दिव्यते ज्ञान ज्योतिसा जगत

S.S.COLLEGE, JEHANABAD

Department of Zoology

Name:	Class:
Class Roll No.:	Total Marks: 40
Assignment: July 03, 2021	Submission: July 05, 2021

M.Sc. Zoo. Sem I - CC-3 Test (Genetics)

This MCQs is for evaluation of students peresnt on the Zoom class held between Jume 28, 2021 to July 03, 2021. It has a total of 40 questions and a total of 40 marks. Each question carries 1 mark. There is no minus marking.

1. What is lampbrush chromosome?

   (A) It is bivalent giant chromsome found in the oocytes of birds and amphibians.
   (B) It is giant chromsome found in the salivary glands of some dipteran larvae.
   (C) It is a giant chromsome found in the oocytes of human.
   (D) It is a giant chromsome found in the liver of human.

2. Lampbrush chromosome is seen in which stage of cell cycle?

   (A) Zygotene of prophase I of meiotic cell division.
   (B) Diplotene of prophase I of meiotic cell division.
   (C) Pachytene of prophase I of meiotic cell division.
   (D) Leptotene of prophase I of meiotic cell division.

3. Lampbrush chromosome consists of _____

   (A) one pairs of sister chromatids.
   (B) two pairs of sister chromatids.
   (C) three pairs of sister chromatids.
   (D) four pairs of sister chromatids.

4. Why it is called as lampbrush chromosome?

   (A) Bacause a large number of side loops perpendicular to the chromsome axis makes the structure comparable to the lampbrush.
   (B) Because whole chromosome uncoiled and radiates to form a brush like structure that looks like lampbrush.
   (C) Because all chromatene fibres interwoven onto a protein scaffold to form a lampbrush like structure.
   (D) None of the above

5. Side loops of lampbrush chromosome is the site of _____

   (A) replication
   (B) recombination
   (C) transcription
   (D) translation

6. Side loops of Lampbrush Chromosome (LBC) is _____

   (A) symmetrical in appearance
   (B) asymmetrical in appearance
   (C) bilaterally symmetrical in appearance
   (D) flickering in nature

7. Side loops, which are the sites of gene transciption, emanates from where in the chromosome?

   (A) Chromocenter
   (B) Chromomere
   (C) Centromere
   (D) Nuclear membrane

8. From which region of the side loops in the lampbrush chromosome does transcription begin?

   (A) Thin region of the loops
   (B) Thick region of the loops
   (C) Anywhere in the loops
   (D) None of the above

9. How many loops are found in the diploid set of lampbrush chromsome?

   (A) 10000
   (B) 20000
   (C) 30000
   (D) 10

10. What is the biological significance of lampbrush chromosome?

    (A) It meets the demand of biomolecules of oocytes.
    (B) It is required to form such large mass of egg yolk.
    (C) It is required to meet the demand of biomolecules needed at the time of embryonic development.
    (D) It is required for the fertilization.

11. Total length of entire lampbrush chromosome (LBC) is _____.

    (A) 5 to 6 nm
    (B) 5 to 6 mm
    (C) 5 to 6 cm
    (D) 10 nm

12. How many chromomeres may be found in a single lampbrush chromosome (LBC)?

    (A) ~1000
    (B) ~2000
    (C) ~3500
    (D) ~5000

13. Thickening of lateral loop of lampbrush chromosome (LBC) is due to _____.

(A) the presence of polysaccharides around the loop.
(B) the presence of lipids and proteins around the loop.
(C) the presence of RNA and proteins around the loop.
(D) due to condensation of loops.

14. How many loops can be emanated from a single chromomere?

(A) Only one pair of lateral loops.
(B) 1 to 5 pairs of lateral loops.
(C) 1 to 9 pairs of lateral loops.
(D) 1 to 17 pairs of lateral loops.

15. What is direction of loop movement during transcrition?

(A) Thin end to thick end
(B) Thick end to thin end
(C) Thin end to thick end and vice versa
(D) No movement, loop is permanent

16. Chromomere of lampbrush chromosome (LBC) is _____.

(A) transcritionally active region
(B) transcritionally inactive region
(C) region that supports lateral loops
(D) None of the above

17. How many percent of DNA is present in lateral loops of lampbrush chromosome (LBC)?

(A) 5 - 10%
(B) ~ 15%
(C) ~20%
(D) 15 - 25%

18. After the transcription ceases, lateral loops are found to be disappeared. What happened to the lateral loops?

(A) Lateral loops are spliced off by the gyrases.
(B) Lateral loops are reabsorbed back into the chromomeres.
(C) Lateral loops dissolved by the hydrolytic enzymes due to uncloiled structure.
(D) None of the above

19. What is purpose of lampbrush chromosome in oocytes of birds and amphibians?

(A) It is formed to meet the demand during cleavage.
(B) It is formed to meet the high metabolic rate of oocytes.
(C) It is formed to sustain large size of oocytes.
(D) All of the above

20. Formation of lateral loops confers the lampbrush chromosome (LBC) to less condensed than other chromsomes. Is it true? If true, what degree of lightly packing occurs in lampbrush chromosome?

(A) Yes, about 10%
(B) Yes, about 20%
(C) Yes, about 30%
(D) No, it is almost similar level compactness.

21. In biological research, lampbrush chromosome (LBC) is said to be a fit model system for which type of studies?

(A) gene expression & hybridization analysis
(B) gene expression and gene cloning experiments.
(C) gene cloning and vector experiments
(D) All of the above

22. Polytene chromosomes represent which stage of cell cycle?

(A) Prophase of meiotic I cell division
(B) Prophase of mitotic cell division
(C) Interphase of mitotic cell division
(D) late Diplotene stage of peitic I division

23. Polytene chromosome is found in which of the following?

(A) Salivary gland of dipteran larvae
(B) Malpighian tubules of dipteran larvae
(C) Rectal tissue of dipteran larvae
(D) All of the above

24. Polytene chromosome can have a length of up to _____.

(A) 10µm
(B) 50µm
(C) 100µm
(D) 200µm

25. Why do polytene chromosomes become so enormous in size?

(A) There is uncontrolled replication of DNA in the salivary gland cells of dipteran insects.
(B) There is duplication of DNA without segregation in the salivary gland cells of dipteran insects.
(C) There is a duplication and segregation of chromosme, but segregated chromosomes again unite to form Giant chromosome.
(D) All of the above

26. Which of the following is the largest chromosome?

(A) Polytene chromosomes
(B) Lampbrush chromsomes
(C) Sex chromosomes
(D) Both a. & b.

27. The longest arm of which chromosome is exhibited in polytene chromosome?

(A) Right arm of II chromsome
(B) Left arm of II chromsome
(C) Right arm of IV chromosome
(D) Sex chromosome of polytene chromosome

28. Polytene chromsomes show band-pattern after DNA staining? What do you mean by these bands of polytene chromosome?

(A) Dark band is transcriptionally inactive region and interband or light band is transcriptionally active.
(B) Dark band is transcriptionally active region and interband or light band is transcriptionally inactive.
(C) Light band is more transcriptionally active than light interbands.
(D) None

29. Dark bands refers the _____.

(A) Euchromatic region of polytene chromosome
(B) Slightly heterochromatic region of polytene chromosome
(C) Heterochromatic region of the polytene chromsome
(D) None of the above

30. Interbands or light bands constitute how much of the total polytene chromosome?

(A) ~5%
(B) ~15%
(C) ~25%
(D) ~35%

31. How many bands are found in the 4 chromosomes of *Drosophila melanogaster*?

(A) ~2500
(B) ~3500
(C) ~4000
(D) ~5000

32. The larger size of the polytene chromosome is due the presence of many longitudinal strnads. What is called those strands?

(A) Chromonemata
(B) Chromomere
(C) Chromocentre
(D) Chrotids

33. Polytene homologues are held together by _____.

(A) crossing over
(B) somatic pairing
(C) tying by longest arm of the chromosomes
(D) All of the above

34. If a cell divides by 10 generation then how many identical strands of chromatin lined up side by side?

(A) 144 chromatin fibres
(B) 256 chromatin fibres
(C) 824 chromatin fibres
(D) 1024 chromatin fibres

35. The process of making multiple copies of chromosomes that are tightly held together is known as _____.

(A) Polymerization
(B) Polyubiquitization
(C) Polytenization
(D) Polyribosylation

36. What is chromosomal puff or Balbiani ring?

(A) Chromosome puffs are decondensed, expanded segments that represent active chromsomal regin.
(B) Chromosome puffs are condensed ball-like unexpendable part of the chromosme segments that represent active chromsomal regin.
(C) Chromosome puffs are condensed ball of DNA which are usually inert.
(D) None of the above

37. Which are the factors that hold sister chromatids together?

(A) Topological entanglement caused by DNA coiling
(B) Underreplication in cell types
(C) Somatic pairing
(D) All of the above

38. What causes Bar phenotyep of kideny-shaped eyes in dipterans?

(A) Tandem duplication of various polytene bands located near the centromeren of autosomes.
(B) Tandem duplication of various polytene bands located near the centromere of X-chromosome.
(C) Tandem duplication of various polytene bands located near the centromere of Y-chromosome.
(D) All of the above

39. What is the metabolic advantage of such unsegrgated multiple copies of genes?

(A) high level of gene expression.
(B) high respiration quotient
(C) high respiration quotient
(D) None of these

40. Which is required to separate polytene chromosomes into individual strands?

(A) Condensins
(B) Cohesins
(C) Condensins plus DNA gyrase
(D) Cohesins plus DNA gyrase