Subject: Zoology

Paper name: Molecular Biology and Genetics

Paper No.: ZL XVII

Semester: 6th Semester

A. Multiple choice questions: (5) from each unit)

1. Nitrogenous base is attached to which carbon in the sugar
(a) Carbon no. 1 ( )
(b) Carbon no. 2 ( )
(c) Carbon no. 3 ( )
(d) carbon no. 5 ( )

2. Histone Octamer is comprised of two of
(a) H1, $H_2A$, $H_2B$, H3 ( )
(b) $H_2A$, $H_2B$, H3, H4 ( )
(c) $H_2A$, $H_2B$, H3, H5 ( )
(d) $H_2A$, $H_2B$, H3, H6 ( )

3. The 3' end of tRNA is known as
(a) Anticodon loop ( )
(b) Variable arm ( )
(c) Aminoacyl site ( )
(d) Acceptor arm ( )

4. Example of facultative heterochromatin is

(a) X chromosome of human female ( )

(b) Y chromosome of Drosophila ( )

(c) 21st chromosome of human ( )

(d) Philadelphia chromosome ( )

5. The 3'-OH of one nucleotide is linked to 5' Phosphate of the next nucleotide by

(a) Phosphodiester bond ( )

(b) Hydrogen bond ( )

(c) Peptide bond ( )

(d) Disulphide bond ( )

6. Semiconservative method of DNA replication was proved by
(a) Meselson & Stahl ( )
(b) Watson and Crick ( )
(c) Jacob and Monod ( )
(d) Hershey and Chase. ( )

7. Replication occurs in which direction
(a) 5' – 3' ( )
(b) 3' – 5' ( )
(c) both directions ( )
(d) Multiple direction. ( )

8. Which of the following binds to separated DNA strand?
(a) Helicase ( )
(b) Topoisomerase ( )
(c) Gyrase ( )
(d) SSBP ( )

9. Thymine dimers are caused by

(a) Single strand breakage ( )

(b) Double strand breakage ( )

(c) Mismatch base pairs ( )

(d) UV rays ( )

10. In DNA replication, the strand which is synthesized continuously is called

(a) lagging strand ( )

(b) Okazaki fragments( )

(c) leading strand ( )

(d) template strand ( )

11. The three structural genes are involved in

(a) transcription ( )

(b) translation ( )

(c) replication ( )

(d) *lac* operon ( )

12. RNA polymerase enzyme is made up of

(a) $\alpha_2\beta\beta'\omega\sigma$ ( )

(b) $\alpha_1\beta\beta'\omega\sigma$ ( )

© $\alpha_2\beta\beta'\omega\sigma_2$ ( )

(d) All of these ( )

13. Genetic code is

(a) Degenerate ( )

(b) Triplet code ( )

(c) Universal ( )

(d) All of the above ( )

14. Translation occurs inside the

(a) Nucleus ( )

(b) Cytoplasm ( )

(c) Cell membranes ( )

(d) Nucleolus ( )

15. Unwinding of DNA helix by breaking hydrogen bonds is done by

(a) DNA ligase ( )

(b) DNA polymerse ( )

(c) Helicase ( )

(d) Topoisomerase ( )

16. Which one of the following is an example of co-dominance?

(a) ABO blood group in man ( )

(b) Eye colour in *Drosophila* ( )

(c) Kernel colour in wheat ( )

(d) Coat colour of shorthorn breed of cattle ( )

17. Which one of the following is an example of multiple allelism

(a) Coat colour of rabbit ( )

(b) Wings of drosophila ( )

(c)Blood groups in man ( )

(d) All of these ( )

18. When a single gene is having multiple effects, it is called

(a) Multiple allelism ( )

(b) Pleiotropism ( )

(c) Dosage compensation ( )

(d) One gene-one enzyme hypothesis ( )

19. Cytoplasmic inheritance is ( )

(a) Maternal inheritance ( )

(b) Extra nuclear inheritance ( )

(c) Inheritance by cell organelles ( )

(d) All of these

20. Mendel's dihybrid ratio is

(a) 1:2:1 ( )

(b) 3:1 ( )

(c) 9:4:3 ( )

(d) 9:3:3:1 ( )

21. Trisomy of chromosome 21 is

(a) Turner's syndrome ( )

(b) Down's syndrome ( )

(c) Patau's syndrome ( )

(d) Klinefelter's syndrome ( )

22. Human with X0 sex chromosome is having

(a) Turner's syndrome ( )

(b) Down's syndrome ( )

(c) Patau's syndrome ( )

(d) Klinefelter's syndrome ( )

23. Testis determining factor (TDF) is present in

(a) Autosome ( )

(b) X chromosome ( )

(c) Y chromosome ( )

(d) Metacentric chromosome ( )

24. When an abnormal egg with XX chromosome is fused with normal sperm carrying Y chromosome, it result in

(a) Turner's syndrome ( )

(b) Down's syndrome ( )

(c) Patau's syndrome ( )

(d) Klinefelter's syndrome ( )

25. Which one of the following genetic disorder is not sex-linked?

(a) Haemophilia ( )

(b) Eye colour in Drosophila ( )

(c) Colour blindness ( )

(d) Down's syndrome ( )

B. Fill up the blanks: (3) from each unit

1. Permanently inactive heterochromatin that remains condensed throughout the cell cycle is called_____

2. The packaging of nucleosome is facilitated by Histone and _____proteins.

3. There are _____ hydrogen bonds between Adenine and Thymine.

4. _____enzyme recognize the damaged base in the DNA.

5. DNA replication is a semi_____ process

6. _____ are a short strands of DNA produced during discontinuous replication of the lagging strand.

7. In transcription, the template strand is called _____ strand.

8. The flow of information from DNA to mRNA to protein is called _____ of molecular biology.

9. _____ is a starting codon.

10. Mendel's Law of segregation is also called Law of _____

11. The expression of both alleles in a heterozygote is called _____

12. A gene which suppresses or masked the action of a gene at another locus is termed as _____ gene.

13. Crossing over occurs at _____ of meiosis.

14. Complete linkage is due to absence of _____ between genes on same chromosome.

15. The chromosomes which are responsible for the determination of sex are known as _____ chromosomes.

Key Answers

A. Multiple Choice

1. (a) Carbon no. 1
2. (b) $H_2A$, $H_2B$, H3,H4
3. (c) Aminoacyl site
4. (a) X chromosome of human female
5. (a) Phosphodiester bond
6. (a) Meselson & Stahl
7. (a) 5' – 3'
8. (d) SSBP
9. (d) UV rays
10. (c) leading strand
11. (d) *lac* operon
12. (a) $\alpha_2\beta\beta'\omega\sigma$
13. (d) All of the above
14. (b) Cytoplasm
15. (c) Helicase
16. (a) ABO blood group in man
17. (d) All of these
18. (b) Pleiotropism
19. (d) All of these

20. (d) 9:3:3:1
21. (b) Down's syndrome
22. (a) Turner's syndrome
23. (c) Y chromosome
24. (d) Klinefelter's syndrome
25. (d) Down's syndrome

B. Fill up the blanks

1. Constitutive heterochromatin

2. Non-histone proteins

3. Two

4. Glucosylase

5. Conservative

6. Okazaki fragments

7. Sense strand

8. Central dogma

9. AUG

10. Purity of gametes

11. Codominance

12. Epistatic gene

13. Pachytene

14. Crossing over

15. Sex

(Dr. Lalzahawmi Chenkual)
Govt. Zirtiri Residential Science College.
29/5/2020.