LIBERTY PAPER SET

STD. 12 : Biology

Full Solution

Time : 3 Hours **ASSIGNTMENT PAPER 7**

Part A

1. (D) **2.** (B) **3.** (C) **4.** (C) **5.** (A) **6.** (B) **7.** (C) **8.** (B) **9.** (B) **10.** (A) **11.** (D) **12.** (A) **13.** (D) **14.** (C)
15. (B) **16.** (D) **17.** (A) **18.** (C) **19.** (D) **20.** (A) **21.** (C) **22.** (C) **23.** (A) **24.** (B) **25.** (D) **26.** (A) **27.** (D)
28. (C) **29.** (A) **30.** (D) **31.** (D) **32.** (D) **33.** (B) **34.** (C) **35.** (D) **36.** (A) **37.** (C) **38.** (B) **39.** (A) **40.** (D)
41. (A) **42.** (A) **43.** (C) **44.** (D) **45.** (D) **46.** (B) **47.** (B) **48.** (C) **49.** (A) **50.** (D)

Part B

Section A

➢ **Write the answer of the following questions : (Each carries 2 Mark)**

1.

➥ The process of formation of megaspores from the megaspore mother cell is called megasporogenesis.

- Ovules generally differentiate a single megaspore mother cell (MMC) in the micropylar region of the nucellus.
- It is a large cell containing dense cytoplasm and a prominent nucleus.
- The MMC undergoes meiotic division.
- Meiosis results in the production of four megaspores.

2.

➥ The period for which pollen grains remain viable is highly variable and to some extent depends on the prevailing temperature and humidity.

- In some cereals such as rice and wheat, pollen grains lose viability within 30 minutes of their release, and in some members of Rosaceae, Leguminoseae and Solanaceae, they maintain viability for months.
- Once they are shed, pollen grains have to land on the stigma before they lose viability if they have to bring about fertilisation.

➥ Pollen grains are rich in nutrients. It has become a fashion in recent years to use pollen tablets as food supplements.

- In western countries, a large number of pollen products in the form of tablets and syrups are available in the market.
- Pollen consumption has been claimed to increase the performance of athletes and race horses.

3.

➥ Barrier Method.

➥ In barrier methods, ovum and sperms are prevented from physically meeting with the help of barriers. Such methods are available for both males and females.

(i) Condoms :

➥ Condoms are barriers made of thin rubber/ latex sheath that are used to cover the penis in the male or vagina and cervix in the female, just before coitus so that the ejaculated semen would not enter into the female reproductive tract.

➥ This can prevent conception.

➥ 'Nirodh' is a popular brand of condom for the male.

➥ Use of condoms has increased in recent years due to its additional benefit of protecting the user from contracting STIs and AIDs.

➥ Both the male and the female condoms are disposable, can be self-inserted and thereby gives privacy to the user.

(ii) Diaphragms, cervical caps and vaults :

➥ Diaphragms, cervical caps and vaults are also barriers made of rubber that are inserted into the female reproductive tract to cover the cervix during coitus.

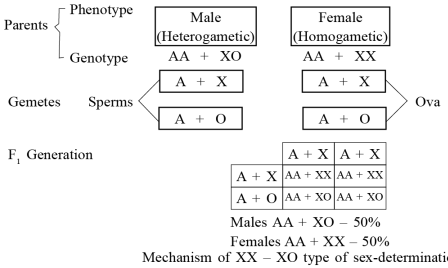
➥ They prevent conception by blocking the entry of sperms through the cervix.

➥ They are reusable.

➥ Spermicidal creams, jellies and foams are usually used alongwith these barriers to increase their contraceptive efficiency.

4.

➥ XX-XO Mechanism : Here, male is heterogametic, i.e. XO (Gametes with X and gametes wihtout X) and female is homogametic, i.e. XX (all gametes are with X-chromosomes) E.g. Many insects such as grasshopper.



Males AA + XO – 50%
Females AA + XX – 50%
Mechanism of XX – XO type of sex-determination

5.

➥ The salient features of the Double-helix structure of DNA are as follows :

(i) It is made of two polynucleotide chains, where the backbone is constituted by sugar-phosphate, and the bases project inside.

(ii) The two chains have anti-parallel polarity. It means, if one chain has the polarity 5' → 3', the other has 3' → 5'.

(iii) The bases in two strands are paired through hydrogen bond (H-bonds) forming base pairs (bp). Adenine forms two hydrogen bonds with Thymine from opposite strand and vice-versa. Similarly, Guanine is bonded with Cytosine with three H-bonds. As a result, a purine always comes opposite to a pyrimidine. This generates approximately uniform distance between the two strands of the helix as shown (Figure).

(iv) The two chains are coiled in a right-handed fashion. The pitch of the helix is 3.4 nm (a nanometre is one billionth of a metre, that is 10^{-9} m) and there are roughly 10 bp in each turn. Consequently, the distance between a bp in a helix is approximately 0.34 nm.

(v) The plane of one base pair stacks over the other in double helix. This, in addition to H-bonds, confers stability of the helical structure (Figure).

6.

➥ This is the interaction in which one species benefits and the other is neither harmed nor benefited.

➥ An orchid growing as an epiphyte on a mango branch, and barnacles growing on the back of a whale benefit while neither the mango tree nor the whale derives any apparent benefit.

➥ The cattle egret and grazing cattle in close association, a sight you are most likely to catch if you live in farmed rural areas, is a classic example of commensalism.

➥ The egrets always forage close to where the cattle are grazing because the cattle, as they move, stir up and flush out insects from the vegetation that otherwise might be difficult for the egrets to find and catch.

➥ Another example of commensalism is the interaction between sea anemone that has stinging tentacles and the clown fish that lives among them. The fish gets protection from predators which stay away from the stinging tentacles. The anemone does not appear to derive any benefit by hosting the clown fish.

7.

➥ The most important of them are :

➥ (i) Genetic diversity :

- A single species might show high diversity at the genetic level over its distributional range.
- The genetic variation shown by the medicinal plant *Rauwolfia vomitoria* growing in different Himalayan ranges might be in terms of the potency and concentration of the active chemical (reserpine) that the plant produces.
- India has more than 50,000 genetically different strains of rice, and 1,000 varieties of mango.

➥ (ii) Species diversity :

- The diversity at the species level, for example, the Western Ghats have a greater amphibian species diversity than the Eastern Ghats.

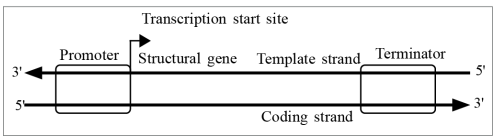
➥ (iii) Ecological diversity :

- At the ecosystem level, India, for instance, with its deserts, rain forests, mangroves, coral reefs, wetlands, estuaries, and alpine meadows has a greater ecosystem diversity than a Scandinavian country like Norway.

8.

- Pathogen : *Streptococcus pneumonia and Haemophiles influenza*
- Spread through :
  - Droplets or aerosols released by an infected person through coughing or sneezing. Inhalation or by using the utensils of an infected person.
  - As a result of infection, the alveoli get filled with fluid leading to severe problem in respiration.
- Symptoms :
  - Fever, chills, cough and headache
  - In severe condition, the lips and fingers become gray to blue in color.
- Treatment : Antibiotics

9.



10.

- Humans have always depended on nature for food and shelter, but when 'need' turns to 'greed', it leads to over-exploitation of natural resources.
- Many species extinctions in the last 500 years (Steller's sea cow, passenger pigeon) were due to overexploitation by humans.
- Presently many marine fish populations around the world are over harvested, endangering the continued existence of some commercially important species.

11.

- An ideal contraceptive should be
  (i) user-friendly
  (ii) easily available
  (iii) effective and reversible with no or least side-effects.
  (iv) it also should in no way interfere with the sexual drive, desire and/or the sexual act of the user.

12.

- We use microbes. Our products are derived from them everyday.
- 1. Curd : LABs are lactic acid bacteria.
  - They grow in milk and convert it to curd.
  - During growth, the LAB produce acids that coagulate and partially digest the milk proteins.
  - A small amount of a curd added to the fresh milk as inoculum or starter contain millions of LAB, which at suitable temperatures multiply, thus converting milk to curd.
  - LAB improves milk quality by increasing vitamin B12.
  - In our stomach too, the LAB play very beneficial role in checking diseases causing microbes.
- 2. Cheese :
  - Cheese is an edible substance. Microbes are used at different stages of cheese making.
  - Different varieties of cheese are known by their characteristic texture, flavour and taste which is given by specific microbes used in the cheese production.
  - The large holes in "swiss cheese" are due to production of a large amount of carbon dioxide by a bacterium named *Propionibacterium sharmanii.*
  - The "Roquefort cheese" are ripened by growing a specific fungi on them, which gives them a particular flavour.

➥ 3. Batter :

➥ The batter of dosa and idli is fermented by using bacteria. This batter looks puffed because of the production of carbon dioxide.

➥ The dough, which is used for making bread, is fermented using saccharomyses cerevisiae- baker's yeast.

➥ 4. Toddy :

➥ Some traditional drink and food is also produced by the help of microbes through fermentation.

➥ In South India, traditional drink toddy is made by fermenting sap from palms.

➥ 5. Other food items :

➥ To produce different food items fish, soyabean, bamboo etc. are passed through fermentation.

Section B

➢ **Write the answer of the following questions : (Each carries 3 Mark)**

13.

➥ Some of the salient observations drawn from human genome project are as follows :

(i) The human genome contains 3164.7 million bp.

(ii) The average gene consists of 3000 bases, but sizes vary greatly, with the largest known human gene being dystrophin at 2.4 million bases.

(iii) The total number of genes is estimated at 30,000 - much lower than previous estimates of 80,000 to 1,40,000 genes. Almost all (99.9 per cent) nucleotide bases are exactly the same in all people.

(iv) The functions are unknown for over 50 per cent of the discovered genes.

(v) Less than 2 per cent of the genome codes for proteins.

(vi) Repeated sequences make up very large portion of the human genome.

(vii) Repetitive sequences are stretches of DNA sequences that are repeated many times, sometimes hundred to thousand times. They are thought to have no direct coding functions, but they shed light on chromosome structure, dynamics and evolution.

(viii) Chromosome 1 has most genes (2968), and the Y has the fewest (231).

(ix) Scientists have identified about 1.4 million locations where single-base DNA differences (SNPs - single nucleotide polymorphism, pronounced as 'snips') occur in humans. This information promises to revolutionise the processes of finding chromosomal locations for disease-associated sequences and tracing human history.

14.

➥ Surgical Method of sterilisation :

➥ Surgical methods, also called sterilisation, are generally advised for the male/female partner as a terminal method to prevent any more pregnancies.

➥ Surgical intervention blocks gamete transport and thereby prevent conception.

(1) Vasectomy :

➥ Sterilisation procedure in the male is called 'vasectomy'.

➥ In vasectomy, a small part of the vas deferens is removed or tied up through a small incision on the scrotum.

(2) Tubectomy :

➥ Sterilisation procedure in female, is called tubectomy.

➥ In tubectomy, a small part of the fallopian tube is removed or tied up through a small incision in the abdomen or through vagina.

➥ These techniques are highly effective but their reversibility is very poor.

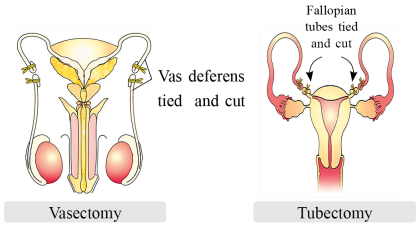
➥ It needs to be emphasised that the selection of a suitable contraceptive method and its use should always be undertaken in consultation with qualified medical professionals.

➥ One must also remember that contraceptives are not regular requirements for the maintenance of reproductive health.

➥ In fact, they are practiced against a natural reproductive event, i.e., conception/pregnancy. One is forced to use these methods either to prevent pregnancy or to delay or space pregnancy due to personal reasons.

➥ No doubt, the widespread use of these methods has a significant role in checking uncontrolled growth of population.

- However, their possible ill-effects like nausea, abdominal pain, breakthrough bleeding, irregular menstrual bleeding or even breast cancer, though not very significant, should not be totally ignored.



15.

- Antibiotics are chemical substances which is produced by microbes. It kills pathogenic microbes or slow down their growth.
- This chemicals are called antibiotics.

  (anti=opposite, bio= life)

  e.g. Penicillin is the first discovered antibiotic.
- Discovery :
  - Alexander Fleming while working on *staphylococci* bacteria , once observed a mould growing in one of his unwashed culture plated around which staphylococci could not grow.
  - He found out that it was due to a chemical produced by the mould and he named it penicillin after the mould penicillium notatum.
  - This antibiotic was extensively used to treat American soldiers wounded in world war II
  - Fleming, chain and flory were awarded the Nobel prize in 1945, for this discovery.
- Microbes, especially yeasts have been used from time immemorial for the production of beverages like wine, beer, whisky, brandy or rum.
- For this purpose the same yeast *saccharomyces cerevisiae* used for bread-making and commonly called brewer's yeast, is used for fermenting malted cereals and fruit juices, to produce ethanol.
- Depending on the type of the raw material used for fermentation and the type of processing (with or without distillation) different types of alcoholic drinks are obtained.
- Wine and beer are produced without distillation whereas whisky, brandy and rum are produced by distillation of the fermented broth.

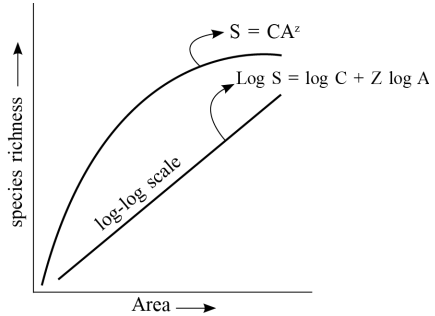
16.

- Biopiracy is the term used to refer to the use of bio-resources by multinational companies and other organisations without proper authorisation from the countries and people concerned without compensatory payment.
- Most of the industrialised nations are rich financially but poor in biodiversity and traditional knowledge.
- In contrast the developing and the underdeveloped world is rich in biodiversity and traditional knowledge related to bio-resources.
- Traditional knowledge related to bio-resources can be exploited to develop modern applications and can also be used to save time, effort and expenditure during their commercialisation.
- There has been growing realisation of the injustice, inadequate compensation and benefit sharing between developed and developing countries.
- Therefore, some nations are developing laws to prevent such unauthorised exploitation of their bio-resources and traditional knowledge.
- The Indian Parliament has recently cleared the second amendment of the Indian Patents Bill, that takes such issues into consideration, including patent terms, emergency provisions and research and development initiative.

17.

- During his pioneering and extensive explorations in the wilderness of South American jungles, the great German naturalist and geographer Alexander von Humboldt observed that within a region species richness increased with increasing explored area, but only up to a limit.
- In fact, the relation between species richness and area for a wide variety of taxa (angiosperm plants, birds, bats, fresh water

fishes) turns out to be a rectangular hyperbola.



- On a logarithmic scale, the relationship is a straight line described by the equation
- log S = log C + Z log A
- Where,
  - S = Species richness
  - A = Area
  - Z = slope of the line (regression coefficient)
  - C = Y-intercept
- Ecologists have discovered that the value of Z lies in the range of 0.1 to 0.2, regardless of the taxonomic group or the region (whether it is the plants in Britain, birds in California or molluscs in New York state, the slopes of the regression line are amazingly similar).
- But, if you analyse the species-area relationships among very large areas like the entire continents, you will find that the slope of the line to be much steeper (Z values in the range of 0.6 to 1.2).
- For example, for frugivorous (fruit-eating) birds and mammals in the tropical forests of different continents, the slope is found to be 1.15.

18.

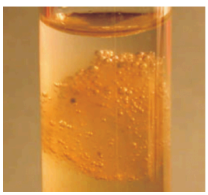
- Evidence of the emergence and development of life on earth is obtained from many directions.
- Fossils are the hard parts of life forms in rocks.
- Rocks, sediments and layers of the Earth's layers indicate the layering of organic elements over Earth's long history.
- Sedimentary rocks of different ages contain fossils of different life forms that must have died out during the formation of these particular rocks.
- Some of them show similarities with modern organisms. They represent extinct organisms.
- This study shows that life-forms change with time. And some life-forms do not change for certain planetary periods.
- Therefore, new life-forms have come into existence at different times in the history of the earth.
- All this is called fossil evidence.
- The age of fossils can be known by the method of radioactivity-dating.

19.

- (a) Amoebiasis (Amoebic dysentery) : Pathogen is *Entamoeba histolytica*.
  - Mode of transmission : Housefiles (mechanical carriers) transmit parasites from faeces to food & water.
  - Symptoms : Constipation, abdominal pain and cramps, stools with excess mucus and blood clots.
- (b) Filariasis (Elephantiasis) : Pathogen is *Filarial worms* or *Wuchereria* (W. bancrofti & W. malayi).
  - Mode of transmission : Bite of female Culex mosquito.
  - Symptoms : Filarial worms live in lymphatic vessels (usually of lower limbs). It causes chronic inflammation of the organs in which they live for many years. Limbs and genital organs may be deformed.
- (c) Ring worms : Pathogens are *Microsporum, Trichophyton & Epidermophyton*. They are seen in groin, b/w toes etc.
  - Mode of transmission : From soil or by using towels, cloths, comb etc. Heat and noisture help fungi to grow.
  - Symptoms : Dry, scaly lesions on skin, nails, scalp etc. Intense itching.

20.

- Nucleic acid is the genetic material of all organisms without exception.
- In majority of organisms this is deoxyribonucleic acid or DNA.
- In order to cut the DNA with restriction enzymes, it needs to be in pure form, free from other macro-molecules.
- Since the DNA is enclosed within the membranes, we have to break the cell open to release DNA along with other macromolecules such as RNA, proteins, polysaccharides and also lipids.
- This can be achieved by treating the bacterial cells/plant or animal tissue with enzymes such as lysozyme (bacteria), cellulase (plant cells), chitinase (fungus).
- Genes are located on long molecules of DNA interwined with proteins such as histones.
- The RNA can be removed by treatment with ribonuclease whereas proteins can be removed by treatment with protease.
- Purified DNA ultimately precipitates out after the addition of chilled ethanol.
- This can be seen as collection of fine threads in the suspension.
- DNA that separates out can be removed by spooling.




21.

- For many decades, ecologists believed that communities with more species, generally, tend to be more stable than those with less species.
- A stable community should not show too much variation in productivity from year to year; it must be either resistant or resilient to occasional disturbances (natural or man-made), and it must also be resistant to invasions by alien species.
- We don't know how these attributes are linked to species richness in a community, but David Tilman's long-term ecosystem experiments using outdoor plots provide some tentative answers.
- Tilman found that plots with more species showed less year-to-year variation in total biomass.
- He also showed that in his experiments, increased diversity contributed to higher productivity.
- Rich biodiversity is not only essential for ecosystem health but imperative for the very survival of the human race on this planet.
- Biodiversity contributes to many important ecological services.

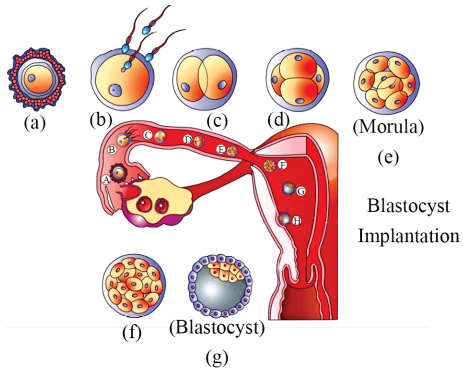
Section C

➢ **Write the answer of the following questions : (Each carries 4 Mark)**

22.

- Immediately after implantation, the inner cell mass (embryo) differentiates into an outer layer called ectoderm and an inner layer called endoderm.
- A mesoderm soon appears between the ectoderm and the endoderm.
- These three layers give rise to all tissues (organs) in adults.
- The inner cell mass contains certain cells called stem cells which have the potency to give rise to all the tissues and organs.
- The human pregnancy lasts 9 months.
- In human beings, after one month of pregnancy, the embryo's heart is formed. The first sign of growing foetus may be noticed by listening to the heart sound carefully through the stethoscope.
- By the end of the second month of pregnancy, the foetus develops limbs and digits.
- By the end of 12 weeks (first trimester), most of the major organ systems are formed, for example, the limbs and external genital organs are well-developed.
- The first movements of the foetus and appearance of hair on the head are usually observed during the fifth month.
- By the end of about 24 weeks (end of second trimester), the body is covered with fine hair, eye-lids separate, and eyelashes are formed.

➥ By the end of nine months of pregnancy, the foetus is fully developed and is ready for delivery.



➥ The zygote is formed at the ampulla-isthmus junction of the fallopian tube when the union of secondary oocyte and spermatozoa occurs. The zygote undergoes various divisions and changes before it reaches the uterus for implantation.

➥ The figure shows the various stages of development of a zygote as it passes through the oviduct and uterus:

(a) The zygote divides into a two-celled stage via division or 1st cleavage while the zygote is still in the isthmus of the oviduct.

(b) Several more mitotic divisions or cleavages occur in the 2 celled stage to form a 2, 4, 8 and finally a 16-celled stage of the zygote. The 16 celled stage is called the morula and various cells formed after cleavage are called blastomeres.

(c) Morula then changes into a blastocyst after a few more divisions and this stage contains a fluid filled cavity in the embryo. The blastomeres become arranged and line up into an outer layer of cells called the trophoblast and an inner mass of cells. The fluid filled cavity is called blastocoel.

(d) Implantation of the embryo occurs at this blastocyst stage by the help of trophoblast layer which embeds itself into the uterine endometrium.

23. Explain the inheritance of one gene by Punnett Square ?

➥ Punnett Squre :

➥ The production of gametes by the parents, the formation of the zygotes, the F_1 and F_2 plants can be understood from a diagram called Punnett Square (By Reginald C. Punnett).

➥ It is a graphical representation to calculate the probability of all possible genotypes of offspring in a genetic cross.

➥ The Punnett Square shows,

- TT → Tall (Male) (♂)
- tt → Dwarf (Female) (♀)
- Produced Gametes (T, t)
- Tt → F_1 Progeny (self-pollinated)

➥ The F_1 plant of the genotype Tt when self-pollinated, produces gametes of the genotype T and t in equal proportion.

➥ When fertilisation takes place, the pollen grains of genotype T have a 50 per cent chance to pollinate eggs of the genotype T, as well as of genotype t.

➥ Also pollen grains of genotype t have a 50 per cent chance of pollinating eggs of genotype T, as well as of genotype t. As a result of random fertilisation, the resultant zygotes can be of the genotypes TT, Tt or tt.

➥ From the Punnett square it is easily seen that $1/4^{th}$ of the random fertilisations lead to TT, 1/2 lead to Tt and $1/4^{th}$ to tt.

➥ Though the F_1 have a genotype of Tt, but the phenotypic character seen is 'tail'.

➥ At F_2, 3/4 of the plants are tall, where some of them are TT while others are Tt.

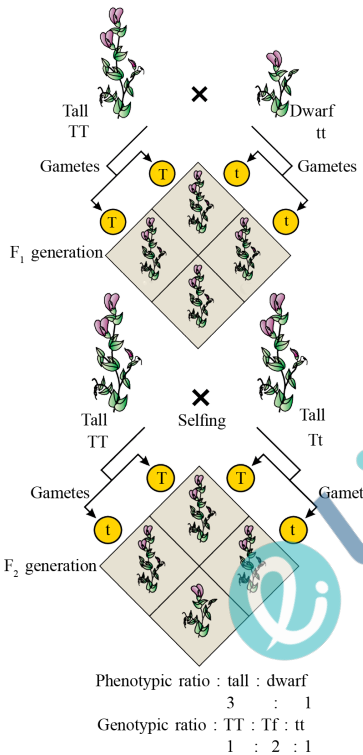
➥ Externally it is not possible to distinguish between the plants with the genotypes TT and Tt. Hence, within the genotypic pair Tt only one character 'T' tall is expressed.

➥ Hence the character T or 'tall' is said to dominate over the other allele or 'dwarf' character.

- It is thus due to this dominance of one character over the other that all the F_1.are tall (though the genotype is Tt) and in the F_2 3/4 of the plants are tall (though genotypically 1/2 are Tt and only 1/4th are TT).

Genotypic ratio	3 : 1 (Tall : Dwarf)
Phenotypic ratio	1 : 2 : 1 (TT : Tt : tt)

- The 1/4 : 1/2 : 1/4 ratio of TT : Tt : tt is mathematically condensable to the form of the binomial expression $(ax + by)^2$, that has the gametes bearing genes T or t in equal frequency of 1/2. The expression is expanded as given below :
- $(1/2T + 1/2t)^2 = (1/2T + 1/2t)\ X\ (1/2T + 1/2t) = 1/4\ TT + 1/2\ Tt + 1/4\ tt$
- Mendel self-pollinated the F_2 plants and found that dwarf F_2 plants continued to generate dwarf plants in F_3 and F_4 generations. He concluded that the genotype of the dwarfs was homozygous - tt.



24.

- Transforming Principle
- In 1928, Frederick Griffith, in a series of experiments with Streptococcus pneumoniae (bacterium responsible for pneumonia), witnessed a miraculous transformation in the bacteria.
- During the course of his experiment, a living organism (bacteria) had changed in physical form.
- When Streptococcus pneumoniae (pneumococcus) bacteria are grown on a culture plate,

  (I) Some produce smooth shiny colonies (S) while others produce rough colonies (R).

  (II) This is because the S strain bacteria have a 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.

S strain ⟶ Inject into mice ⟶ Mice die
R strain ⟶ Inject into mice ⟶ Mice live

- Griffith was able to kill bacteria by heating them.

- He observed that heat-killed S strain bacteria injected into mice did not kill them.

S strain ⟶ Inject into mice ⟶ Mice live (heat-killed)
S strain (heat-killed) ⟶ Inject into mice ⟶ Mice die
+
R strain (live)

- When he injected a mixture of heat-killed S and live R bacteria, the mice died. Moreover, he recovered living S bacteria from the dead mice.
- 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 synthesise a smooth polysaccharide coat and become virulent.
- This must be due to the transfer of the genetic material. However, the biochemical nature of genetic material was not defined from his experiments.

25.

- PCR stands for Polymerase Chain Reaction. In this reaction, multiple copies of the gene (or DNA) of interest is synthesised in vitro.
- There are three main steps of PCR.

(1) Denaturation:

- Desired DNA is denatured by heating at 90- 95°C. The hydrogen bonds which holds two DNA strands are broken down and two stages of DNA separate.

(2) Annealing :

- In this step primers which are oligonucleotides, the new DNA nucleotide will be added.
- Primer is a complementary to the one end of target stand (3' end) but overlapping the opposite strand
- This mixture is allowed at low temperature (50- 60°C), so primers annealed to the strands.

(3) Extension :

- *DNA polymerase* (isolated from a bacterium, *Thermus aquaticus*), which remain active during the high temperature induced denaturation of double stranded DNA.
- Polymerase enzyme synthesise new strand in 5' → 3' direction.
- If the process of replication of DNA is repeated many times, the segment of DNA can be amplified to approximately billion times, i.e., 1 billion copies are made.

(For diagram see Q.No.35)

26.

- (i) The cotyledons : The cotyledons of the embryo are simple structures, generally thick and swollen due to storage of food reserves (as in legumes).
- Mature seeds may be non-albuminous or ex-albuminous.
  - Non albuminous seeds : Non albuminous seeds have no residual endosperm as they are completely consumed during embryo development (e.g., pea, groundnut).
  - Albuminous seeds : Albuminous seeds retain a part of endosperm as they are not completely used up during embryo development (e.g., wheat, maize, barley, castor).
  - Perisperm : Occasionally, in some seeds such as black pepper and beet, remnants of nucellus are also persistent. This residual, persistent nucellus is the Perisperm.
- (ii) Integuments : Integuments of ovules harden as tough protective seed coats.
- (iii) Micropyle : The micropyle remains as a small pore in the seed coat. This facilitates the entry of oxygen and water into the seed during germination.

27.

- (i) Avoid undue peer pressure - Every child has his/her own choice and personality, which should be respected and nurtured. A child should not be pushed unduly to perform beyond his/her threshold limits; be it studies, sports or other activities.
- (ii) Education and counseling - Educating and counseling him/her to face problems and stresses and to accept disappointments and failures as a part of life. It would also be worthwhile to channelise the child's energy into healthy pursuits like sports, reading, music, yoga and other extracurricular activities.
- (iii) Seeking help from parents and peers
  - Help from parents and peers should be sought immediately so that they can guide appropriately.
  - Help may even be sought from close and trusted friends. Besides getting proper advice to sort out their problems, this would help youth to vent their feelings of anxiety and guilt.
- (iv) Looking for danger signs - Alert parents and teachers need to look for and identify the danger signs discussed above.
  - Even friends, if they find someone using drugs or alcohol, should not hesitate to bring this to the notice of parents or teachers in the best interests of the person concerned. Appropriate measures would then be required to diagnose the malady and the underlying causes.
  - This would help in initiating proper remedial steps or treatment.
- (v) Seeking professional and medical help - A lot of help is available in the form of highly qualified psychologists, psychiatrists, and de-addiction and rehabilitation programs to help individuals who have unfortunately got into the quagmire of drug/alcohol abuse. With such help, the affected individual with sufficient efforts and will power, can get rid of the problem completely and lead a perfectly normal and healthy life.