

SAHODAYA PRE BOARD EXAMINATION (TERM I) 2021-22

CLASS XII

BIOLOGY

BIOLOGY (SET 1)

Time: 90 Minutes

DATE: 29/10/2021

General Instructions:

1. The Question Paper contains three sections.
2. Section A has 24 questions. Attempt any 20 questions.
3. Section B has 24 questions. Attempt any 20 questions.
4. Section C has 12 questions. Attempt any 10 questions.
5. All questions carry equal marks.
6. There is no negative marking.

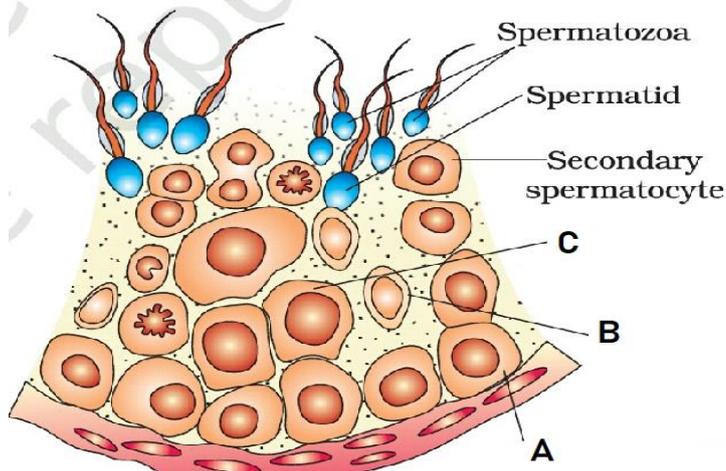
SECTION - A

Section – A consists of 24 questions. Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

1. When any Angiosperm reproduces with its flower,
 - A. It brings about seed formation
 - B. It brings about fruit formation
 - C. It brings about variation always
 - D. It brings about variation sometimes
2. Pollination does not guarantee the transfer of 'right type' of pollen because,
 - A. Pollens can be shed in 2 or 3cell stage
 - B. Some pollens land on parts other than stigma
 - C. Mostly it is brought about by other agents
 - D. Pollens have a viability period
3. In monocot seeds, the remaining endosperm is:
 - A. Stored in scutellum
 - B. Consumed during fruit formation
 - C. Enclosed within the aleurone layer
 - D. Meant for biotic pollinators
4. A bilobed anther will have
 - A. one sporogenous tissue, one tapetum and 4 wall layers
 - B. Two sporogenous tissue, two tapetum and 4 wall layers
 - C. two sporogenous tissue, two tapetum and 3 wall layers
 - D. four sporogenous tissue, four tapetum and 3 wall layers
5. The volume of coconut water changes as it ages because,
 - A. The ability to produce water decreases
 - B. Volume of the water is based on the genetic composition
 - C. The liquid endosperm gets cellularized
 - D. The liquid endosperm gets acellularized

6. Double fertilization occurs in the
- Central cell and egg apparatus
 - Central cell and antipodal cells
 - Egg cell and antipodal cells
 - Central cell and egg cell
7. A sperm in the ampullary isthmic junction is not able to bring about fertilization. The reason/s could be:
- Sperm motility is less
 - Sperm has not reached zona pellucida
 - Sperm count is less
 - Acrosomal enzymes are inefficient
- (i) & (ii)
 - (ii) & (iii)
 - (iii) & (iv)
 - (ii) & (iv)

Observe the diagram carefully and answer the questions that follow. (Q.No. 8 to Q.No.10)



8. The cells labelled as A, B & C are in the order
- Sertoli cells, spermatogonia and Leydig cells
 - Spermatogonia, Sertoli cells, and primary spermatocytes
 - Spermatogonia, primary spermatocytes and Sertoli cells
 - Spermatogonia, Leydig cells and Sertoli cells
9. This process requires:
- 34.5 °C – 37.5 °C
 - 34.5 °C – 37 °C
 - 36.5 °C – 38.5 °C
 - 36 °C - 38 °C
10. This process is initiated by:
- Significant increase in the secretion of testosterone
 - Significant increase in the secretion of GnRH
 - Attainment of puberty
 - All of these

11. When a trait is expressed by 3 different alleles, gametes can be produced with:
 - A. 6 different combinations
 - B. 3 recessive and 3 dominant combinations
 - C. 2 dominant, 2 recessive and 1 intermediate combination
 - D. 9 different combinations

12. If a plant, heterozygous for tallness is selfed, F₂ generation will have:
 - A. All tall plants
 - B. all dwarf plants
 - C. both tall and dwarf plants in the ratio 1:2:1
 - D. both tall and dwarf plants in the ratio 3:1

13. Map distance of genes on chromosome is calculated by
 - A. Non-cross over percentage
 - B. Recombination frequency of each gene locus
 - C. Cross over percentage
 - D. Number of mutant genes

14. F₂ generation is obtained by
 - A. Crossing of F₀ and F₁
 - B. Crossing of F₁ and F₁
 - C. Selfing of F₂
 - D. Selfing of F₁

15. Sickle cell anaemia is due to the mutation caused by
 - A. Insertion of a nitrogenous base in the 5th aminoacid position
 - B. deletion of a nitrogenous base in the 6th aminoacid position
 - C. substitution of a nitrogenous base in the 5th aminoacid position
 - D. substitution of a nitrogenous base in the 6th aminoacid position

16. Each gametes carry
 - A. recessive allele & dominant allele
 - B. a set of sex chromosomes
 - C. Only one of the alleles
 - D. None of these

17. A purine base is paired with a pyrimidine base in the DNA strand because,
 - A. Purines are smaller and pyrimidines are larger
 - B. Purines are larger and pyrimidines are smaller
 - C. Maintains the distance between the two strands
 - D. Maintains the anti-parallel nature of the two strands

18. Which among the following statements is not appropriate in the context of DNA structure?
 - A. Phosphate group is attached to the 5th carbon of the pentose sugar
 - B. Nitrogenous base is attached to the 1st carbon of the pentose sugar
 - C. Nitrogenous base is attached to the ribose sugar by N-glycosidic linkage

- D. All of these
19. Whenever a DNA is involved in the synthesis of a RNA strand,
- A. It is meant for transcription
 - B. It is meant for translation
 - C. It is meant for transporting to the cytoplasm
 - D. None of these
20. Which of the following scientists ultimately proved that DNA is the genetic material?
- A. Avery, Macleod and McCarty
 - B. Griffith
 - C. Meselson & Stahl
 - D. Hershey & Chase
21. Synthesis of RNA on a DNA strand is called transcription because:
- A. Only one of the strands is copied
 - B. Only a part of the strand is copied
 - C. RNA strand varies in its sugar and a nitrogenous base component
 - D. All of these
22. The distinguishing feature between genes and chromosomes is:
- A. Both occur in pairs
 - B. Each gene can assort independently of each other
 - C. Each chromosome can assort independently of each other
 - D. Neither genes nor chromosomes can assort independently of each other
23. In *Antirrhinum* species,
- A. Only red and white colour flowers can be seen in a plant
 - B. Only pink and white colour flowers can be seen in a plant
 - C. Either red/ white/ pink colour flowers can be seen in a plant
 - D. All three colours can be seen in some plants
24. The components of a transcription unit are:
- A. Promoter at the 3' end of the coding strand and terminator at its 5' end flanking the structural gene
 - B. Promoter at the 5' end of the coding strand and terminator at its 3' end flanking the structural gene
 - C. Depends on which side the structural gene is located
 - D. None of these

SECTION - B

Section - B consists of 24 questions (Q. No.25 to 48). Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

Question No. 25 to 28 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true and R is not the correct explanation of A
- C. A is true but R is false
- D. A is False but R is true
- E. Both A & R are false

25. **Assertion:** Lactational amenorrhoea is a temporary contraceptive method

Reason: ovulation does not occur during the period of intense lactation

- A.
- B.
- C.
- D.
- E.

26. **Assertion:** ICSI technique can be used to develop embryo invitro.

Reason: This process can be performed only after the ovum is taken out of the ovary

- A.
- B.
- C.
- D.
- E.

27. **Assertion:** Copper releasing IUDs work by inhibiting ovulation

Reason: copper can inhibit gametogenesis

- A.
- B.
- C.
- D.
- E.

28. **Assertion:** Amniocentesis is the test performed for determining the sex of the developing embryo.

Reason: Amniotic fluid has the embryonic cells.

- A.
- B.
- C.
- D.
- E.

29. In Vallisneria,

- A. Pollens are released on the water surface as they are lighter
- B. Pollens are released in the water but reach the water surface
- C. Flowers are bisexual and produce pollen and stigma
- D. Pollination can occur only when there is a water current

30. Choose the odd one out:

Vegetative cell, intine, synergids, germ pore

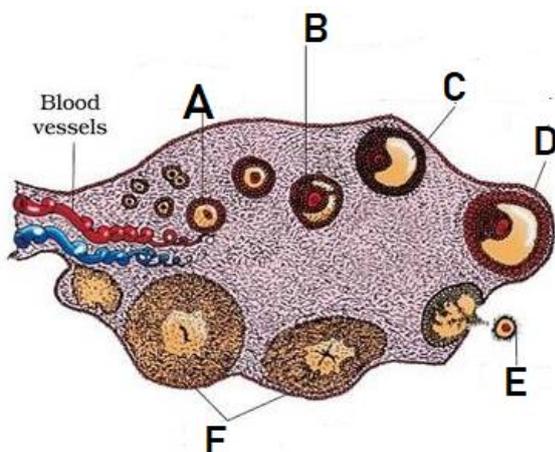
- A. Germ pore
- B. Synergids
- C. intine
- D. Vegetative cell

31. The flowers in the following illustration



- A. Encourages wind pollination
- B. Encourages insect pollination
- C. Discourages self-pollination
- D. Discourages cross-pollination

Observe the diagram carefully and answer the questions that follow. (Q.No.32 to Q.No. 35.)



32. The correct labelling of A, B, C and D are:

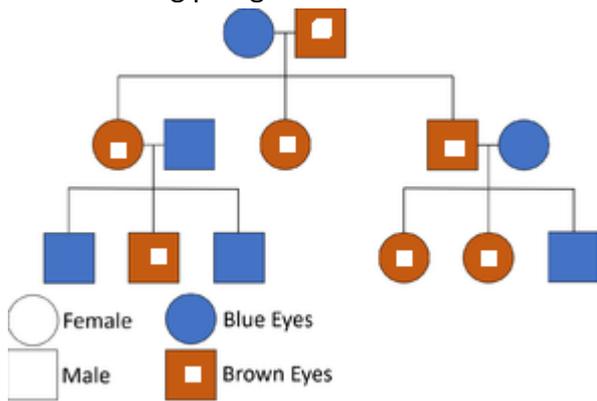
- A. Oogonia, primary follicle, secondary follicle, tertiary follicle
- B. Oogonia, primary follicle, secondary follicle, graffian follicle
- C. Primary follicle, secondary follicle, tertiary follicle, graffian follicle
- D. Primary oocyte, secondary oocyte, tertiary oocyte, mature ovum

33. The structure labelled as E:

- A. Is formed after first meiotic division
- B. Is formed after second meiotic division

- C. Is the ovum with haploid chromosomes with half the DNA content
 - D. Is the ovum with diploid chromosomes with double the DNA content
34. Which of the following statements is not correct about the structure E?
- A. It is formed by the remnants of graffian follicle
 - B. It is formed once pregnancy occurs
 - C. It secretes progesterone
 - D. It is needed to maintain pregnancy
35. The formation of A, B, C and D are influenced by:
- A. FSH and LH
 - B. Oestrogen and LH
 - C. Oestrogen and FSH
 - D. Oestrogen, FSH and LH
36. The evidence for independent assortment by the dihybrid cross between yellow -round seeded plants and green -wrinkled seeded plants came from:
- A. The appearance of both yellow and green seeds in F1
 - B. The appearance of both round and wrinkled seeds in F1
 - C. The appearance of round- green and yellow- wrinkled seeds in F2
 - D. The appearance of round- yellow and green wrinkled seeds in F2
37. In a heterozygous dominant organism,
- A. The trait will depend on the functioning modified allele
 - B. The trait will depend on the functioning unmodified allele
 - C. The trait will depend on the non-functioning modified allele
 - D. All of these
38. When a modified allele produces a normal or less modified enzyme, it means:
- A. The modified allele is same in composition as the unmodified allele
 - B. The modified allele is equivalent in function to the unmodified allele
 - C. They will produce the similar phenotypes
 - D. They will produce varied phenotypes
39. A person has two different types of RBCs in his blood. It can be due to
- (i) Two different types of sugar polymers on the plasma membrane of his cells
 - (ii) Two different types of sugar polymers on the plasma membrane of the RBCs
 - (iii) Some RBCs may have sugar polymers and some may not have
 - (iv) Both types may or may not have sugar polymers
- The correct reason would be:
- A. (i) & (ii)
 - B. (ii) & (iii)
 - C. (iii) & (iv)
 - D. (i) & (iv)

40. The following pedigree chart shows the inheritance pattern of blue and brown eyes.



From the above pedigree chart, we can infer that:

- A. Males generally have blue eyes compared to females
 - B. The gene for eye colour is located in the X chromosomes
 - C. Blue eye colour is dominant, and brown eye colour is recessive
 - D. Blue eye colour is recessive, and brown eye colour is dominant
41. Morgan did not get the ratio of 9:3:3:1 in the dihybrid cross performed on *Drosophila* because:
- A. The genes controlling the two traits were located in the sex chromosomes
 - B. The genes controlling the two traits were located on the same chromosome
 - C. One gene was dominant and the other recessive
 - D. Both genes were recessive
42. The specific components and the linkage between the components that form deoxyadenosine are:
- A. Pentose sugar linked to adenosine with N acetyl glycosidic bond and to phosphate with phosphodiester bond
 - B. Pentose sugar linked to adenosine with N acetyl glycosidic bond
 - C. Deoxy ribose sugar linked to adenine with N acetyl glycosidic bond and to phosphate with phosphodiester bond
 - D. Deoxy ribose sugar linked to adenine with N acetyl glycosidic bond
43. The two strands of DNA are antiparallel because:
- A. They have constrictions at certain points
 - B. The orientation of deoxyribose is different in both the strands
 - C. Phosphates are linked to ribose sugar in one strand and to deoxyribose on the other
 - D. All of these
44. Some amino acids are coded by more than one codon because:
- A. some aminoacids are needed in large quantities
 - B. they are essential aminoacids
 - C. the genetic code is a triplet code formed out of 4 nitrogenous bases for 20 aminoacids
 - D. the genetic code is degenerate
45. Identify the wrong statement from the following:

- A. haploid content of human DNA is 1.1 m long
 - B. based on Erwin Chargaff's data, Watson & Crick proposed complementary base pairing
 - C. in a nucleotide nitrogenous base is added to the pentose sugar
 - D. the model of DNA replication was first proposed by Watson & Crick.
46. Haemophilia does not affect females compared to males because:
- A. The gene for haemophilia is located in the Y chromosome
 - B. Females are homogametic and effect of recessive genes are less
 - C. Males are homogametic and effect of recessive genes are more
 - D. X chromosomes carry more number of genes than Y chromosomes
47. Variations in the genetic makeup of an organism undergoing asexual reproduction is mainly due
- A. Mutation
 - B. Genetic recombination
 - C. Mutation and Genetic recombination
 - D. Chromosomal aberrations
48. Cystic fibrosis is a Mendelian disorder because:
- A. It was discovered by Mendel
 - B. It occurs more in males than females
 - C. It occurs more in females than males
 - D. It occurs due to mutation at a single genetic locus

SECTION - C

Section-C consists of one case followed by 5 questions (Q. No.49-53) linked to this case. Besides this, few questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- A. Both A and R are true and R is the correct explanation of A**
- B. Both A and R are true and R is not the correct explanation of A**
- C. A is true but R is false**
- D. A is False but R is true**
- E. Both A & R are false**

Attempt any 10 questions in this section. The first attempted 10 questions would be evaluated.

Family planning policies in India have historically been aimed at controlling population growth rather than advancing women's reproductive rights and choices. This led to an explicit promotion of sterilization, targeted nearly exclusively towards women. Down the road the government also started including reversible modern contraception methods. At this time, three new contraceptive methods were introduced in the National Family Planning program—injectable contraceptive, a non-hormonal weekly pill and progesterone-only pills for lactating mothers—all provided free-of cost. Intrauterine device (IUD) remains low despite being covered under public health services for decades and condom use only increased subsequent to HIV prevention efforts in the country. However, the use of reversible contraceptive methods, as well as male sterilization, is still low in India, and female sterilization continues to be the dominant method, accounting for two-thirds of the total contraceptive use.

49. When the family planning programme was initiated:

- A. the focus was on decreasing population growth
 - B. it targeted women's reproductive rights and choices
 - C. the focus was on developing different methods of contraception
 - D. all of these
50. Three new contraceptive methods were introduced in the National Family Planning program
- A. to protect women's reproductive rights and choices.
 - B. Sterilization method was targeted nearly exclusively towards women
 - C. Sterilization method was almost irreversible
 - D. None of these
51. Injectable contraceptive, a non-hormonal weekly pill and progesterone-only pills for lactating mothers gained popularity compared to IUD because:
- A. they were provided free of cost
 - B. they were easy to use compared to IUD
 - C. it was not included in the public health services
 - D. people were not aware of it.
52. Condom use increased despite the other methods being provided free of cost because,
- A. AIDS cases were increasing
 - B. Efforts were made to spread awareness about AIDS
 - C. Efforts were made to spread awareness about AIDS prevention
 - D. All of these
53. **Assertion:** Female sterilization is the predominantly used method, despite all modern methods being made available.
- Reason:** It accounts for two-thirds of the total contraceptive use.
- A.
 - B.
 - C.
 - D.
 - E.
54. Hershey & Chase used radioactive sulphur and radioactive phosphorous in their experiments because
- A. radioactive sulphur and radioactive phosphorous are found in DNA and RNA respectively
 - B. radioactive sulphur and radioactive phosphorous are found in RNA and DNA respectively
 - C. to identify whether DNA or proteins are introduced into the E.coli
 - D. to identify whether DNA or RNA is introduced into the E.coli
55. In Honey bees,
- A. Males and females have equal number of chromosomes
 - B. Males have one chromosome more than females
 - C. Females have one set of chromosomes more than males
 - D. Females have one chromosome more than males
56. Phenylketonuria is caused due to:
- A. Reduced pigmentation in skin and hair
 - B. Lack of phenylalanine
 - C. Lack of phenylalanine hydroxylase
 - D. Mutation in the gene coding for phenylalanine

57. Turner's Syndrome may be caused due to:

- A. Non-disjunction of XX chromosomes in females
- B. Non-disjunction of XY chromosomes in males
- C. Non-disjunction of X X chromosomes in females and XY in males
- D. Fertilization of ovum with one X chromosome and sperm with no sex chromosome

58. **Assertion:** Aminoacylation is an essential step for the synthesis of protein.

Reason: Formation of peptide bond requires energy

- A.
- B.
- C.
- D.
- E.

59. **Assertion:** Deciphering of genetic codes was accomplished using known sequence of nucleotides

Reason: Genetic codes are unpunctuated

- A.
- B.
- C.
- D.
- E.

60. **Assertion:** In Griffith's experiment, the dead R strain caused the transformation of live S strain

Reason: The S strain had smooth polysaccharide coat which made it less virulent

- A.
- B.
- C.
- D.
- E.
