Bhavan's Tripura Vidyamandir

1ST Periodic Assessment - (2024-2025)

Class:- 12 **Subject:- Biology**

Time:- 2 Hours Total :- 50 Marks

Name of the student: Roll: Section:

General Instructions:

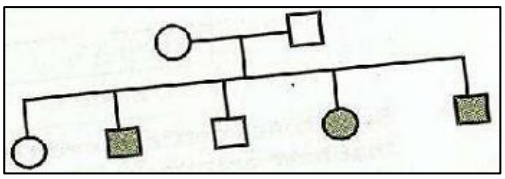
1. The question paper comprises four sections- A, B, C and D. Attempt all the sections.
2. All questions are compulsory. Internal choices are there in some questions.
3. Section-A comprises of 20 questions (Q. No 1 to 20) carrying 1 mark each.
4. Section-B comprises (Q. No 21 to 25) carrying 2 marks each.
5. Section-C comprises (Q. No 26 to 30) carrying 3 marks each.
6. Section-D comprises Q. No 31 carrying 5 marks each.
7. Whenever necessary, neat and properly labelled diagrams should be drawn.

SECTION-A (1X20 = 20)

1. Which of the following structures is well-developed in a mature seed of black pepper?
   (a) Perisperm (b) Thalamus (c) Sepals (d) Peduncle
2. Extrusion of second polar body from egg nucleus occurs
   (a) after entry of sperm but before fertilization (b) after fertilization
   (c) before entry of sperm into ovum (d) simultaneously with first cleavage
3. The mode of action of the copper ions in an IUD is to
   (a) increase the movement of sperms. (b) decrease the movement of the sperms.
   (c) make the uterus unsuitable for implantation. (d) make the cervix hostile to the sperms.
4. Testicular lobules contain
   (a) 3-5 seminiferous tubules (b) 2-6 seminiferous tubules
   (c) 5-7 seminiferous tubules (d) 1-3 seminiferous tubules
5. During which phase of the pregnancy, MTP is safe?
   (a) 1st trimester (b) 2nd trimester
   (c) 3rd semester (d) Fourth semester
6. Which of the following combination of chromosome numbers represents the correct sex determination pattern in honey bees?
   (a) Male 32, Female 16 (b) Male 16, Female 32
   (c) Male 31, Female 32 (d) Female 32, Male 31
7. Intense lactation in mothers acts as a natural contraceptive due to
   (a) suppression of gonadotropins (b) hypersecretion of gonadotropins
   (c) suppression of gamete transport (d) suppression of fertilization
8. A multicarpellary syncarpous pistil with five free stigmas is found in
   (a) Hibiscus (b) Gossypium (c) Papaver (d) Citrus
9. Milk secreted from the cells of alveoli of mammary lobes reaches nipple through lactiferous duct (L), mammary duct (M), mammary tubule (T) and mammary ampulla (A) in the following order
   (a) TMAL (b) MTLA (c) MTAL (d) ATML
10. The ploidy of apomictic embryos developing from the nucellus and antipodal cells respectively would be
    (a) 2n, 3n (b) 2n, n (c) 3n, 2n (d) n, 2n
11. For normal fertility what percent of the sperm in ejaculation must exhibit vigorous motility?
    (a) 20 (b) 30 (c) 40 (d) 60

12. Identify the category of genetic disorder depicted in the pedigree chart given below:

(a) X linked recessive
(b) X-linked dominant
(c) Autosomal dominant
(d) Autosomal recessive



13. Select the plant species, where emasculation is not required for artificial hybridisation experiment?
(a) Castor (b) Maize (c) Papaya (d) Wheat
14. Which one of the following is an incorrect statement with regard to pedigree analysis?
(a) It verifies that DNA is the carrier of genetic information.
(b) It helps to understand whether the trait depicted in the chart is dominant or recessive.
(c) It confirms that the trait is linked to one of the autosome.
(d) It helps to trace the inheritance of a specific trait.
15. A couple has two daughters. What is the probability that the third child will also be a female?
(a) 25% (b) 50% (c) 75% (d) 100%
16. Expand CDRI
(a) Centralised drug development and Research institution
(b) Child development research institute
(c) Central Drug Research Institute
(d) Common development research institute

Question No. 17 to 20 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.

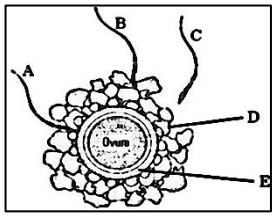
17. **Assertion:-** Geitonogamy helps in maintaining homozygosity and superiority of the race indefinitely.
Reason:- It is functionally, ecologically and genetically cross pollination.
18. **Assertion:-** Saheli, an oral contraceptive for females, contains a steroidal preparation.
Reason:- It is "once a week" pill with very few side effects.
19. **Assertion:-** Endometrium is necessary for implantation of blastocyst.
Reason :- In the absence of fertilization, the corpus luteum degenerates that causes disintegration of endometrium.
20. **Assertion:-** In Thalassemia an abnormal myoglobin chain is synthesized due to gene defect.
Reason:- α-thalassemia is controlled by genes HBA1 and HBA2 on chromosome 16.

SECTION-B

(2 x 5 =10)

21. (a) Mention the scientific name of the organism on which T.H. Morgan performed his experiment. **(1)**
(b) Why did he prefer to work with that organism? Give any two reasons. **(1)**
22. A guava fruit has 200 viable seeds. (a) What are viable seeds? (b) Write total no. of (i) pollen grains and (ii) gametes in producing 200 viable guava seeds. **(1+1)**
23. (a) Why is Sickle cell anemia, a human blood disorder so named? **(1)**
(b) Explain the genetic basis that results in the expression of this disorder? **(1)**
24. Study the illustration given below and answer the questions that follow:

(a) Identify 'D' and 'E'. **(0.5 + 0.5)**
(b) Mention the role of 'E'. **(1)**



25. Write a short note on Amniocentesis. **(2)**

Or,

(a) State the role of oxytocin in parturition. **(1)**

(b) What triggers it releases from the pituitary? **(1)**

SECTION-C **(3X5=15)**

26. Draw a well labelled diagram of sectional view of male gametophyte/microspore of an angiosperm and write the functions of any two parts labelled. (Any four labels) **(2+1)**

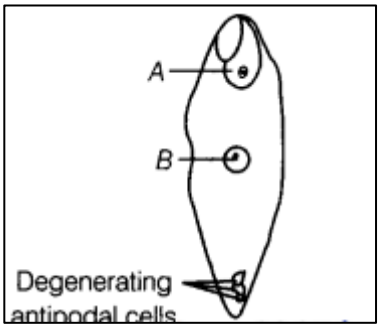
27. Expand and explain the following techniques used in the "Test Tube Baby's programme:

(i) GIFT **(1)**

(ii) ZIFT **(1)**

(iii) IUI **(1)**

28. The diagram below shows the embryo sac after fertilisation. Observe it and answer the following questions.



(a) Give the names of the structures which develop from parts labelled as A and B in the above diagram. **(2)**

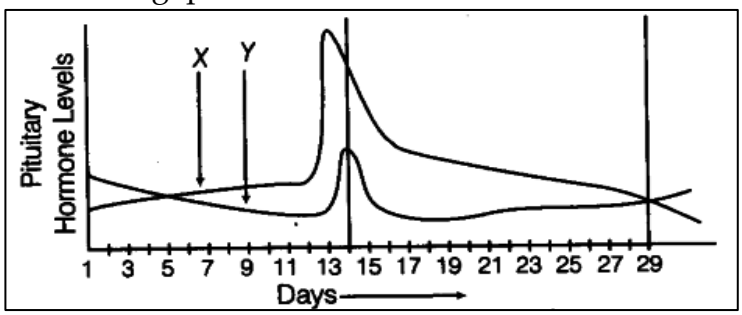
(b) Meiocyte of onion has 16 chromosomes. What will be the number of chromosomes in the structures developing from parts 'A' and 'B'? **(1)**

Or,

Spermatogenesis in human males is a hormone regulated process. Justify.

29. A pea plant with purple flowers, when crossed with a plant with white, produced 50 plants with only purple flowers. On selfing these plants produced 482 plants with purple flower and 162 with white flowers. Explain the pattern of inheritance with the help of Punnet square.

30. Study the graph given below and answer the following questions: -



(a) Name the hormones 'X' and 'Y' **(1)**

(b) Identify the ovarian phase during a menstrual cycle. **(1)**

(i) 5th day to 12th day of the cycle.

(ii) 14th day of the cycle

(c) Explain the ovarian events (i) and (ii) under the influence of 'X' and 'Y'. **(1)**

Or,

(a) A normal human sperm (22+Y) fertilises an ovum with karyotype '22+XX'. Name the disorder the offspring thus produced would suffer from and write any two symptoms of this disorder. **(2)**

(b) Name a best known and most common autosomal aneuploid abnormality in human and write any two symptoms. **(1)**

SECTION-D **(1X5=5)**

31. (i) Name the embryonic stage that gets implanted in the uterus. Explain the process of implantation in a human female. **(2)**

(ii) Draw the schematic representation of oogenesis. **(3)**

Or,

(i) Double fertilization is an event unique to all flowering plants. Explain the process. **(3)**

(ii) Give a reason for the following:

(a) Apple is a false fruit but Guava is a true fruit. **(1)**

(b) A seed of an orange has many embryos. **(1)**