b) What are cohort groups ? Where are they used. 4

c) What is pasteurization ? Mention the two different pasteurization processes with their conditions. 3

d) Define the following :

i) Herd immunity 1

ii) Incidence 1

iii) Entomological Warfare 1

Ex/MSBT/2/4A/58/2018

M. Sc. Bio-Technology Part II Examination, 2018

Medical Biotechnology

Paper - 2/4A

Time : Four hours Full Marks : 100

Use a separate Answer-Script for each Group

GROUP - A

Answer ***any four*** questions :

1. a) What is submit vaccine ? Give examples of Polysaccharide vaccines. How subunit vaccine against Herpes simplex virus can be developed ?

   b) How vaccinia virus is modulated to deliver vaccine ? Why deletion of K3L gene of such virus is necessary ?

   (2+2+5)+(4+3)

2. a) When is interphase FISH more helpful than metaphase ? What is SKY ? What kinds of chromosomal transformations is SKY used for ? How FISH technique can be used for the measurement of telomere length ?

   b) What is the advantage of DNA based diagnosis ? Illustrate the procedure involved for the detection of Fragile X syndrome ? How Oligonucleotide ligation assay can be used for the detection of mutation.

   (1+1+2+3)+(3+3+3)

3. a) Why it is necessary to produce human therapeutic proteins in bacteria ? What is the advantage of production of human growth hormone in bacteria ?

   b) Why humanize antibody is essential for therapeutic purpose, give examples. How such antibody is produced in bacteria ? How Pseudomonas exotoxin is used for killing HIV infected Th cells. (3+3)+(2+5+3)

4. a) Give some examples of transgenic animals which produce human therepeutic agents ? How transgenic animal is developed using DNA microinjection method ? What is the limitation in this method ?

   b) How transgene expression can be controlled ? Give some example of inducible expression system that usually employ in transgenic animals ? What is the advantage of this system. (3+4+2)+(3+3+1)

5. a) What should be the critically consider before the development of gene therapy agents ? How retrovirus is modified to develop ex vivo gene delivery agents ?

   b) What are the advantages of using Adeno Associated Virus for invivo gene therapy ? How they can be produced ? Outline the feature of non viral gene delivery system. (2+6)+(2+4+2)

   iv) On which organism(s) do you think this drug will act on and explain with diagram when can the drug be applied. 4

   v) Define disease burden. 2

9. a) What is Glycogenesis ? How many types of this disease exist ? 2

   b) What type of disease is McArdle Disease ? Why is it caused ? Mention two symptoms of the patients suffering from this disease. 4

   c) What is the mode of action of Gamma Rays in physical control of microorganisms. 4

   d) Give one use of Gamma Rays in physical control of microorganisms. 1

   e) What are the ideal characteristics of a biological agent to be used as a weapon against humans ? 2

   f) Mention three factors on which the selection of chemotherapeutic agent relies on. 3

10. a) Sulfonamides inhibit the synthesis of Tetrahydrofolic acid.

   i) How is tetrahydrofolic acid synthesized ? 2

   ii) How does sulfonamide inhibit its synthesis ? Explain with diagrams. 4

6. Write short notes on (***Any two***) :

   a) Nucleic acid ad therapeutic agent

   b) Liquid biopsy

   c) Crisper-Cas in genome editing. (8+8)

GROUP - B

Answer ***any two*** questions : (16 marks each)

7. a) What do you mean by Biosafety Level ? 1

   b) What features makes BSL-2 different from BSL-1 ? 4

   c) Why is it so difficult to find antimicrobialagents for treating viral disease ? 2

   d) Zidovudin is an antiviral antibiotic. Describe its mode of action. 4

   e) Distinguish between High Level, Intermediate level and Low level disinfectants. 3

   f) What is Biological Warfare ? 2

8. a) When is epidemic declared ? 1

   b) What are the objectives that need to be considered during investigation of an epidemic. 4

   c) The effect of a drug X is a rapid schizontocidal action.

      i) What is meant by schizontocidal action. 1

      ii) To what kind of patients would a doctor prescribe this drug. 1

      iii) What is the mode of action of this drug X on molecular level 3