PRACTICE PAPER-1 (SOLUTIONS)

CLASS: XII

SUBJECT : BIOLOGY

SOLUTIONS

SECTION – A

1. **(c)** Synergids **[1]**

2. **(b)** (i), (ii) and (iv) **[1]**

3. **(d)** phenotypes - 4; genotypes – 9 **[1]**

4. **(b)** Photosynthesis of blue green algae **[1]**

5. **(a)** 5'-AUGAAUG-3' **[1]**

6. **(c)** Health is a state of complete physical, mental, and social well-being. **[1]**

7. **(b)** (ii) and (iv) **[1]**

8. **(a)** Labia minora **[1]**

9. **(b)** Methane, hydrogen sulphide and CO_2 **[1]**

10. **(c)** It will increase **[1]**

11. **(b)** a-ii, b-iii, c-i, d-iv **[1]**

12. **(c)** Mostly located in the tropics **[1]**

13. **(b)** Both A and R are true and R is not the correct explanation of A. **[1]**

14. **(a)** Both A and R are true and R is the correct explanation of A. **[1]**

15. **(a)** Both A and R are true and R is the correct explanation of A. **[1]**

16. **(c)** A is true but R is false. **[1]**

SECTION – B

17.(a) Blastocyst

(b) (A) is trophoblast. The trophoblast layer gets attached to endometrium and later forms extraembryonic membrane namely chorionic villi. **[1+1=2]**

18. Colourblind is a X linked recessive disorder. Male have higher chances of getting affected in comparison to females because

Male have only one X with Y chromosome and female have XX chromosome, thus for a female to get affected by colourblindness, she has to have the mutate gene on both the X chromosome while male can be affected, if they carry it on the single X chromosome.

It can be concluded that females have very less probability of getting this disease as compare to male.

Female will be colourblind only when either both parents are affected or male affected and female is carrier, while males can be colourblind even if female is carrier and male is normal.

[2]

19. (a) **Passive immunisation :** When ready-made antibodies are introduced into the body, it is called as **passive immunisation**. It provides quick immune response in body.

(b) **Anti-histamines :** These are the chemicals which are given **against allergic reactions.**

(c) **Colostrum:** It is the yellow fluid produced during the initial days of lactation. It is rich in antibodies and is necessary to develop resistance in a new born baby.

(d) **Cytokinin Barrier :** These are the **glycoproteins** which protect non-infected cells from further viral infection. **[½+½+½+½=2]**

20. (a) e.g. EcoRI comes from Escherichia coli RY13.

The first letter of the name comes from the genus,

The second two letters comes from the species of the prokaryotic cell from which they were isolated.

Fourth letter name of strain of bacteria. In EcoRI the letter 'R' is derived from the name of strain.

Roman numbers following the names indicated the order in which the enzymes were isolated from that strain of bacteria.

(b) *Thermus aquaticus*, it remains active during the high temperature, (induced to denature double stranded DNA) and catalyses polymerisation of DNA. **[1+1=2]**

21. (a) Figure A show a pollinator (bee) on a flower. The association between pollinator insect and plant is termed as mutualism.

(b) Figure B shows an association of predation. Predation refers to an interaction between two organisms (predator and prey) where there is a flow of energy from one to another. **[1+1=2]**

OR

Human beings can be placed at three trophic level in a food chain, if human being is vegetarian than included in primary consumer (herbivore) while in case of non-vegetarian this is secondary consumer (carnivore), in case both they are omnivore and placed at top consumer. **[2]**

SECTION – C

22.(a) This is an adaptation to provide assured, nutrition to the developing embryo.

(b) In coconut, Primary Endosperm Nucleus (PEN-3n) undergoes successive nuclear divisions, give rise to free - nuclear endosperm known as coconut water, white kernel is the cellular endosperm, provides nourishment to the growing embryo. **[3]**

23.(a) Mitochondria:- Middle piece of sperm contains large number of mitochondria that provides energy needed for the movement.

(b) **Hydrolytic enzyme :-** Acrosome present in the cap of sperms contain hydrolytic enzymes which help sperm to penetrate the egg. These enzymes break down the outer membrane of the ovum called the Zona pellucida, allowing the haploid nucleus in the sperm cell to join with the haploid nucleus in the ovum.

(c) **Tail :-** Tail of perm helps in propelling or swims the sperm cell forward to meet the egg.

[1+1+1=3]

24.(a)(i) If both strands act a template, they would code for RNA molecule with different sequences (Remember complementarity does not mean identical), and in turn, if they code for proteins, the sequence of amino acids in the proteins would be different. Hence, one segment of the DNA would be coding for two different proteins, and this would complicate the genetic information transfer machinery.

(ii) The two RNA molecules if produced simultaneously would be complementary to each other, hence would form a double stranded RNA. This would prevent RNA from being translated into protein.

(b) With the coding strand. **[2+1=3]**

25. Life cannot be originated in the present day atmosphere because :-

(i) The temperature of present day atmosphere is much less than that of primitive atmosphere .

(ii) The present day atmosphere is oxidizing and not reducing due to presence of oxygen.

[2+1=3]

26. (a) It is chemical structure of **Morphine.**

(b) By **snorting and injection.**

(c) Central nervous system **(CNS), gastrointestinal tract.** **[1+1+1=3]**

OR

(a) Bone marrow

(b) The lymphocytes produced migrate to secondary lymphoid organs like spleen, lymph nodes, etc. They trap the microorganism thereby activating the lymphocytes present in the lymph nodes and produce an immune response. **[1+2=3]**

27. (a) Tasmanian wolf evolved by the process of adaptive radiation. It is the process of evolution of different species in a given geographical area starting from a point and literally radiating to other areas of geography (habitats).

(b) Examples of animals : Tiger cat/banded ant eater/Marsupial rat. Convergent evolution has resulted in evolution of wolf and Tasmanian wolf.

(c) Wolf is a placental mammal, whereas Tasmanian wolf is a marsupial mammal. **[1+1+1=3]**

28. (a) It differ from previous episodes due to rate if its extinction .The current species extinction rate are estimated near 100 to 1000 more faster than in the pre human time.

(b) Human activities

(c) Reforestation, Sustainable utilization of resources, Ex-situ and In-situ conservation of biodiversity. **[1+1+1=3]**

SECTION – D

29.(a) The diagnostic test for AIDS is Enzyme Linked Immuno-Sorbent Assay (ELISA).

(b) Qualified doctors guides students and their parents about transmission HIV. It does not transmit through touching, hand shaking, playing and taking food and water with infected person.

(c) The way of transmission of HIV- infection.

Sexual contact with infected person.

By transfusion of contaminated blood and blood products.

By sharing infected needles as in the case of intravenous drug abusers.

From infected mother to her child through placenta.

OR

(c) The programs has started by WHO to prevent the spreading of HIV infection.

Making blood (from blood banks) safe from HIV.

Ensuring the use of only disposable needles and syringes in public and private hospitals and clinics.

Free distribution of condoms and advocating safe a sex.

Promoting regular check-ups for HIV in susceptible populations, are some such steps taken up.

[1+1+2=4]

30. (a) DNA being chemically and structurally more stable is a better genetic material.

(b) They are complementary and antiparallel to each other .

(c) (A) Cytosine, (B) Thymine, (C) Cytosine, (D) Uracil

OR

(c) Cytosine 20% , therefore guanine equal to 20%

According to chargaff's rule

A+T = 100 – (G+C)

A+T = 100 – (20 +20)

A+T = 100 – 40 = 60

Since both A and T are equal amounts

A = T = 60/2 = 30 % **[1+1+2=4]**

31.(a) A-Sperm, B- Cells of corona radiate, C-Previtelline space, D-Zona Pellucida.

(b) Induce completion of meiotic division of the secondary oocyte, formation of second polar body and a haploid ovum.

(c) It ensures the entry of only one sperm into ovum.

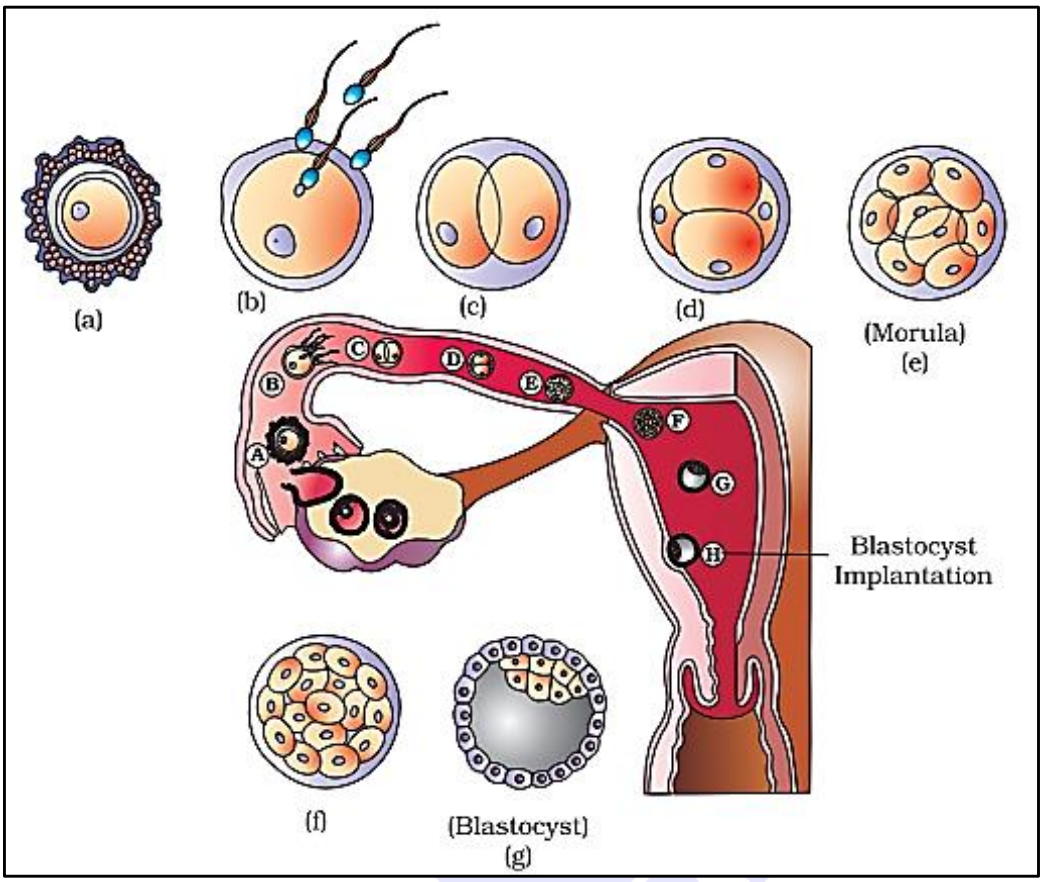
(d) Enzymes of acrosome.

(e) Ampulla of the fallopian tube. **[1+1+1+1+1=5]**

OR

The mitotic division starts as the zygote moves through the isthmus of the oviduct called cleavage towards the uterus and forms 2, 4, 8, 16 daughter cells called blastomeres.

- The embryo with 8 to 16 blastomeres is called a morula. The morula continues to divide and transforms into blastocyst as it moves further into the uterus.
- The blastomeres in the blastocyst are arranged into an outer layer called trophoblast and an inner group of cells attached to trophoblast called the inner cell mass.
- The trophoblast layer then gets attached to the endometrium and the inner cell mass gets differentiated as the embryo.
- After attachment, the uterine cells divide rapidly and covers the blastocyst. As a result, the blastocyst becomes embedded in the endometrium of the uterus. This is called implantation and it leads to pregnancy.



[3+2=5]

32.(a) According to base complementary rules,

(i) The sequence of its complementary strand is 5'-TTACGTCGATAATCC-3'

(ii) The sequence of mRNA is 5'-GGAUUAUCGACGUAA-3' RNA uses the base uracil (U) rather than thymine (T). So, in RNA the base pairs are Adenine (A) pairs with uracil (U) Guanine (G) pairs with cytosine (C).

(b) The important functions of ribosome during translation are as follows.

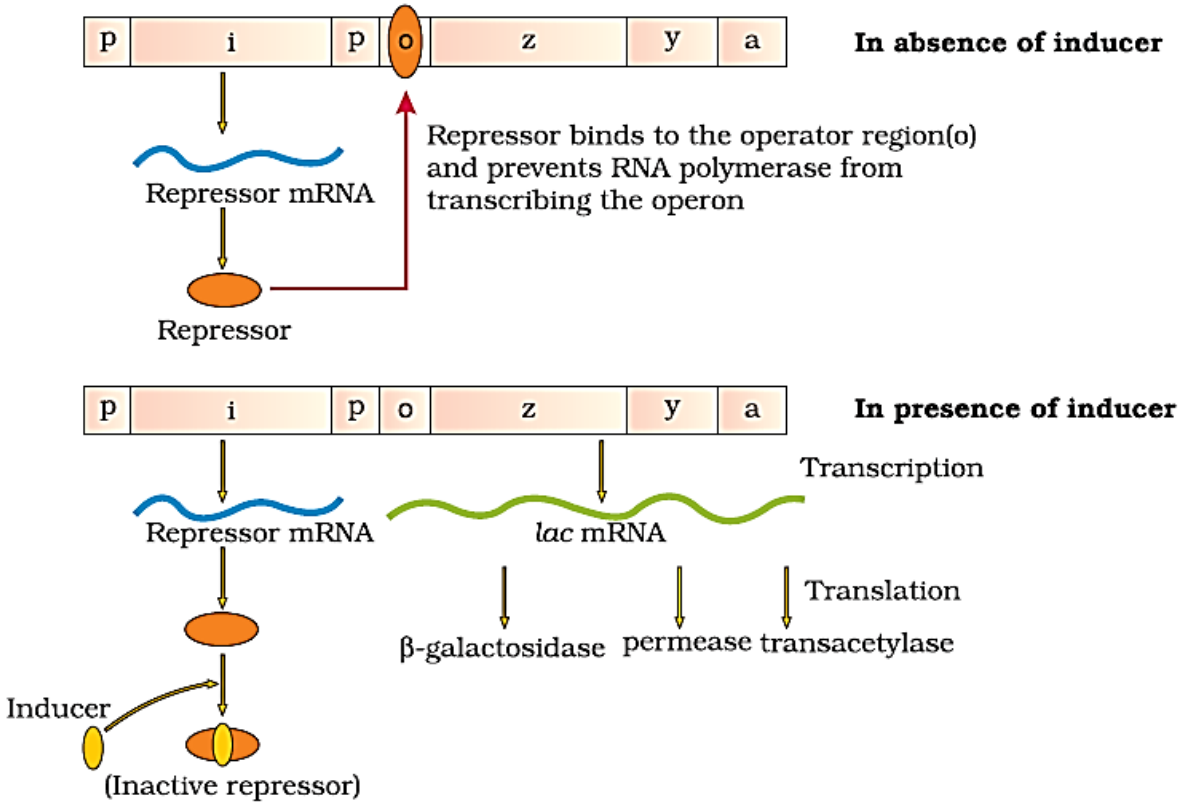
(i) Ribosome acts as the site where protein synthesis takes place from individual amino acids. It is made up of two subunits. The smaller subunit comes in contact with mRNA and forms a protein synthesising complex whereas the larger subunit acts as an amino acid binding site.

(ii) Ribosome acts as a catalyst for forming peptide bond. For example, 23S rRNA in bacteria acts as a ribozyme. **[2+3=5]**

OR

(a) The repressor of the Lac-operon is synthesised (all-the-time – constitutively) from the i gene. The repressor protein binds to the operator region of the operon in absence of the inducer, and prevents RNA polymerase from transcribing the operon.

(b) In the presence of an inducer, (lactose) the repressor is inactivated by interaction with the inducer, this allows RNA polymerase access to the promoter and transcription proceeds.



[2½+2½ = 5]

33.(a) Tumour inducing

(b) It is transferred DNA.

(c) When the harmful Ti gene remove from the plasmid, now this plasmid is known as disarmed Ti plasmid.

(d) It is because it has the natural ability to integrates its plasmid genes into the plant genomes. It can deliver a piece of T-DNA in the plant genome.

(e) (i) High transformation efficiency

(ii) Transgenic crops obtained have better fertility percentage

(iii) Relatively large length DNA segment can be transferred. **[1+1+1+1+1=5]**

OR

(a) The Bt toxin protein exist as inactive protoxins in bacteria.

(b)(i) Lepidopterans - Tobacco budworm, Army worm, Cotton bollworm.

(ii) Coleopterans - Beetles

(iii) Dipterans - Flies, Mosquitoes.

(c) It is converted into an active form of toxin due to the alkaline pH of the gut of insects which solubilise the crystals.

(d) It control the cotton bollworms.

(e) *Bacillus thuringiensis* produces insecticidal toxin. Bt toxin gene has been cloned from the bacteria and been expressed in plants to provide resistance to insects without the need for insecticides; in effect created a bio-pesticides. **[1+1+1+1+1=5]**