

SAHODAYA PRE BOARD EXAMINATION (TERM I) 2021-22

CLASS XII

BIOLOGY (SET 2)

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.

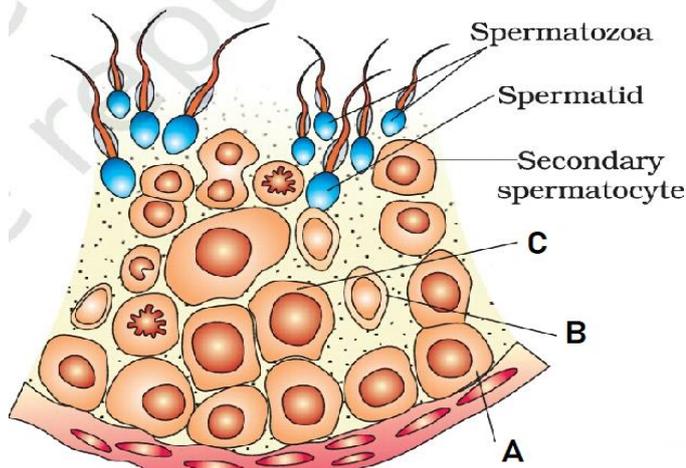
SECTION A

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

1. The functionality of the gametes in angiosperms:
 - (i) Changes with time
 - (ii) Doesn't change with time
 - (iii) Depends on the stigma it has landed on
 - (iv) Depends on the environmental conditions.The correct options are:
 - A. (i) & (iii)
 - B. (iii) & (iv)
 - C. (i), (iii) & (iv)
 - D. (ii), (iii) & (iv)
2. The embryonal axis of a seed comprises of:
 - A. The future root and the future shoot
 - B. The future root, future shoot and cotyledons
 - C. Radicle, plumule and endosperm
 - D. Radicle, plumule, cotyledons and endosperm
3. Parthenocarpic fruits are formed by:
 - A. Development of ovary in the absence of pollination
 - B. Asexual reproduction
 - C. Ovary with an unfertilized ovule
 - D. All of these
4. The vegetative cell and generative cell in a pollen are formed after
 - A. One mitotic and two complete meiotic divisions
 - B. One mitotic and half meiotic division
 - C. One complete meiotic and two mitotic divisions

- D. Only two meiotic divisions
5. There are 2 locules in an ovary each containing 10 ovules. After the development is completed, there will be:
- Ten fruits with 2 seeds each
 - Two fruits with 10 seeds each
 - One fruit with 20 seeds
 - One fruit with 10 seeds
6. Which of the following statements are not correct?
- Cleistogamous flowers are always autogamous
 - Xenogamy occurs by wind/insect pollinators
 - Geitonogamy involves pollen and stigma of staminate & pistillate flowers
 - Chasmogamous flowers can unisexual/bisexual
- (i) & (iii)
 - (ii) & (iii)
 - (ii) & (iv)
 - (iii) & (iv)

Observe the diagram carefully and answer the questions that follow. (Q.No. 7 to Q.No.11)



7. The sequence in which the process occurs is:
- A, B, secondary spermatocyte, spermatid, spermatozoa
 - A, B, C, secondary spermatocyte, spermatozoa, spermatid
 - A, C, secondary spermatocyte, spermatid, spermatozoa
 - A, B, C, secondary spermatocyte, spermatid, spermatozoa
8. The difference between secondary spermatocytes and spermatids is
- secondary spermatocytes are diploid and spermatids are haploid
 - secondary spermatocytes are formed after meiosis I and spermatids are formed after meiosis II
 - secondary spermatocytes are differentiated and spermatids undifferentiated
 - all of these
9. The process that will get affected if the Leydig cells fail in their secretion is
- A to B
 - B to C
 - secondary spermatocytes to spermatids

- D. spermatids to spermatozoa
10. In the human reproductive system, gametes begin their formation from:
- A. Testicular lobules & ovarian locules
 - B. Spermatogonial cells & follicle cells
 - C. Spermatocytes & oocytes
 - D. Spermatogonia & oogonia
11. A child has blood group O. If the father has blood group A and mother's blood group is B, the probable blood groups of other children(siblings) are:
- A. A & B
 - B. A, B & AB
 - C. B & AB
 - D. cannot be determined
12. Dihybrid cross proves that
- A. Gametes retain their purity
 - B. Gametes can assort independent of each other
 - C. Genes segregate and assort independently
 - D. Law of Dominance holds good only in a monohybrid cross.
13. The 9:3:3:1 ratio obtained by Mendel in the dihybrid cross in Garden peas was due to the reason:
- A. The genes coding for two traits were located in different chromosomes
 - B. The alleles coding for each trait were located in different chromosomes
 - C. The traits chosen were such that one was dominant and the other recessive
 - D. The chromosomes were in pairs
14. 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
15. A trait is controlled by three alleles. To understand the inheritance pattern,
- A. A trihybrid cross has to be done
 - B. A pedigree analysis can be done
 - C. A punnet square can be worked out
 - D. A population study must be done
16. When an organism expresses combined effect of two or more alleles,
- A. The alleles are recessive in nature
 - B. The alleles couldn't segregate
 - C. Their genotype can be seen on their phenotype
 - D. It produces more variation
17. The discontinuous strand is made complete by:
- A. DNA ligase
 - B. DNA polymerase

- C. RNA polymerase
 - D. Primase
18. During transcription only one of the strands gets copied because
- A. RNA polymerase can synthesize from 5' to 3' direction only
 - B. Only one strand is the coding strand
 - C. Both strands if copied will form ds RNA
 - D. All of these
19. What determines the time of functioning of a transcription unit?
- A. The initiator codon
 - B. The need of the cell/organism
 - C. The promoter
 - D. The regulator
20. Genes are different from cistron in the sense that,
- A. Genes code for different types of RNAs and Cistron codes for rRNA only
 - B. Genes code for different types of RNAs and Cistron codes for tRNA only
 - C. Genes code for different types of RNAs and Cistron codes for mRNA only
 - D. None of these
21. Translation machinery involves
- A. mRNA, tRNA, ribosomes
 - B. RNA, amino acylated tRNA, ribosomes
 - C. hnRNA, amino acylated tRNA, ribosomes and enzymes
 - D. hnRNA, amino acylated tRNA, ribosomes and ribozymes
22. Triplet codon was verified by:
- A. Synthesizing RNA molecules with defined combinations
 - B. synthesizing the protein in cell free system using microbes
 - C. synthesizing proteins in mutated organisms
 - D. all of these
23. It is important to cut the DNA into fragments during DNA fingerprinting because,
- A. restriction enzymes are added to it
 - B. the fragments have to be purified
 - C. the fragments produce a pattern
 - D. fragments contain the genes
24. Southern blotting is done during DNA fingerprinting because,
- A. from the membrane to the probe
 - B. from agarose gel to the probe
 - C. to add the radioactive probe
 - D. to remove the radioactive probe

SECTION - B

Section - B consists of 31 questions (Sl. 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

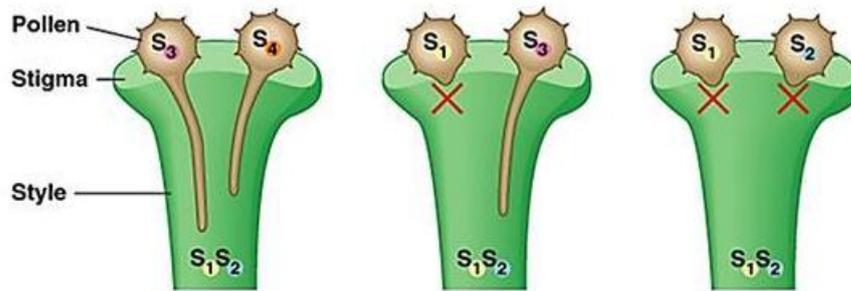
- A.
- B.
- C.
- D.
- E.

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

Reason: Amniotic fluid has the embryonic cells.

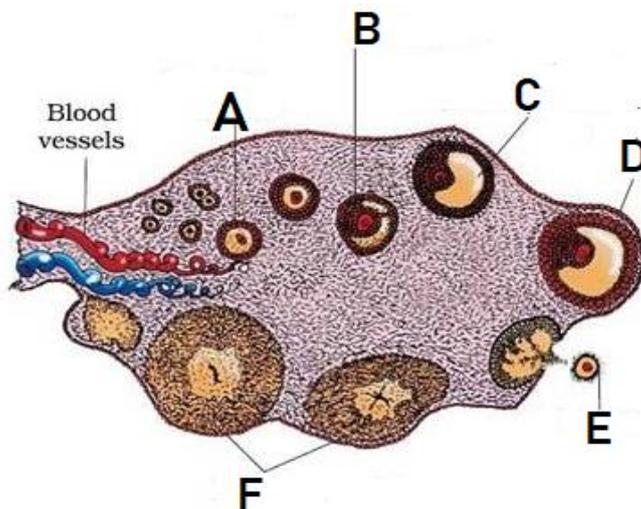
- A.
- B.
- C.
- D.
- E.

29. The following illustration is about:



- A. Self-compatibility
 - B. Self-incompatibility
 - C. Genetic compatibility
 - D. Germination of pollen tube
30. For apomixis to take place,
- A. Fertilization occurs in the nucellus and the embryo protrudes into the embryo sac
 - B. Fertilization occurs in the tapetum and the embryo protrudes into the embryo sac
 - C. Fertilization does not occur
 - D. Flowers must be unisexual
31. Choose the odd one out:
antipodals, micropyle, tapetum, synergids
- A. Antipodals
 - B. Tapetum
 - C. Micropyle
 - D. Synergids

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

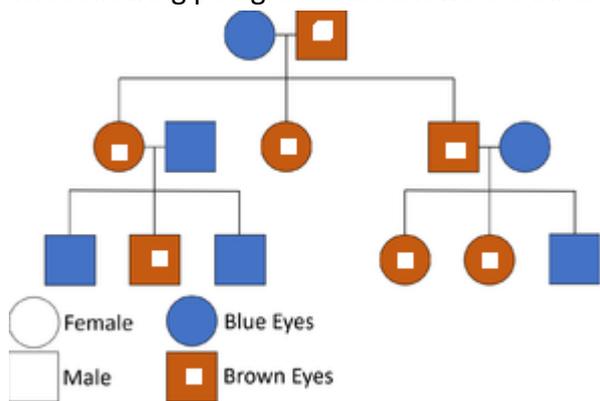


32. The structure labelled as A is formed:
- A. At puberty
 - B. During embryonic development
 - C. During foetal development
 - D. After birth

33. The main difference between A and B is
- A. Number of follicular layers
 - B. Number of chromosomes
 - C. Both of these
 - D. None of these
34. 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
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. 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
37. 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
38. 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
39. 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
40. 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
41. Each gamete carries,
- A. recessive allele & dominant allele
 - B. a set of sex chromosomes
 - C. Only one of the alleles
 - D. None of these
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. Down's Syndrome is caused due to fusion of two gametes each carrying:
- A. A copy of 23rd chromosome and a pair of 23rd chromosome
 - B. A copy of 21st chromosome and a pair of 23rd chromosome
 - C. A copy of 21st chromosome and a pair of 21st chromosome
 - D. A copy of 23rd chromosome and a pair of 21st chromosome

47. 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
48. 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

SECTION - C

Section-C consists of one case followed by 5 (Q.No.49-53) questions 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. In grasshoppers,
- 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
55. 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. all of these
56. Variations in the genetic makeup of an organism undergoing asexual reproduction is mainly due to:
- A. Mutation
 - B. Genetic recombination
 - C. Mutation and Genetic recombination
 - D. Chromosomal aberrations

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 XX 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.
