Reg. No ..... Name .....

**M. Sc DEGREE END SEMESTER EXAMINATION - MARCH 2020**

**SEMESTER 2 : BOTANY**

COURSE : **16P2BOT06 : MOLECULAR BIOLOGY AND IMMUNOLOGY**

***(For Regular - 2019 Admission & Supplementary 2018/2017/2016 Admissions)***

Time : Three Hours Max. Marks: 75

**Section A**

**Answer any 8 (2 marks each)**

1. How triplex DNA is differentiated from quadruplex DNA?
2. What is Ames test?
3. How hammerhead ribozymes are peculiar?
4. Comment on Ac and Dc elements in transposition.
5. Write a short note on tautomeric forms of nitrogen bases.
6. What are enhancers and silencers?
7. What are the various types of post translational modifications?
8. Briefly explain mechanism of mRNA export from nucleus to the cytoplasm.
9. What do you mean by operon? What are the various types of operons?
10. What is si RNA?
11. What is phagocytosis? Explain its significance and types.
12. What is the role of interleukin I?

(2 x 8 = 16)

**Section B**

**Answer any 7 (5 marks each)**

13. Explain the mechanism of replication in telomeres.
14. How retrotransposons are unique in their mechanism?
15. Explain excision repair mechanism in DNA repair.
16. Briefly explain RNA polymerase I promoters.
17. Explain the process of insertion of proteins into ER membrane.
18. With the help of a diagram, explain the structure of eukaryotic ribosome with special reference to their activity sites.
19. Briefly explain how transcriptional activators and repressors are involved in chromatin remodelling.
20. Explain the mechanism of inflammation.
21. What are VDJ genes? What is their role in antibody diversity?
22. Discuss the history of evolution of vaccine.

(5 x 7 = 35)

**Section C**
**Answer any 2 (12 marks each)**

23. Explain the molecular mechanism of DNA replication initiation in eukaryotes.

OR

24. Briefly explain the various mechanisms by which translation is regulated?

25. Draw a typical eukaryotic gene and the pre-mRNA and mRNA derived from it. Assume that the gene contains three exons. Identify the following items and for each item, give a brief description of its function:
    a) 5' untranslated region
    b) promoter
    c) AAUAAA sequence
    d) Transcription start site
    e) 3'untranslated region
    f) Introns
    g) Exons
    h) Poly(A) tail
    i) 5'Cap

OR

26. How antigen processing and presentation works?

(12 x 2 = 24)