PRACTICE PAPER-2 (SOLUTIONS)

CLASS: XII

SUBJECT : BIOLOGY

SECTION – A

1. (a) Parthenocarpy **[1]**

2. (b) ZIFT **[1]**

3. (d) Independent assortment **[1]**

4. (b) Sporozoite **[1]**

5. (d) All of the above **[1]**

6. (c) Phosphate group **[1]**

7. (d) All of the above **[1]**

8. (a) Bollworm **[1]**

9. (c) Amazon rain forest **[1]**

10. (d) Both (A) and (B) **[1]**

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

12. (a) Species **[1]**

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

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

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SECTION – B

17. (a) ovulation- f , stage -secondary oocyte. **[1+1=2]**

(b) Estrogen and luteinising hormone (LH) **[1+1=2]**

18. (a) Klinefelter's Syndrome

(b) Turner's Syndrome **[1+1=2]**

19. (a) The source plant of heroin drugs is poppy plant *(Papaver somniferum)*.

(b) Heroin is a depressant and slows down the body functions. **[1+1=2]**

20. (a) Exonuclease removes nucleotides from the ends of DNA whereas endonuclease cuts at specific positions within DNA at specific positions.

(b) Restriction endonuclease recognises and cuts specific palindromic nucleotide sequences in the DNA. **[1+1=2]**

21. (i) A — Expanding pyramid B — Stable pyramid C — Declining pyramid

(ii) Stable pyramid is ideal for human population because it maintains the stability in all population phases.

OR

(a) The specific places occupied by an organism in the food chain is called trophic level. **[1+1=2]**

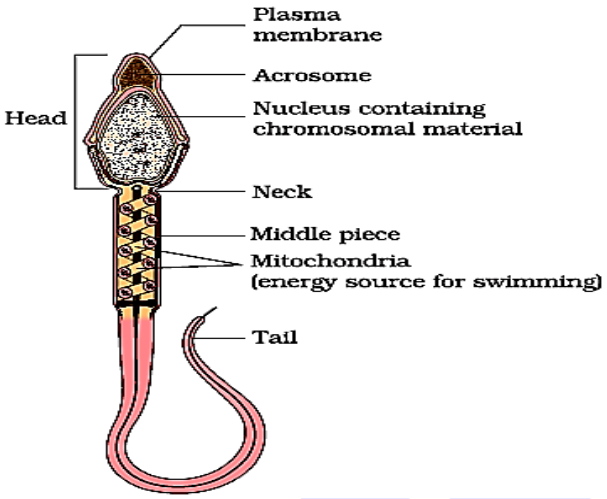
(b) The first trophic level is comprised by the producers which trap solar energy to convert it into chemical bond energy of food. They serve as food for subsequent trophic levels.

SECTION – C

22. (a) Sporopollenin : Exine of pollen grains. It protects the pollen grains from high temperature, strong acids and alkali, enzymes and adverse conditions. **[2+1=3]**

(b) Generative Cells: These are present in pollen grains. These give rise to two male gametes.

23.



(i) Acrosome: Contains hydrolytic enzymes that help in dissolving membranes of the ovum for fertilisation.

(ii) Middle piece: Contains a number of mitochondria that provide energy for the movement of the tail that facilitate sperm motility **[1+1+1=3]**

24. (i) a is AUG and b is UAA/UAG/UGA

(ii) AUG codes for methionine (initiation codon).
UAA/UAG/UGA do not code for any amino acid, i.e., stop or terminating codons.

(iii) Amino acids are activated in the presence of ATP and linked to (cognate) t-RNA. **[1+1+1=3]**

25. The order of evolution on the earth is:

Ramapithecus → Australopithecus → Homo habilis

Ramapithecus were hairy and walked–like gorilla and chimpanzees. They were more man like.

Australopithecus hunted with stone weapons and ate fruit.

Homo habilis had a brain capacity 650-800 cc and probably did not eat meat. **[1+2=3]**

26. (a) Ringworm is caused by fungi *Trichophyton and Epidermophyton /Microsporum.*

(b) Symptom- Appearance of dry, scaly lesions on various parts of the body such as skin, nails and scalp are the main symptoms of the disease.

These lesions are accompanied by intense itching. Heat and moisture help these fungi to grow, which makes them thrive in skin folds such as those in the groin or between the toes. **[1+2=3]**

OR

(i) *Wuchereria bancrofti, Wuchereria malayi.*

(ii) Inflammation of the lymphatic vessels of the lower limbs/inflammation of the genital organs/ gross deformity of the lower limbs / deformity of the genital organs.

(iii) Through the bite of female (Culex) mosquito **[1+1+1=3]**

27. (a) He would have loaded the samples near end A: in the wells.

(b) The DNA fragments separate (resolve) according to their size through sieving effect provided by the agarose gel. Hence, the smaller the fragment size, the farther it moves.

(c) After staining the DNA with ethidium bromide followed by exposure to UV radiations the DNA bands appear coloured. **[1+1+1=3]**

28. (i) Parasitism

(ii) Mutualism

(iii) Commensalism **[1+1+1=3]**

SECTION – D

29. (a) Common symptoms of AIDS.

- Rapid weight loss.
- Dry Cough
- Memory loss, depression and neurological disorders.
- Pneumonia
- Recurring fever

(b) Syphilis and AIDS.

(c) (i) Use of disposable needles and syringes.

(ii) Seeking treatment immediately after suspected HIV exposure.

(iii)Generating awareness among people about AIDS and its mode of transmission.

OR

(c) AIDS can be diagnosed by ELISA test (Enzyme Linked Immune-Sorbent Assay) PCR-Test, Western blotting, etc. **[1+1+2=4]**

30. (a) Anaphase-I of Meiosis-I.

(b) It is false, both chromosomes as well as genes segregate at the time of gamete formation such that only one of each pair is transmitted to a gamete.

(c) According to this theory, genes are the units of heredity and are found in the chromosomes. Thus, chromosomes are the vehicles of genetic heredity.

OR

(c) Grown in simple synthetic medium, complete the life cycle in two weeks / short life cycle, single mating produce more progeny, dimorphism, many heritable variations / easy to handle. **[1+1+2=4]**

SECTION – E

31. (i) (a) Corpus luteum : Progesterone.

Placenta : hCG(Human chorionic gonadotropin) ,Progesterone, hPL/human placental lactogen, Estrogen

(b) Follicular phase : LH/FSH ,estrogen by growing follicles.

Parturition : Oxytocin

(ii) (a) Pregnancy, gestation.

(b) Menstruation,proliferative phase,ovulatory phase,follicular phase. **[5]**

OR

(i) Spermatogenesis is the process of the production of sperms from the immature germ cells in males. It take place in seminiferous tubules.

(ii) During spermatogenesis a diploid spermatogonium (male germ cell) divides by mitosis and produces primary spermatocyte (diploid). This primary spermatocyte undergoes first meiotic division (meiosis-I), which is a reductional division to from two equal haploid secondary spermatocytes. Each secondary spermatocyte then undergoes second meiotic division (meiosis-II) to form two equal haploid spermatids. Hence, a diploid spermatogonium produces four haploid spermatids.

(iii) There spermatids are then transformed into spermatozoa (sperm) by the process called spermiogenesis.

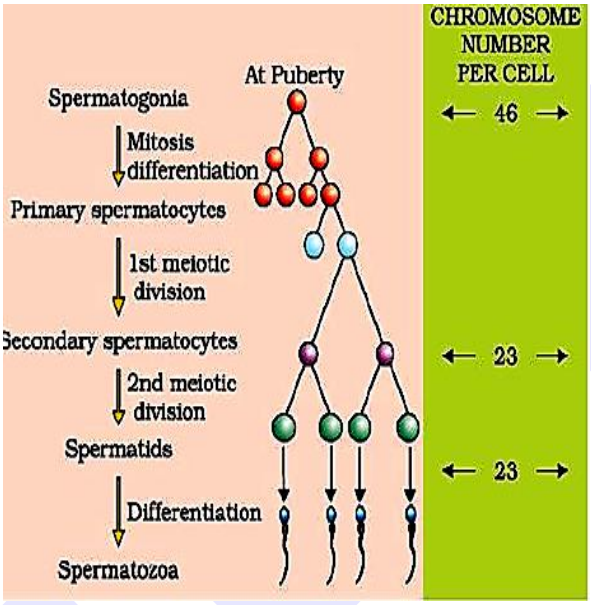


Fig-Schematic representation of Spermatogenesis

[3+2=5]

32.(a) Plasmodium falciparum causes malaria.

(b) It enters into human body in sporozoite form.

(c) Life cycle of Malaria parasite in human body. Is as follows :

The malarial parasite requires two hosts - human and Anopheles, to complete their life cycle.

(i) Life cycle of Plasmodium starts with inoculation of sporozoites (infective stage) through the bite of infected female Anopheles mosquitoes.

(ii) The parasite is initially multiplied within the liver cells and then attack the red blood cells (RBCs) resulting in their rupture.

(iii) There is release of a toxic substance called haemozoin from the rupture RBCs which is responsible for the chill and high fever.

(iv) From the infected human, the parasite enters into the body of Anopheles mosquito during biting and sucking blood.

(v) Further development takes place in the body of Anopheles mosquitoes.

(vi) The female mosquito takes up gametocytes with the blood meal.

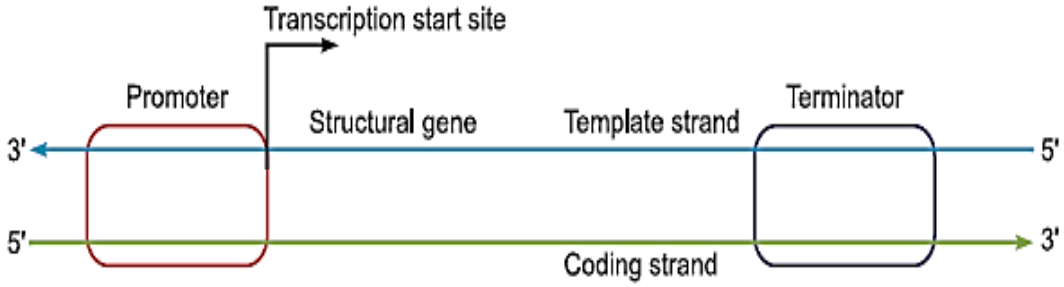
(vii) Formation of gametes and fertilization takes place in the intestine of mosquito.

(viii) The zygote develops further and forms thousands of sporozoites which migrates into the salivary gland of mosquito. When the mosquito bite another human, sporozoites are injected. **[1+1+3=5]**

OR

(A) RNA polymerase II.

(B) Schematic structure of a transcription unit:



(i) Promoter: It is the binding site for RNA polymerase for initiation of transcription.

(ii) Structural gene: It codes for enzyme or protein for structural functions.

(iii) Terminator: It is the region where transcription ends. **[1+2+2=5]**

33.(a) Eli Lilly

(b) Pro-insulin have addition 'C' peptide chain while its is absent into mature insulin.

(c) Not, because it is a proteinaceous hormone it would be digested in the digestive tract.

(d) E.coli (Bacteria)

(e) Two short polypeptide chains of insulin are linked together by disulphide bridges.

1+1+1+1+1=5]

OR

(a) ADA Deficiency

(b) A possible permanent cure would be gene therapy, if it is detected as early embryonic stage.

(c) Gene therapy is a collection of methods that allows correction of a gene defect that has been diagnosed in a child/embryo.

(d) As enzyme replacement therapy does not cure the disease completely, it requires periodic treatment. **[1+1+2+1=5]**