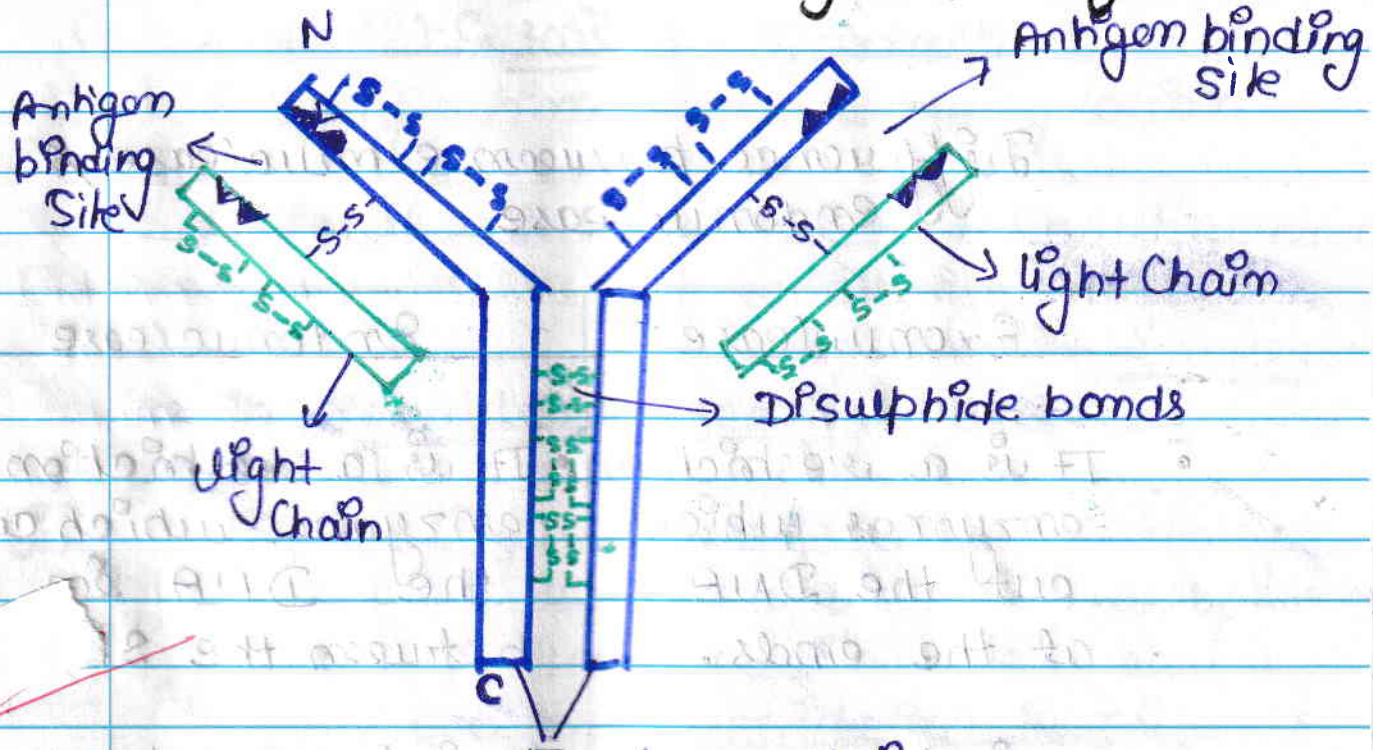
Antibody ⇒ Antibodies are the army of protein which help in fighting against the foreign antigen.

Structure of Antibody Molecule.

- An antibody molecules have two heavy and two light chains.
- An antibody have antigen binding site.
- Antibody molecules have 'N' and 'C' terminal.
- It has total 16 disulphide bond.
- two heavy chain bonded by 2 disulphide bond
- there are 2 bonds between heavy and small chains.

Antibody protects us by making defense and barrier on foreign molecule in several ways.

Structure of Antibody



Ans -19 (i)

In Africa & Asia forests Australia.

Ans (ii)

1400 cc to 1500 cc

Ans (iii)

Neanderthal man shows more advantages with better tools & food making.

Ans 21

Difference between exonuclease & endonuclease

Exonuclease	Endonuclease
• It is a restriction enzymes which cut the DNA at the ends.	• It is a restriction enzymes which cut the DNA in between the strand.
• It is known by the molecular scissor	It is known by the molecular scissor in different manner.
• It breaks down the phosphodiester bond between the strands & heads & repairing of DNA strand ex: Re.CBCD	It plays important Role in genetic engineering & repairing. E. CoRI

Ans 22

Basic processes that cause population density to fluctuate in a given habitat are :-

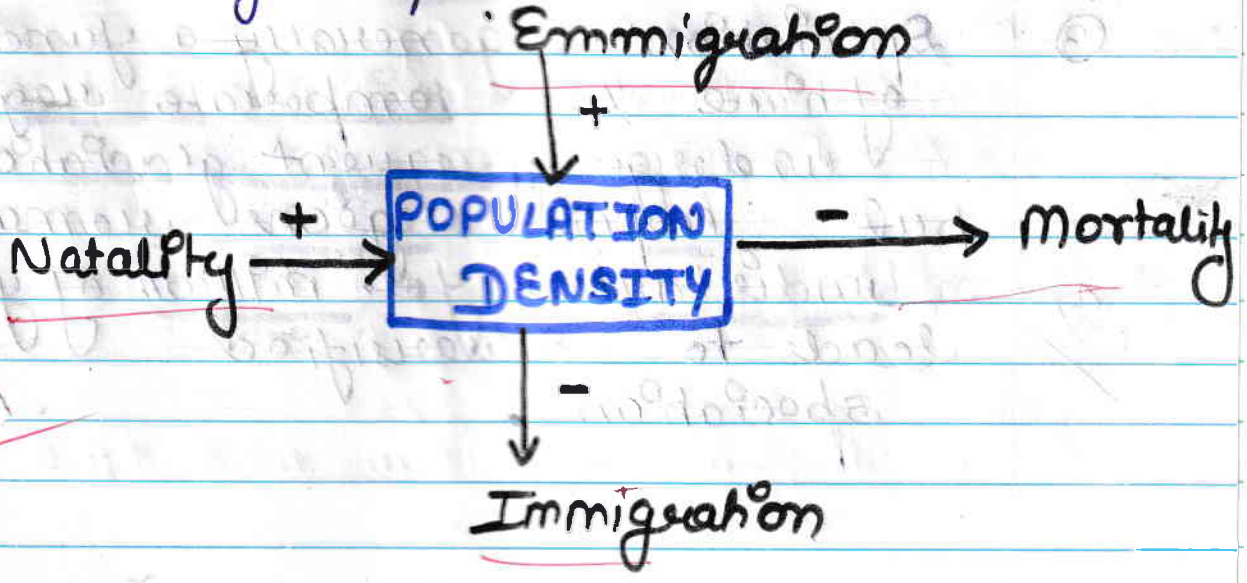
(i) Natality (ii) Mortality
(iii) Emmigration (iv) Immigration

(i) **Natality :** When the rate of Increase in birth of child per capita it Increase the population density.

(ii) **Mortality :** The rate of death of peoples in a population per capita Increase it decrease the population Density

(iii) **Emmigration :** When some population migrated & comes in the habitat population Increases there leads to population density Increase in a given period

(iv) **Immigration :** When some population migrate out from a place there population density decreases in a given period.



Ans 23

Latitudinal gradient ⇒ It is a type of species Area relationship.

In which resources are limited In which species riches decreases after sometime

Diversity in between tropic & temperate region -

① Tropic region have better solar energy than temperate ones leads to higher productivity

② tropic are less seasonal and leads to less change in the environment & leads to slow mutation.

③ Speciation is generally a function of time & temperate regions undergo frequent glaciation, but tropic regions remains undisturbed for million of years leads to diversified speciation.

Que 24

Double fertilization ⇒ When one male gametes fuses with egg cell completes syngamy and another male gamete fuses with ~~diploid~~ ~~in~~ ~~pair~~ polar nuclei of diploid(2n) complies triple fusion form 3n triploid Endosperm nucleus & further cell. this process is called double fertilization.

i) Syngamy
ii) triple fusion] Double fertilization

- Occurs only in Angiospermic plants

Changes after Double fertilization

- Syngamy results zygote which develops to Seed
- triple fusion results in PEN Primary endosperm nucleus

helps in providing Nutrition to the Seed

Dec 25

Double helix structure of DNA is given by James Watson and Francis Crick in 1953.

Salient features of double helix DNA structure.

(i) DNA is double stranded long polymer of nucleotide chain.

(ii) DNA Chain have antiparallel polarity means if one strand is 5' → 3' then another is 3' → 5'

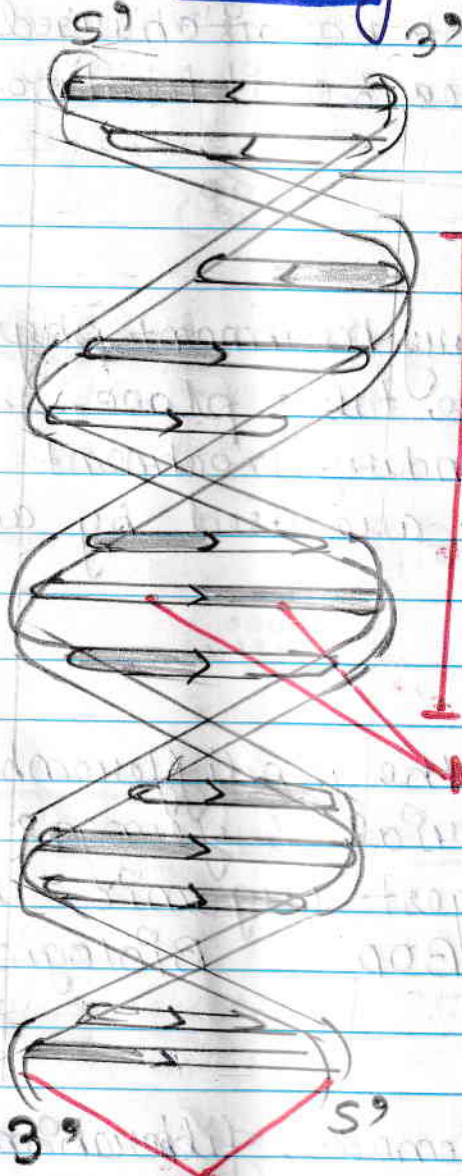
(iii) Phosphate and Sugar form backbone of the chain and have 'N' base.

(iv) The DNA have Nitrogenous base joined to each other by "Hydrogen bond". Purines (A, G) (Adenine, Guanine) always comes opposite to pyrimides (C, U, T) (Cytosine, Uracil, Thymine) (A = T), (G ≡ C)

(v) DNA helix called as Right handed fashion.

(vi) pitch of helix 3.4 nm and have 10 bp (base pairs)

- distance between two base is 0.34 nm.
- one stack of the base is over the another maintains stability.



Double helix DNA Chain

Q: 26 (i)

Sewage contains large amount of organic matter & microbes which are pathogenic & cannot be discharged in natural water bodies so its treatment necessary.

(ii)

In primary treatment physical removals of sewage takes place.
In Secondary treatment Biological treatment are used by aerobic microbes

(iii)

(Flocs) is the undifferentiated mass of bacterial & fungal associations.
Role: digest organic matter & decreases (BOD) Biological Oxygen demand

(iv)

by Sequencial filteration & Sedimentation small and large particles are physically removed from sewage in primary treatment.