

PT-2/HALF YEARLY EXAMINATION, 2022-23

BIOLOGY

Time - 07:15 AM to 10:20 AM

Class – XII

M.M. : 70

Date – 10.09.2022 (Saturday)

Name of the student _____ Section _____

General Instructions –

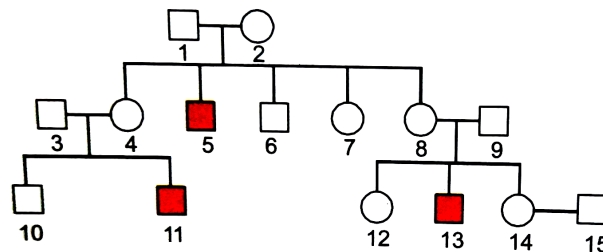
- All questions are compulsory.
- Section A consists of 14 questions of 1 mark each and 2 questions which are case based of 4 marks each.
- Section B consists of 9 questions of 2 marks each.
- Section C consists of 5 questions of 3 marks each.
- Section D consists of 3 questions of 5 marks each.
- Draw diagrams wherever necessary.

SECTION A

- Q1. Name any two non albuminous seeds.
- Q2. Angiosperm bearing unisexual flowers are set to be either monoecious or dioecious. Explain with the help of one example of each.
- Q3. One oogonium forms
- 1 ovum + 3 polar bodies
 - 1 ovum+1 polar body
 - 1 ovum without centriole + 1 polar bodies
 - 1 ovum and no polar body
- Q4. Assertion (A) - Both ZIFT and IUT are embryo transfer techniques.
Reason (R) - In both ZIFT and IUT number of cells in zygote is same.
- If both A and R are true and R is the correct explanation of A.
 - If both A and R are true and R is not the correct explanation of A.
 - If A is true , but R is false.
 - If both A and R are false

OR

The given Pedigree chart for haemophilia shows -



- Autosomal dominant
- Autosomal recessive
- X linked dominant
- X linked recessive

- Q5. In a dihybrid cross when white eyed yellow bodied female drosophila was crossed with red eyed brown bodied male Drosophila, produced in F2 generation 1.3%recombinants and 98.7% progeny with parental combinations. This observation of Morgan deviated from Mendelian F2 phenotypic dihybrid ratio. Explain giving reasons, for Morgan's observations.
- Q6. The sequence of one stand of DNA is written as follows
5' ATGCATGCATGCATGCATGC 3', write down the sequence of complementary stand in 5'- 3' direction.
- Q7. Where does transcription and translation occur in bacteria and eukaryote respectively?

OR

Answer the following :

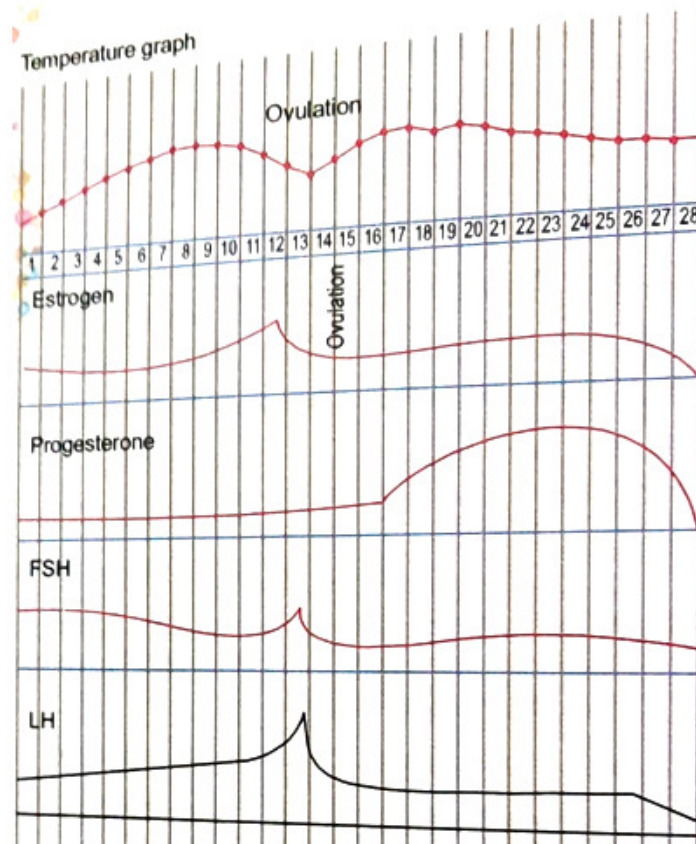
- A) What are IUDs?
B) How do they prevent conception?
- Q8. State two postulates of Oparin and Haldane's theory with reference to the origin of life.
- Q9. If E.coli allowed to grow in a culture medium for 80 minutes by Mathew Messelson and Franklin Stahl in their experiments, the proportion of light and hybrid density DNA molecule would have been
A) 87.5% of light density DNA and 12.5% of hybrid density DNA.
B) 75% of light density DNA and 25% of hybrid density.
C) 50% of light density DNA and 50% of hybrid density DNA.
D) 12.5% of light density DNA and 87.5% of hybrid density DNA.
- Q10. Name the vegetative propagule of ginger and agave.

OR

Give the difference between menstrual cycle and oestrous cycle.

- Q11. What is founder effect?
- Q12. Explain the following algebraic equation on the basis of Hardy-Weinberg principle.
$$p^2 + 2pq + q^2 = 1$$
- Q13. Name the placental mammals corresponding to Australian spotted cuscus and Tasmanian Tiger cat, which have evolved as a result of convergent evolution.
- Q14. What is polygenic inheritance?
- Q15. Case below is followed by 5 questions attempt any 4.

A group of medical students carried out a detailed study on the impact of various factors on the different hormones during menstrual cycle in a human female. They collected the data with different factors. Given below is the graph plotted from the data collected showing the morning temperature and the concentration of hormones FSH, LH, oestrogen and progesterone during normal menstrual cycle in a woman.



1. The early morning recording of temperature in the graph during actual menstruation and during ovulation respectively are
 A. low , high B. high, low C. low, low D. high, high
 2. The time of ovulation is important in cases of
 i. couples having difficulty in conception
 ii. to know the safe period for prevention of pregnancy
 iii. to inhibit the process of ovulation
 iv. to stimulate ovarian follicular development
 A) i & iv B) ii & iv C) i & ii D) iii & iv
 3. The increase in the level of progesterone is maximum under the influence of LH during
 A) secretory phase B) follicular phase C) menstruation D) proliferation phase
 4. Which of the following hormone/ hormones is / are showing Rapid surge leading to changes in graafian follicle before ovulation ?
 A) LH B) FSH C) FSH & oestrogen D) FSH & LH
 5. The human Corpus luteum starts regressing ____ days after ovulation (identify the correct choice for the blank)
 A) 10- 11 B) 14 -15 C) 16- 17 D) 18 -20
- Q16. tRNA has names like soluble RNA, transfer RNA and adaptor RNA. If two ends has 3' and 5' like any other poly nucleotide. The body is folded variously to form loop giving a clover leaf or inverted L shape. 5' has phosphate while 3' end is specialised. Similarly

loops are specialised to make contact with different structures. Base of one of its loop has special arrangement of nucleotides for forming contact with the codon of mRNA.

After going through the paragraph answer the following questions

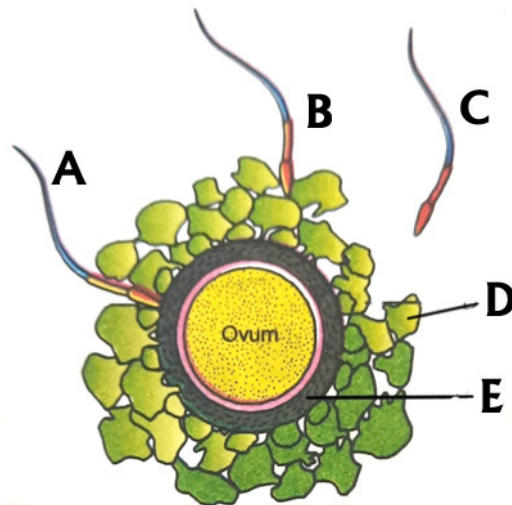
1. What is the name of 3' end of tRNA
A) Terminator end B) Promoter end C) CCA-OH D) anticodon region
2. What is the alternate name of anticodon
A) magnet B) NODOC C) AA Sythetase D) TYC
3. What is the wobble position of anticodon
A) 3' end B) Middle C) 5' end D) none of these
4. As compared to amino acids the number of tRNA is
A) same B) less C) more D) variable

SECTION B

- Q17. What is self incompatibility ? Why does self pollination not lead to seed formation in self incompatible species ?
- Q18. What is the significance of progesterone and estrogen combination as a contraceptive measure?

OR

Study the diagram and answer the following questions.

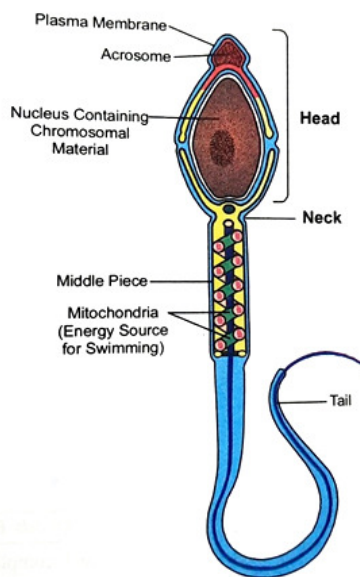


- (i) Which one of the sperm will reach the ovum earlier?
 - (ii) Identify D and E. Mention the role of E.
- Q19. How would you find the genotype of tall pea plant bearing white flowers ? Explain with the help of a cross. Name the type of cross you would use.
- Q20. Both haemophilia and Thalassemia blood related disorders in human. Write the causes and the difference between the two. Name the category of genetic disorder they both come under.

- Q21. a) How does chromosomal disorder differ from Mendelian disorder ?
 b) Name two chromosomal aberration associated disorders.
- Q22. During DNA replication why is it that the entire molecule does not open in one go, explain replication fork. What are the two functions that the monomers dNTPs play?
- Q23. What is aminoacylation ? State its significance.
- Q24. Write any three goals of Human Genome Project.
- Q25. Write the characteristics of Ramapithecus, Dryopithecus and Neanderthal man.

SECTION - C

- Q26. A student watering his plants , he observed bright colour of Hibiscus flower. He tried to pluck it, he mistakenly touch the anthers. He found deposition of yellowish powder on his fingers.
- What is the yellow powder on his finger?
 - What is the diameter of pollen grains ?
 - What is exine?
 - What is Germ pore?
 - Name the material which provides hard texture to the exine.
- Q27. Draw a neat diagram of the female reproductive system and label the parts associated with the following
- production of gametes
 - site of fertilization
 - site of implantation
 - birth canal
- Q28. Refer to the diagram given of a human sperm and answer the question that follows –



- State the significance of cap like structure called acrosome on the human sperm.
- What are the roles of proximal Centriole and distal centriole in the neck region of the sperm ?
- What will happen if a sperm fails to contact an ovum within a specific period?

Q29. A) What is polyembryony?

B) How Dicot embryo differ from monocot embryo, explain with the help of labelled diagrams.

Q30. The gene I that controls the ABO blood grouping in human beings has three alleles IA IB and i.

Explain how many different types of genotypes and phenotypes are likely to be present in the human population.

OR

i) Expand VNTR and describe its role in DNA fingerprinting.

ii) List any two application of DNA fingerprinting techniques.

SECTION - D

Q31. A flower of tomato plant following the process of sexual reproduction produces 240 viable seeds. Answer the following questions giving reasons.

i) What is the minimum number of pollen grains that must have been involved in the pollination of Pistil?

ii) What would have been the minimum number of ovules present in the ovary?

iii) How many Megaspore mother cells were involved?

iv) What is the minimum number of microspore mother cell involved in the above case?

v) How many gametes were involved in this case?

OR

Describe monosporic development of female gametophyte with labelled diagrams.

Q32. Explain oogenesis with labelled diagrams.

OR

Trace the events taking place in a flower from the time of pollen grain entry up to the completion of fertilization with labelled diagrams.

Q33. Describe with labelled diagrams Messelson and Stahl experiment.

OR

Describe with labelled diagrams Harshey and Chase experiment.

