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**2013**

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## Section: A

### Question: 1

Name an organism where cell division is itself is a mode of reproduction?

[1]

#### Answer:

Cell division among amoeba, act as mode of reproduction.

### Question: 2

When does a human body elicit an anamnestic response?

[1]

#### Answer:

Human body tends to generate anamnestic response when there is subsequent infection caused by a pathogen, or it may be called as secondary response.

### Question: 3

Name any two diseases the Himgiri variety of wheat is resistant.

[1]

#### Answer:

Two diseases the Himgiri variety of wheat is resistant are,

- Leaf and stripe rust.
- Hill bunt.

### Question: 4

State the role of transposons in silencing of mRNA in eukaryotic cells?

[1]

#### Answer:

Silencing of a gene is done in order to prevent translation of mRNA, where transposons act as a complementary RNA that is used to stop translation.

### Question: 5

Why are green algae not likely to be found in the deepest strata of the ocean?

[1]

#### Answer:

Survival of green algae depends upon,

- Presence of sufficient light for photosynthesis.
- Presence of brackish water.

Deep inside the sea these two conditions are not available so green algae are not present in this level, instead algae inhabit littoral zone of water.

### Question: 6

State what does standing crop of a tropical represent.

[1]

#### Answer:

Number of individual surviving in a particular area at a given time duration is called standing crop, measurement is done as a biomass present in that particular area.



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**Question: 7**

Why is use of unleaded petrol recommended for motor vehicle equipped with catalytic converter? [1]

**Answer:**

Present of catalytic converter in motor vehicle because unleaded petrol is added with aromatic hydrocarbons and alkenes to increase the octane number with emission of less pollutant in the atmosphere.

**Question: 8**

Name the type of biodiversity represented in the following,

- 1000 varieties of mango in India
- Variation in terms of potency and concentration of reserpine in *Rouwolfia vomitoria* growing in different region of Himalayas. [1]

**Answer:**

Biodiversity is defined as the sum of all the diversity *Rouwolfia vomitoria* present in a given area. Genetic diversity deals with the genetic variation within a species.

- 1000 varieties of mango in India show Genetic diversity.
- Variation in terms of potency and concentration of reserpine in growing in different region of Himalayas shows Genetic diversity.

**Section: B****Question: 9**

In angiosperm zygote is diploid while primary endosperm is triploid explain? [2]

**Answer:**

After the release of two male gametes into the cytoplasm of synergid it starts to move toward the egg and fertilize the egg, process is called as syngamy resulting in the formation of diploid cell called Zygote. Meanwhile, other gamete moves toward polar nuclei located between central cells which then fused to produce triploid primary endosperm nucleus (PEN).

During this process three haploid nuclei fusion occur and process is termed as triple fusion. Occurrence of syngamy and triple fusion at same time is designated as double fertilization.

**Question: 10**

A cross between a red flower bearing plant and a white flower bearing plant of *Antirrhinum* produced all plants having pink flowers. Work out a cross to explain how this is possible. [2]

**Answer:**

Snapdragon or *Antirrhinum* sp. is a good example for the study of incomplete dominance. In a cross between true breeding red flowered (RR) and true breeding white flowered plants (rr), the F<sub>1</sub> (Rr) was pink. When the F<sub>1</sub> was self-pollinated the F<sub>2</sub> resulted in the following ratio 1 (RR) Red: 2 (Rr) Pink: 1 (rr) White.

Ratio of the genotype is same as explained by Mendelian monohybrid cross mean while phenotypic ratio obtained was 3:1. Because R was incompletely dominant over r this made it possible to distinguish Rr as pink from RR (red) and rr (white).



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**Question: 11**

List two main propositions of Oparin and Haldane?

[2]

**Answer:**

Two main propositions of Oparin and Haldane include,

- ❖ First form of life would have progressed from the pre-existing non-living organic molecules such as RNA, protein, etc.
- ❖ Second form of life was preceded by chemical evolution with the formation of organic and inorganic molecules.

**Question: 12**

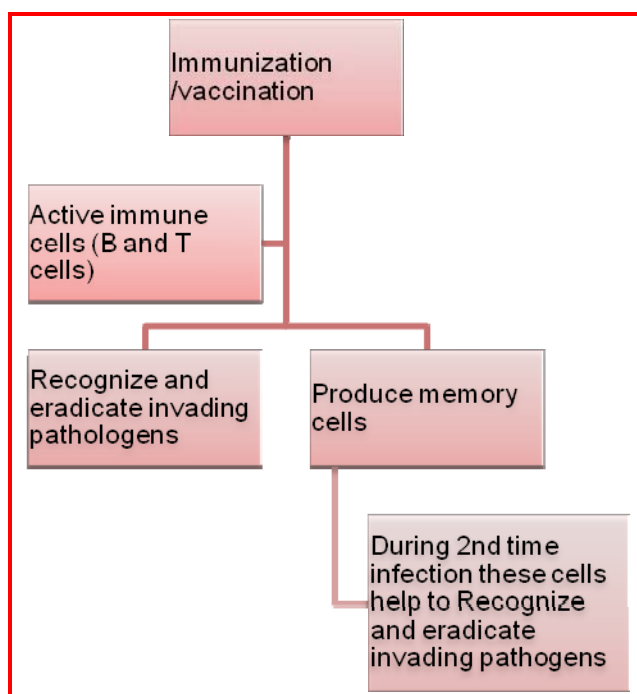
Write the event that takes place when a vaccine for any disease is introduced in the body?

[2]

**Answer:**

Immunization and vaccination are based on the concept of our immune cells to generate memory cells when encounter certain infection or disease. This process includes preparation of antigenic proteins from pathogen or inactivated/weakened pathogens which are introduced into the body.

The antibodies produced against the introduced antigen will neutralize the pathogenic effect at the time of infection.



Vaccines are mainly responsible for the activation B and T cells to recognize and eradicate invading pathogens. Frequent infection by a pathogen leads to the increase in number of memory cell, which directly increase the efficacy of response in a short time duration e.g., vaccine for tetanus, polio etc. This type of immunization is called passive immunization.

OR

Why a person with cut and bruises following an accident administered tetanus antitoxin? Give reason.



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**Answer:**

At early stage of children's life they all are injected with some vaccines which prevent them from polio, diphtheria, pneumonia and tetanus causing microorganism.

- Administration of tetanus antitoxin after any cut or bruises elevates the rate of effective Eradication microorganism *Clostridium tetani*. While these anti toxins also simulate the memory cells for effective response and production of more memory cells.
- *Clostridium tetani*, a bacterium characterized by germ positive, rod shaped, obligates anaerobic bacterium. Infection by this microorganism release a neurotoxin called tetanospasmin which results in stiffness and contraction of muscles fibers.

**Question: 13**

Name the bacterium responsible for the large hole seen in “Swiss cheese” what are these holes due to? [2]

**Answer:**

Holes present in ‘Swiss cheese’ are because of the production of increased amount of  $\text{CO}_2$  by a bacterium called *Propionibacterium sharmanii*. Similarly in ‘Roquefort cheese’ a specific fungus is used for ripening which in turn provides flavor to the cheese.

**Question: 14**

Name the source of DNA polymerase used in PCR technique. Mention why it is used? [2]

**Answer:**

DNA polymerase used in PCR technique is isolated from bacterium *Thermus aquaticus*. Use of DNA polymerase is attributed to its stability to resist and sustain at a very high temperature during renaturation of double stranded DNA.

**Question: 15**

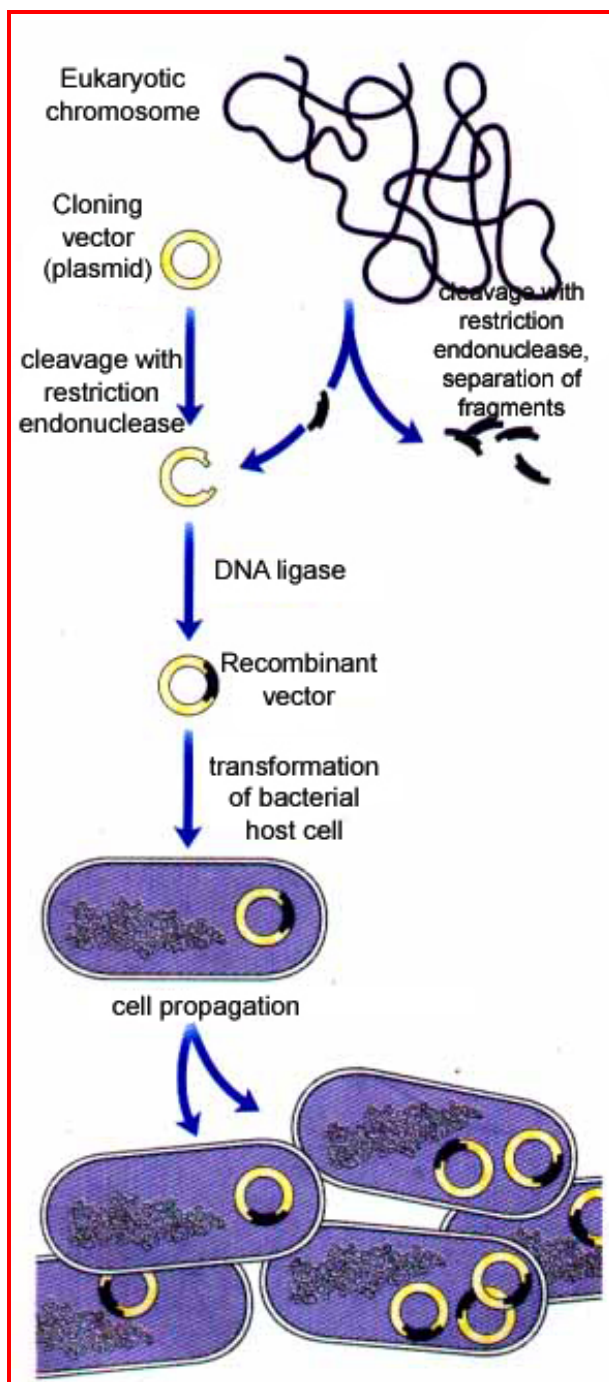
Write any four ways used to introduce a desired DNA segment into bacterial cell in recombinant technology experiments. [2]

**Answer:**

Recombinant DNA technology involves several steps in specific sequence

- Isolation and fragmentation of DNA by restriction endonucleases isolation of a desired DNA fragment.
- Ligation of the DNA fragment into a vector.
- Transferring the recombinant DNA into the host.
- Culturing the host cells in a medium at large scale and extraction of the desired product.





**Question: 16**

Why is proinsulin so called? How insulin differs from it?

[2]

**Answer:**

Insulin is made up of two peptide chain as chain A (21 amino acid) and chain B (30 amino acid), join together by disulfide bond at position 7 (both A and B chain) and 20 of A and 19 of B chain. Human insulin is 51 amino acid chains having 5808 Da molecular weight.



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Among human insulin is synthesized as a prohormon which is then processed by the removal of C peptide chain by endopeptidases, resulting in formation of active insulin. Insulin is used for the treatment of diabetic, earlier it was obtained from slaughtered cattle's and pigs but because of its allergic reaction the use of this type of insulin was restricted.

**Question: 17**

Where would you expect more species biodiversity – in tropical or in polar region give reasons in support of your answer? [2]

**Answer:**

Distribution of microorganism, vertebrate or invertebrate is not uniform throughout globe. It is recorded that biodiversity is highest toward the tropical region not at the polar regions. Reason for the more biodiversity toward the tropical region is because of constant environment and constant energy from sun, contributing to the higher biomass and richness in diversity. Because of which species-area relationship is generally a rectangular hyperbolic function.

**Question: 18**

"It is possible that a species may occupy more than one trophic level in the same eco system at the same time." Explain with the help of one example. [2]

**Answer:**

It is possible that organism may occupy more than one trophic level at a time. It must be taken in consideration that trophic level represent functional level, not a species as such for example, a sparrow is a primary consumer when it eats seeds, fruits, peas, and a secondary consumer when it eats insects and worms.

**Section: C**

**Question: 19**

Suggest and explain any three ART to an infertile couple. [3]

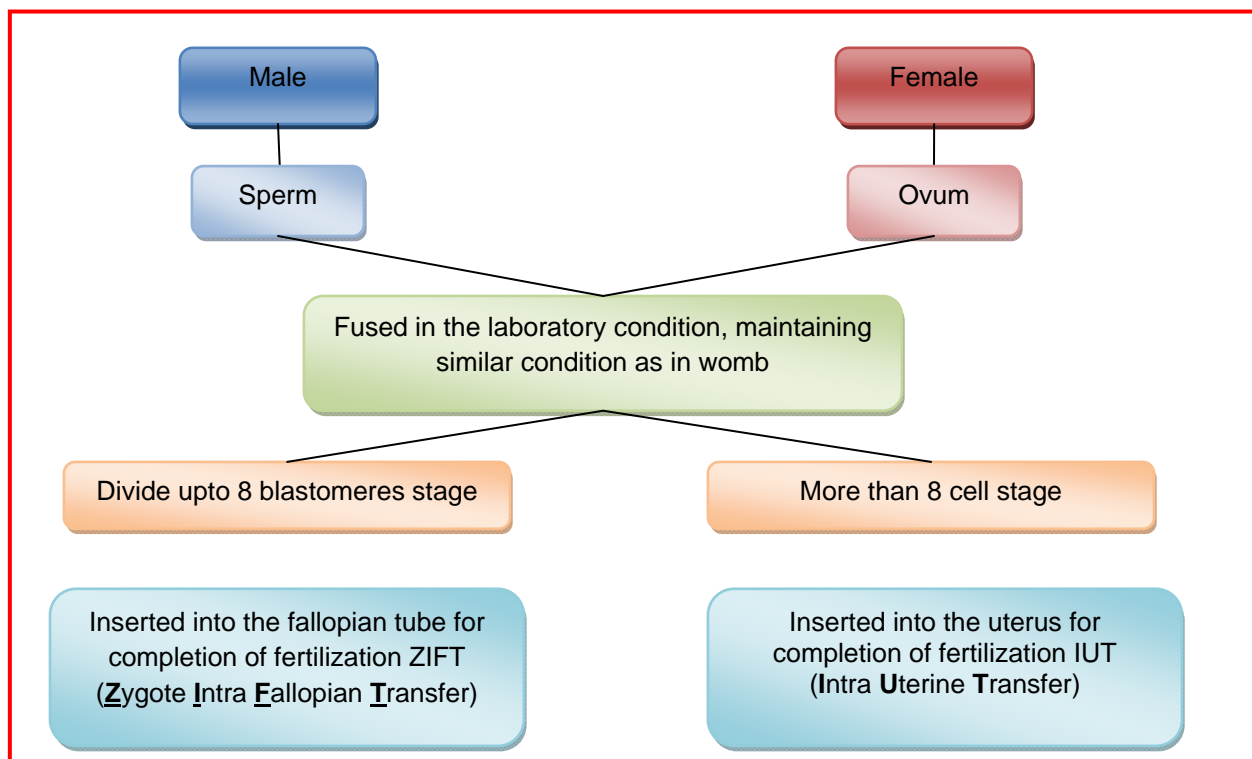
**Answer:**

Infertility is now a day has become major problem among the urban areas in India, women's were always blamed for infertility without knowing root of the problem (male or female). There may be various reasons for infertility such as physical, congenital, disease, drugs, immunological or even psychological.

Now a day's specialized health care units were established for the diagnosis and assists couples looking for child the whole process is commonly known as assisted reproductive technologies (ART). These include various technologies which require highly specialized skill and expensive instrumentation.

- a. In vitro fertilization (IVF-fertilization outside the body with maintenance of conditions that is present in the womb.) this method, popularly known as test tube baby.





Ova from the wife/donor (female) and sperms from the husband/donor (male) are collected and are induced to form zygote in the laboratory. The zygote or early embryos (with up to 8 blastomeres) is then transferred into the fallopian tube (ZIFT, **Z**ygote **I**ntra **F**allopian **T**ransfer) and embryos with more than 8 blastomeres, into the uterus (IUT, **I**ntra **U**terine **T**ransfer), to complete its further development.

Embryos formed by in vivo fertilization (fusion of gametes within the female) also could be used for such transfer to assist those females who cannot conceive.

### Gamete intra fallopian transfer

Ovum is collected from a donor and inserted into the fallopian tube of another female who cannot produce baby but still provide suitable environment for fertilization and further development is another method attempted.

### Intra Cytoplasmic Sperm Injection (ICSI)

Here sperm is directly injected into the ovum; this procedure is used in cases where male partner is unable to inseminate the female or due to very low sperm counts during ejaculation.

### Artificial Insemination (AI)

In this technique, the semen collected either from the husband or a healthy donor is artificially introduced either into the vagina or into the uterus (IUI, IntraUterineInsemination) of the female.

OR

Explain the steps in the formation of an ovum from an oogonium in human.

[3]

### Answer:

Female reproductive system comprises of a pair of ovary, oviducts uterus, cervix, vagina and mammary glands for completing the process of fertilization up to parturition followed by lactation.





- Oogenesis is a process marked by the formation of female gamete, initiated at the embryonic stages. At initial stage cells undergo meiotic division at prophase I stage to form primary oocytes.
- Formation of primary to tertiary follicle completes first unequal mitotic division forming large number of haploid secondary oocytes from primary oocyte and a tiny first polar body.
- Tertiary follicle then undergoes maturation stage to form graafian follicle surrounded by a layer of membrane called zona pellucid.
- Mature graafian follicle then ruptures to release ovum and the process is called ovulation.

**Question: 20**

Why are human females rarely hemophilic? Explain how do hemophilic patient suffer?

[3]

**Answer:**

Hemophilia is sex linked recessive disease; it is transmitted from unaffected female carrier to male child with hemophilia. Here female genes are in heterozygous condition while the male remains expressive of this gene. This disease is characterized by encounters a cut he will face nonstop bleeding.

The family pedigree of Queen Victoria shows a number of hemophilic descendants as she was a carrier of the disease.

**Question: 21**

In a maternity clinic for some reason the authority are not able to hand over the two new born to their respective real parents. Name and describe the technique that you would suggest to sort out the matter?

[3]

**Answer:**

DNA testing or DNA profiling or DNA fingerprinting can be employed in identification of the baby's to their respective parents. Human genome sequence reveals that almost 99% of human genes are same and only differ in 1% that is being utilized to distinguish between individual.

Difference of 1% among the individual can be used for the identification of the parents. This difference exists in the form of difference in structure and sequence of base pair. DNA profiling will be done in order to find the variable sequence in the genome called Variable Number Tandem Repeat (VNTR). VNTR is remains very conserve among the individual, showing only slight variation among locus of allele in minisatellites.

Alleles of VNTR sequence are guarded by restriction endonuclease, which on digestion by same enzyme results in nearly unique Restriction Fragment Length Polymorphism (RFLP). On comparing the RFLP sequence parents of respective child can be identified.

**Question: 22**

Explain the increase in the numbers of melanic (dark winged) moths in the urban areas of post-industrialization period in England.

[3]

**Answer:**

Natural selection postulated Darwin is used to explain the concept of melanin in moth after industrialization. Before industrialization it was observed that there were lots of white winged moth on trees then that of dark or melanic moth. After industrialization number of melanic moth increased rapidly because predators will spot a moth against a contrasting background.

Under this condition the white-winged moth did not survive due to predators, dark-winged or melanic moth survived. Hence, moths that were able to camouflage themselves, i.e., hide in the background, survived.



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**Question: 23**

Describe how biogas is generated from activated sludge. List the components of biogas?

[3]

**Answer:**

Biogas is a mixture of gases (containing predominantly methane) produced by the microbial activity and which may be used as fuel. Some of the examples are fermentation, cheese making and beverage principally producing CO<sub>2</sub>. These bacteria's are called as methanogens e.g., Methanobacterium found commonly in anaerobic sludge.

These bacteria's are present in the rumen region of cattle and goats which helps in the breakdown of the cellulose and provide nutrition and are released in dung (gobar). Which is further used to obtain gobar gas.

Biogas plant consists of a concrete tank (10-15 feet deep) in which bio-wastes are collected and slurry of dung is fed. The biogas plant has an outlet, which is connected to a pipe to supply biogas to nearby houses. The spent slurry is removed through another outlet and may use as fertilizer.

Importance of this method is the availability of cow dung in huge amount in the rural areas.

Components of biogas

- Gas holder
- Sludge
- Digester
- Dung water
- Inlet and outlet pipes

**Question: 24**

Name the pests that destroy the cotton plants. Explain the role of Bacillus thuringiensis in protecting the cotton crop against the pest to increase the yield.

[3]

**Answer:**

Pests which can destroy cotton plants include insects belonging to family lepidopterans (tobacco budworm, armyworm), coleopterans (beetles) and dipterans (flies, mosquitoes). Bacillus thuringiensis is a bacterium which possesses Bt genes which is very toxic insecticidal protein (produced at specific phase or their life cycle) and have the property to kill pest so it is designated as biopesticide.

This protein is secreted as protoxin (inactive form), once it is ingested by the pest it gets into the gut of pest where the pH acts as a catalyst for conversion of protoxin to active toxin. The activated toxin binds to the surface of midgut epithelial cells and creates pores that cause cell swelling and lysis and eventually cause death of the insect.

The toxin is coded by a gene named cry. There are a number of them, for example the proteins encoded by the gene cryIAc and cryIAb control the cotton bollworms that of cryIAb control corn borer. Specific Bt toxin genes were isolated from Bacillus thuringiensis and incorporated into the several crop plants such as Bt cotton, Bt corn, rice, tomato, potato and soybean etc.

**Question: 25**

a. Write the importance of measuring the size of a population in a habitat or ecosystem.



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**Answer:**

Population size is not static, keeps on changing with time depending on availability of food and predator pressure. Importantly it inform about fluctuation occurring in ecosystem due to Natality, immigration, mortality and emigration.

**Natality**

It is defined as the ability of an individual to produce a new individual, it is also referred to as birth rate. Natality is expressed as number of individual produced at a time.

**Mortality**

It is defined as the death of individual in a population; it is also referred to as death rate. Mortality is expressed as number of individual died at a given time. Mortality rate changes with respect to population and environmental condition.

**Immigration**

When individual of same species migrate or inhabit in a new place during a time period.

**Emigration**

It is the total number of people migrating from one place to inhabit a new place.

- b. Explain with the help of example how the percentage cover is a more meaningful measure of population size than mere number. [3]

**Answer:**

Growth of population may be result of competition or prey predator ration or use of any agent to kill organism, all these are expressed in terms of population size (designated by N). Size of a population may be determined either by calculating number of individual or by percentage cover or total biomass. Depending upon the study to be conducted we can use either of the methods.

E.g. in a given area there are 400 Parthenium plants but only a single banyan tree then it won't be correct to state that density of banyan tree is lower to that of 400 Parthenium plants, here the important determining factor will be percentage cover or the total biomass provided by the plants in comparison.

**Question: 26**

Differentiate between types of pyramids of biomass with the help of example. [3]

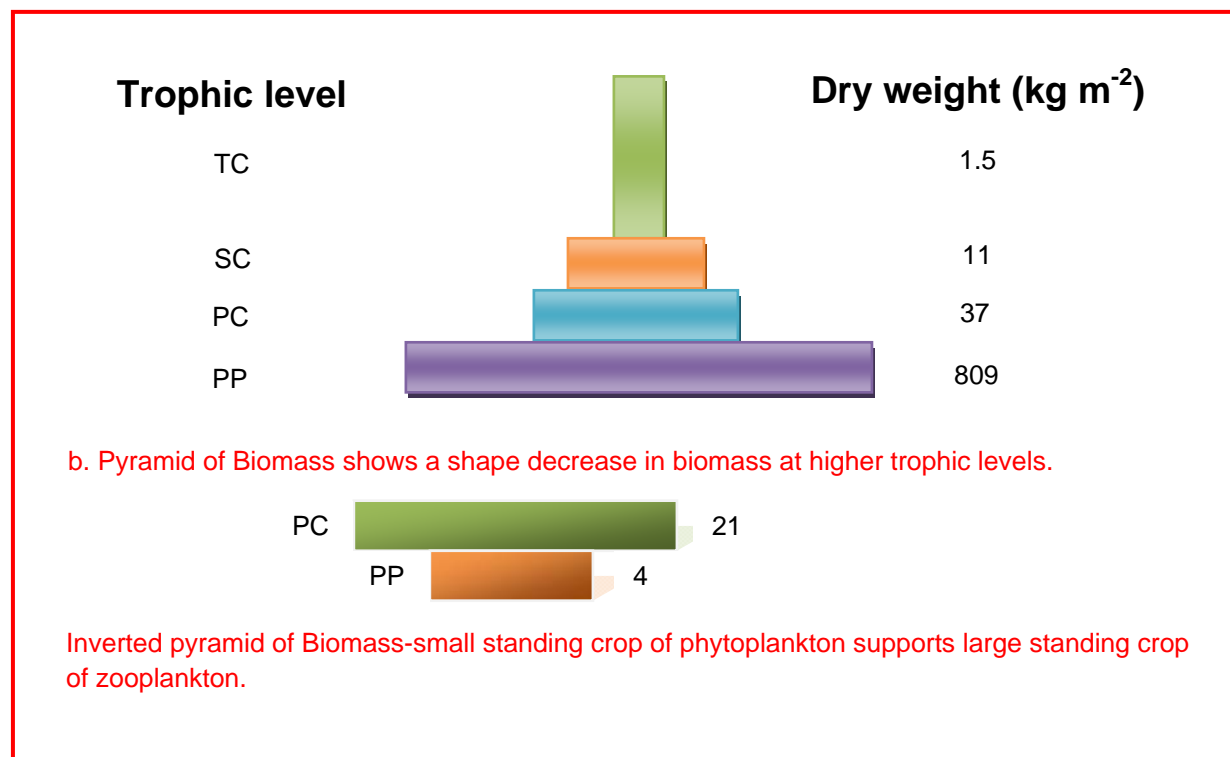
**Answer:**

Pyramid is board and it is narrow towards the apex. Similar pyramids are used to express food or energy in relation to organism at different level, represented in terms number, biomass or energy. Base of the pyramid represent a broad group of organism called first trophic level, while the apex is tertiary level.

The three ecological pyramids that are usually studied are (a) pyramid number; (b) pyramid of biomass and (c) pyramid of energy



## Pyramid of biomass



Pyramids of biomass are upright in most of the condition, i.e., producers are more in number and biomass than the herbivores, and herbivores are more in number and biomass than the carnivores. Also energy at a lower trophic level is always more than at a higher level. Counting the number of insects feeding on a big tree will give pyramid of biomass. The pyramid of biomass in sea is also generally inverted because the biomass of fishes far exceeds that of phytoplankton.

### Question: 27

a. Describe the endosperm development in coconut.

#### Answer:

Formation of embryo is preceded by the formation of endosperm. The primary endosperm cell divided repeatedly and forms a triploid endosperm tissue, which are filled with reserved food material and nutrition required for development of zygote. The primary endosperm nucleus undergoes successive nuclear divisions to give rise to free nuclei.

This stage of endosperm development is called free-nuclear endosperm. Subsequently cell wall formation occurs and the endosperm becomes cellular. The number of free nuclei formed before cellularization varies greatly.

b. Why tender coconut is considered a healthy source of nutrition.

#### Answer:

The coconut water from tender coconut that you are familiar with, is nothing but free- nuclear endosperm (made up of thousands of nuclei) and the surrounding white kernel is the cellular endosperm. The cells of this cell of this tissue are filled with reserved food materials and are used for the nutrition of the developing embryo.



c. How are pea seed different from castor seeds with respect to endosperm?

[3]

**Answer:**

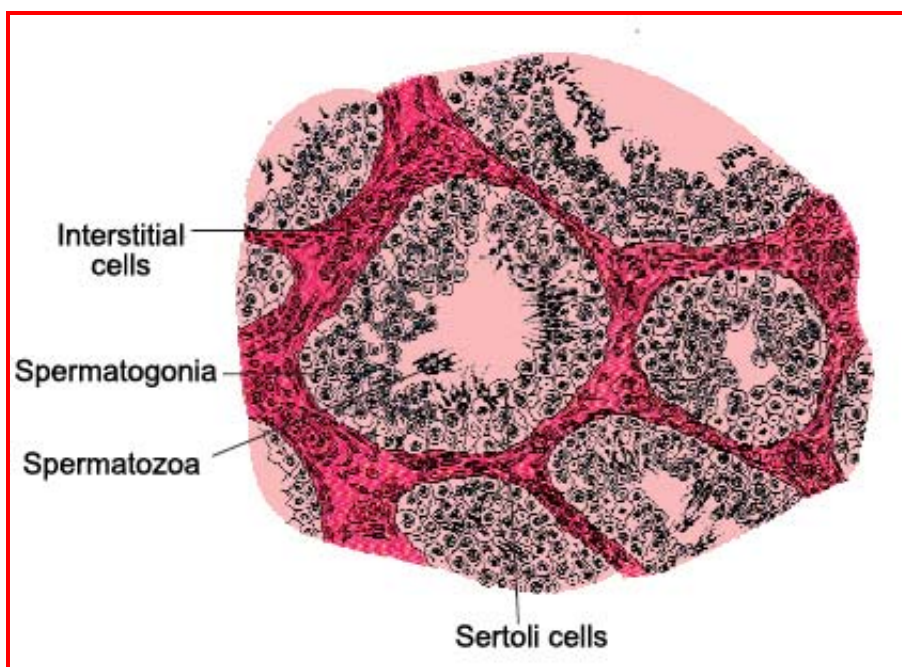
Endosperm may either be completely consumed by the developing embryo e.g., pea, groundnut, beans, before seed maturation or it may persist in the mature seed e.g. castor and coconut and be used up during seed germination.

**Section: D**

**Question: 28**

a. Draw a diagrammatic sectional view of human seminiferous tubule and label sertoli cells, primary spermatocyte spermatogonium and spermatozoa in it.

**Answer:**



*Human seminiferous tubule*

b. Explain the hormonal regulation of the process of spermatogenesis in human.

[5]

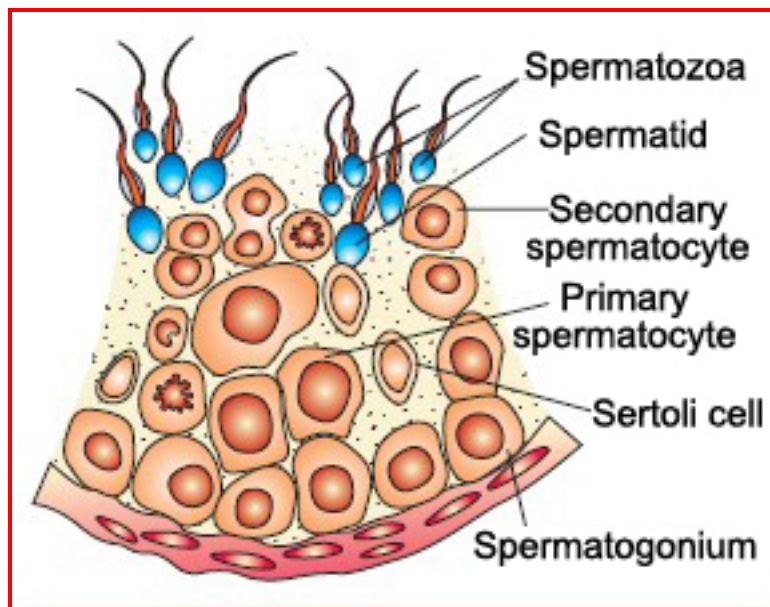
**Answer:**

- Testis, primary sex organ of male and produce gametes by the process of gametogenesis. Spermatogenesis begin at puberty, spermatogonia present on the inside wall of seminiferous tubules multiply by meiotic division and increase in numbers.

Some of the spermatogonia called primary spermatocytes periodically undergo meiosis. A primary spermatocyte completes the first meiotic division (reduction division leading to formation of two equal, haploid cells called secondary spermatocytes, which have only 23 chromosomes each.

The secondary spermatocytes undergo the second meiotic division to produce four equal, haploid spermatids.





- Spermatogenesis starts at the age of puberty due to significant increase in the secretion of Gonadotropin Releasing Hormone (GnRH), is a hypothalamic hormone. The increased levels of GnRH then act at the anterior pituitary gland and stimulate secretion of two gonadotropins Luteinising Hormone (LH) and Follicle Stimulating Hormone (FSH).

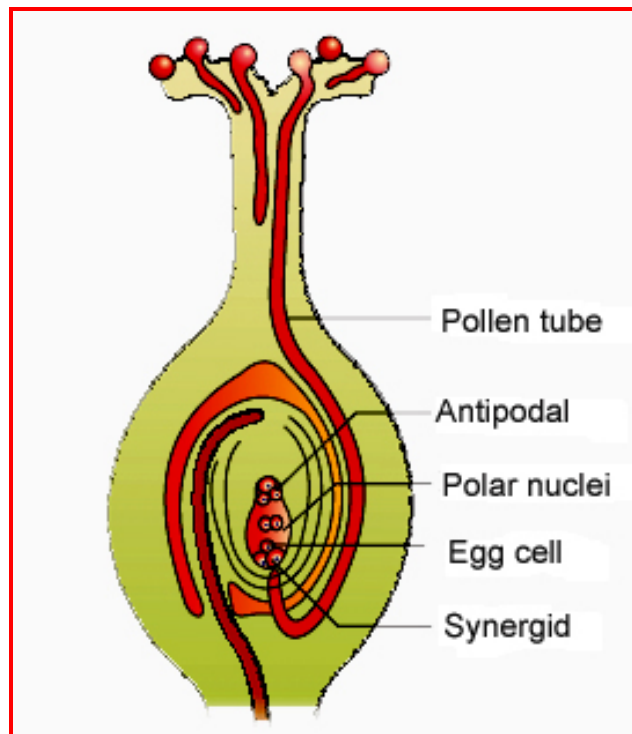
LH acts at the Leydig cells and stimulates synthesis and secretion of androgens. Androgens, in turn, stimulate the process of spermatogenesis. FSH acts on the Sertoli cells and stimulates secretion of some factors which help in the process of spermatogenesis.

OR

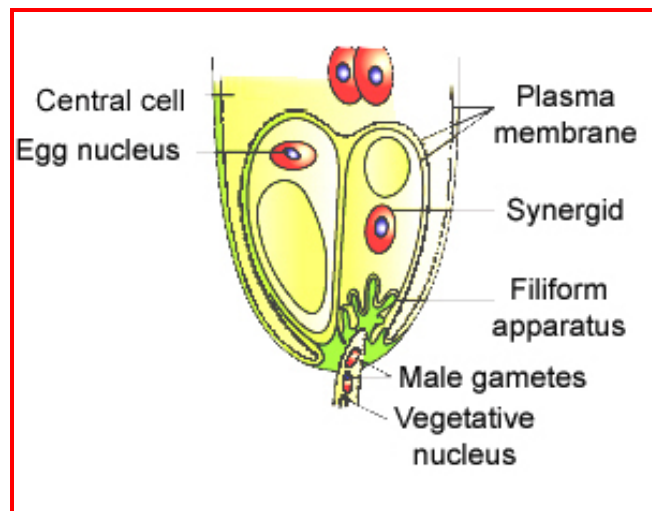
- Draw a L.S of a pistil showing pollen tube entering the embryo sac in and angiosperm and label any six parts other than stigma, style and ovary.



**Answer:**

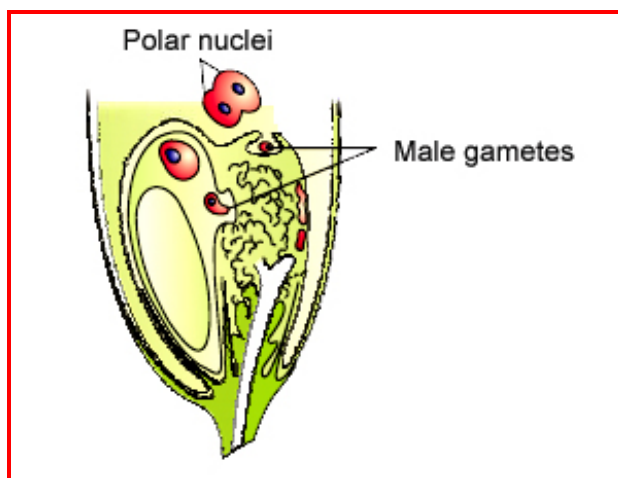


a. L.S of pistil showing path of pollen tube growth



b. Enlarged view of an egg apparatus showing entry of pollen tube into a synergid





c. Discharge of male gametes into a synergid and the movements of the sperm, one into the egg and the other into the central cell

b. Write the changes a fertilized ovule undergoes within the ovary in an angiosperm plant.

**Answer:**

Fertilization of ovule is preceded by the formation of male and female reproductive organs called as androecium and the gynoecium.

- Ovule is also called Mega sporangium because of its large size. Ovules remain attached to placenta by the help of funicle.
- Each ovule is surrounded by layers of protective covering called integuments except at the apex portion called micropyle. Integuments can further be divided into epidermis, endothecium, middle layers and the tapetum. Tapetum provided nutrition to the growing embryo.
- Each embryo sac or female gametophyte forms a megaspore by undergoing reduction division and the process is called megasporogenesis.
- Ovule then differentiates into a single megaspore mother cell, which further undergoes mitotic division to form two nuclei, which after successive division forms 8 nucleate stages called female gametophyte.

**Question: 29**

a. What is the conclusion drawn by Griffith at the end of his experiment with *Streptococcus pneumonia*.

**Answer:**

In 1928, Frederick Griffith, performed a series of experiments with *streptococcus pneumonia* (bacterium responsible for pneumonia).

- When *Streptococcus pneumonia* (pneumococcus) bacteria are grown on a culture plate, some produce smooth shiny colonies (S) while others produce rough colonies (R). This is because the S strain bacteria have mucous (polysaccharide) coat, while R strain does not. Mice infected with the S strain (virulent) die from pneumonia infection but mice infected with the R strain do not develop pneumonia.

Griffith was able to kill bacteria by heating them. He observed that heat-killed S strain bacteria injected into mice did not kill them. When he injected a mixture of heat-killed S and live R bacteria, the mice died.





- He concluded that the R strain bacteria had somehow been transformed by the heat-killed S strain bacteria. Some 'transforming principle', transferred from the heat-killed S strain, had enabled the R strain to synthesize a smooth polysaccharide coat and become virulent. This must be due to the transfer of the genetic material.

b. How did Oswald Avery, Colin Macleod and Maclyn McCarty prove that DNA was the genetic material, Explain? [5]

**Answer:**

Oswald Avery, Colin MacLeod and Maclyn McCarty worked on transforming principle given by Griffith's experiment. They purified protein, DNA and RNA from heat-killed S cells to see which ones could transform live R cells into S cells. They discovered that DNA alone from S bacteria caused R bacteria to become transformed.

They also discovered that protein-digesting enzymes (proteases) and RNA-digesting enzymes (RNases) did not affect transformation, so the transforming substance was not a protein or RNA. Digestion with DNase did inhibit transformation, suggesting that the DNA caused the transformation. They concluded that DNA is hereditary material.

OR

a. Explain the mechanism of sex determination in human.

**Answer:**

Sex determination is an illegal method for determining sex of growing child in womb. The process of sex determination is based on the pattern of chromosomal distribution in amniotic fluid surrounding the developing embryo.

Human gamete are contain 23 pair of chromosome out of which 22 pairs remain same as in male and female, the only sex determining chromos is the 23<sup>rd</sup> pair XY chromosome. Only X chromosome is found in female while male possess X and Y chromosome, recombination of XX and XY crucial in determining the sex of the child.

- XX or XY sex determination
- XX or XO sex determination

**XX or XY sex determination**

XX or XY sex determination is the most common form of sex determination observed among human in which female only have same kind of sex chromosome XX, while male partner have XY chromosome. Size and shape of XY differ with that of autosomal chromosome.

**XX or XO sex determination**

In this system of sex determination female contains XX chromosome but the male partner lack Y chromosome and is left with XO. Here sex is determined by the amount of gene expressed across the two chromosomes. This type of chromosomal combination is found in insects, grasshopper, cricket, cockroach etc.

b. Differentiate between male heterogamete and female heterogamete with the help of an example.

**Answer:**

Male gamete may display two type of chromosome combination either OX or XY capable for determining the sex of the baby. This kind of variation is called as male heterogamete. Similarly when female produces two different type of gamete in relation to Z and W chromosomes is called female heterogamete.



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### ZW sex determination system

- Some bird, reptile and insects show heterogametic characteristics. ZW sex determination is opposite to that of present in human system with XY determinant. Here female possess ZW chromosome and male (ZZ) have only one type of chromosome.
- Female moth and some butterflies show different pairing of chromosome such as ZO or ZZW.

### Question: 30

Person in your colony has recently been diagnosed with AIDS. People/residents in the colony want him to leave the colony for the fear of spread of AIDS.

- a. Write your views on the situation giving reasons.

#### Answer:

AIDS is caused by Human Immuno deficiency Virus (HIV) belongs to the group retrovirus. It does not spread by touching or by physical contact it only spreads through the body fluid either blood or seminal fluid.

Virus enters inside the body and multiply in numbers to cause the disease or either these virus may reside in the mucosal lining where it remain latent or dormant for few years to many years. Based upon the latency this viral infection may reveal the symptom. Therefore the HIV/AIDS infected persons should not isolated from family and society; they must be loved and cared.

- b. List the possible preventive measures that you would suggest to the residents of your locality in a meeting organized by you so that they understand the situation.

#### Answer:

Preventive measure will include-

- ❖ Avoid multiple sexual partners.
- ❖ Always use new sterilized needle for injection.
- ❖ Always use new blades during shaving.
- ❖ Pregnant women should check whether child is infected or not.

- c. Write the symptom and causative agent of AIDS.

[5]

#### Answer:

Symptom

- HIV after getting in association with helper T cell and with macrophages they start to increase their number and during this period, the person suffers from bouts of fever, diarrhea, and weight loss.
- Due to decrease in the number of helper T lymphocytes, the person starts suffering from infections that could have been otherwise overcome such as those due to bacteria especially Mycobacterium, viruses, fungi and even parasites like Toxoplasma.
- The patient becomes so immuno deficient that he/she is unable to protect himself/herself against these infections.
- A widely used diagnostic test for AIDS is enzyme linked immunosorbent assay (ELISA). Treatment of AIDS with anti-retroviral drugs is only partially effective. They can only prolong the life of the patient but cannot prevent death, which is inevitable.

### Causative agent of AIDS

AIDS is caused by the Human Immuno deficiency Virus (HIV), a member of a group of viruses called retrovirus, which have an envelope enclosing the RNA genome.

