Reg. No:
Date:07-11-2019

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE-27
B.Sc. ZOOLOGY - V SEMESTER
SEMESTER EXAMINATION: OCTOBER 2019
ZO 5115 - CELL BIOLOGY, MOLECULAR BIOLOGY AND IMMUNOLOGY

Time: $2^{1/2}$ Hours **Max. Marks: 70**

This paper contains three printed pages and three parts
Note: Draw neat labelled diagrams wherever necessary
Indicate the question numbers clearly.

PART A

I. Answer the following **15 X 1= 15**

1. The magnification of a compound microscope that uses an objective lens of 75X and an eye-piece of 15X magnification respectively is
   a. 90X b. 60X c. 750X d. 1125X

2. In mitochondria, cristae act as sites for
   a. Protein synthesis b. Oxidation-reduction reaction
   c. Breakdown of macromolecules d. Phosphorylation of flavoproteins

3. Lysosomes are absent in
   a. Erythrocytes b. Plasma cells c. Nerve cells d. Muscle cells

4. A chromosome in which the centromere is situated near one end is known as
   a. Metacentric b. Sub-metacentric c. Acrocentric d. Telocentric

5. Which stem cells have the most potency
   a. Multipotent b. Pluripotent c. Totipotent d. Unipotent

6. In *Caenorhabditis elegans*, out of 1090 cells generated, exactly _____ number of cells undergo programmed celled death
   a. 131 b. 113 c. 111 d. 133

7. Which ratio is constant for DNA ?
   a. A+T / G+C b. A+G / T+C c. A+C / U+G d. A+U / C+G

8. Nucleotide arrangement in DNA can be seen by
   a. Light microscope b. Electron microscope
   c. X-ray crystallography d. Ultracentrifuge

9. Which of the following enzymes remove supercoiling in replicating DNA ahead of the replication fork ?
   a. DNA polymerases b. Helicases c. Primases d. Topoisomerases

10. There is one amino acid for one genetic code. **True / False**

11. The allergic reaction is initiated by antibodies of the
    a. IgG group b. IgM group c. IgA group d. IgE group

12. Vacca in 'Vaccine' means
    a. Cow b. Goat c. Sheep d. Horse

13. Antibodies produced from clones of a single_____ are called monoclonal antibodies.
    a. T cells b. B cells c. NK cells d. CT cells

14. The length of one turn of DNA is
    a. 3.4 A^0 b. 34 A^0 c. 20 A^0 d. 3.04 A^0

15. Systemic lupus erythematosus is an _____ disease.

PART B

II. Answer any FIVE of the following **5 X 5 = 25**

16. What is the principle of phase contrast microscope? Mention its advantages.
17. With a neat labelled diagram, list the functions of Golgi apparatus.
18. What is polyteny? Explain the significance of puffing in polytene chromosome.
19. Mention any two tumor suppressor genes and its role in preventing a cell from becoming malignant.
20. What are the variant forms of DNA? List out the differences between them.
21. Explain Wobble hypothesis and add a note on the degeneracy of the triplet codon.
22. Explain the role of B Lymphocytes in immune response.

PART C

III. Answer any THREE of the following **3 X 10 = 30**

23. Write short notes on:
    i. The transportation of small ions and molecules across the plasma membrane against the concentration gradient.
    ii. Functions of Rough and Smooth Endoplasmic reticulum.

24. Explain the procedure involved in the Karyotype preparation of Human chromosomes and add a note on any two banding techniques.
25. What is chromosome aberration? Give an account of translocation.
26. Explain the following sequence in a cell:
    DNA formats RNA, which makes proteins.
27. What is transplantation? Explain the different types of grafts.
