UNIVERSITY OF BALOCHISTAN QUETTA
MA / MSc (ANNUAL) EXAMINATION .2014.

Attention:- 1- Possession & Use of mobiles & other electronic accessories are strictly prohibited . If any one possess / uses , his /her case will be sent to unfair means committee.

2- If any candidate show / Marks his / her identity in the answer book , he / she will be disqualified for the said paper .

Subject:- **MICROBIOLOGY** Paper:- X **(Final)**

Marine Microbiology

Time Allowed :- 3 Hours Max : Marks : 75

Note :- Attempt any Five Questions in All But Question No. 1- in section –I is compulsory and the time for Section- I is only 40 Minutes. After Expiry of the Time paper should be handed over to the supervisory staff.

Q No 1 A Answer the following questions. Marks -15

a) Define Marine Microbiology.
b) Describe epilimnion.
c) What do you mean by ecosystem?
d) What are the main difference between eukaryote and prokaryote?
e) explain marine pollution
f) Describe fresh water pollution.
g) How will you control water pollution?
h) Define algae.
i) Explain the roll of water in disease control.
j) Define hypolimnion.

B Correct the following sentences.

a)Mine mata is a fresh water disease.

b)Aspergellosis is a viral disease

c)Ring worm is caused by fresh water E coli.

d) Ent amoeba histolytica is commonly found in fresh water and sea water.

e)Spirogyra is the disease of marine water.

Section 2 (Attempt any four Question) (Marks 15)

Q No 2. . Describe the stratification of lake in detail

Q No3 Enlist the main groups of microorganism belongs to fresh water and explain any one disease caused by fresh water microorganism.

Q No 4. Explain the procedure of fresh water sampling and bacterial culture.

Q No 5 what is the main difference between Nitrogen sulpher and phosphorus cycle,

Describe the Nitrogen cycle in detail.

.Q No 6 describes the carbon cycle in detail.

Q No7 writes short note any two of the following.

a) Advantages and disadvantages of fresh water
b) Biotechnology
c) Aqua culture.
d) Law of ecology with the reference to fresh water echo system.

UNIVERSITY OF BALOCHISTAN QUETTA
MA / MSc (ANNUAL) EXAMINATION .2014.

Attention:- 1- Possession & Use of mobiles & other electronic accessories are strictly prohibited . If any one possess / uses , his /her case will be sent to unfair means committee.

2- If any candidate show / Marks his / her identity in the answer book , he / she will be disqualified for the said paper .

Subject:- Microbiology

Paper: Soil microbiology ☒ Final (3Hours) Total Marks:75

Note: Attempt five Questions in all, including question No.1 which is compulsory. The time allowed for Section-1 is 40 minutes, after 40 minutes papers should be handed over the supervisory staff. The time for Section 2 is 02:20 minutes.

Section-1

Q. No.01. Define the following. (Any 15)

1. Cumulous soil.
2. Soil weathering.
3. Formation of compost.
4. Mineralization.
5. Lacustrine.
6. Morians.
7. Soil conservation.
8. Humus and compost.
9. Antagonism and synergism.
10. Inorganic part of soil.
11. Transported soil.
12. Describe physical and chemical composition of soil.
13. Mycorrhizae
14. Define mutualism and give example.
15. Role of nitrosomonas in soil.
16. Nitrogen fixation.
17. What is chemical decomposition?
18. Plant microbe interaction
19. Pedogenesis
20. Soil erosion

Section-2

MARKS 60 TIME ALLOWED 2:20

Note:- Attempt any four Questions. All questions carry equal marks.

2. Give note on soil formation. Describe various soil horizons and soil factors.
3. What is difference between humus and compost? How is compost formed? Explain
4. What do you mean by the term soil conservation? Discuss in detail various soil conservation methods.
5. Write a detailed note on Nitrogen cycle. Explain with examples role of microbes in nitrogen cycle.
6. What do you know about biogeochemical cycles? Describe in detail mineral transformation with special reference to sulfur cycle.
7. What do you know about water logging? What parameters can be used in salinity management? Also discuss economical impact
8. Enlist signification micro flora of soil. Explain advantages and disadvantages of soil microbes.

UNIVERSITY OF BALOCHISTAN QUETTA
MA / MSc (ANNUAL) EXAMINATION .2014.

Attention:- 1- Possession & Use of mobiles & other electronic accessories are strictly prohibited If any one possess / uses , his /her case will be sent to unfair means committee.

2- If any candidate show / Marks his / her identity in the answer book , he / she will be disqualified for the said paper .

VIII Final

Subject: Microbiology

Paper: Diagnostic Microbiology Total Marks: 75

Note: Attempt six Questions in all, including question No.1 which is compulsory. The time allowed for Section-1 is 40 minutes, after 40 minutes papers should be handed over the supervisory staff. The time for Section 2 is 02:20 minutes.

Section-1

Q N0 1 (a). Differentiate the following (10)

a. Serum and Plasma.
b. Hepatitis and Encephalitis.
c. Haematuria and Haemtopoises.
d. Pyuria and Cystitis.
e. Blood pH and Blood Proteins.

Q No 1 (b) Define any six (5)

1 Erthropoiesis
2 Neutropenia
3 Reactive leukocytosis
4 Rh antigen.
5 Christmas factor
6 Normal ranges of Platelets
7 Lymphocytosis
8 Haemocytometer
9 ESR and MCH

Section-2 Time allowed 2hr.20mints Marks 60

Attempt any 5 Questions each question carries 12 marks

Q. No.2. Write in detail functions of blood and discuss blood cells formation

Q.No.3. What is Anemia classify it as well?

Q.No.4. Write down ABO blood group and fitness criteria for a blood donor.

Q.No.5. What is Hemoglobin, its types, abnormalities and normal values?

Q.No.6. Describe granulocytes, their functions and relative concentration in blood.

Q.No.7. Define hemophilia. Narrate its types and symptoms.

Q.No.8. Discuss major theories of blood coagulation.

Q.No.9 Define sickle cell anemia, its pathophysiology and diagnosis.

Q.No.10 Discuss Thalassemia, its types and treatment.

UNIVERSITY OF BALOCHISTAN QUETTA

MA / MSc (ANNUAL) EXAMINATION .2014.

Attention:- 1- Possession & Use of mobiles & other electronic accessories are strictly prohibited . If any one possess / uses , his /her case will be sent to unfair means committee.

2- If any candidate show / Marks his / her identity in the answer book , he / she will be disqualified for the said paper .

Subject:- **MICROBIOLOGY** Paper:- X **(Final)**

Marine Microbiology

Time Allowed :- 3 Hours Max : Marks : 75

Note :- Attempt any Six Questions in All But Question No. 1- in section --I is compulsory and the time for Section- I is only 40 Minutes. After Expiry of the Time paper should be handed over to the supervisory staff.

Section – I (15 Marks)

Q. No. 1. Short questions. Attempt any (15) questions out of 20 all questions. Each question carry equal marks.

1.	Define term microorganism	01
2.	What is oceanic basin?	01
3.	Define term marine life	01
4.	What is meant by fauna?	01
5.	Enlist four important marine bacteria	01
6.	What are coral reef?	01
7.	Define term marine	01
8.	Define oceanic climate	01
9.	Define term denitrification	01
10.	What are auxotrophs?	01
11.	Define biotechnology	01
12.	What is meant by cold seep?	01
13.	What is aphotic zone?	01
14.	How decomposers play their role?	01
15.	Define food chain	01
16.	Define term "Benthic microbes"	01
17.	Define lysogeny	01
18.	How marine bacteria obtain energy?	01
19.	What is PFGE?	01
20.	Define the term microbial interaction	01

Section – II

MARKS 60 TIME ALLOWED 2:20

Note: Attempt any Five Questions. All questions carry equal marks.

Q. No. 2	How marine microbes help in Nitrogen cycle?	10
Q. No. 3	What are the methods for isolation of oligobacteria	10
Q. No. 4	Define marine zonation and stratification in marine life	10
Q. No. 5	Explain the economic significance of marine microorganisms	10
Q. No. 6	What is the role of marine microbes in formation of biofilms?	10
Q. No. 7	Narrate the economic importance of marine microorganisms	10
Q. No. 8	What is the role of marine microbes in food chain	10
Q. No. 9	Name and classify important groups of marine microbes	10
Q. No. 10	What are microbial activity at hydrothermal vents	10
Q. No. 11	What do you understand by marine biotechnology and how it can be beneficial	10

UNIVERSITY OF BALOCHISTAN QUETTA
MA / MSc (ANNUAL) EXAMINATION .2014.

Attention:- 1- Possession & Use of mobiles & other electronic accessories are strictly prohibited . If any one possess / uses , his /her case will be sent to unfair means committee.

2- If any candidate show / Marks his / her identity in the answer book , he / she will be disqualified for the said paper .

Subject:- Microbiology
Paper: Medical Microbiology XI Final Total Marks:75

Note: Attempt seven Questions in all, including question No.1 which is compulsory. The time allowed for Section-1 is 40 minutes, after 40 minutes papers should be handed over the supervisory staff. The time for Section 2 is 02:20 minutes.

Section-1

Q. No.01 Short questions. Attempt any 15 Questions out of 20. Each Question carries equal marks.

15 Marks

1) Pathogenesis
2) Neurotoxin
3) MRSA
4) STD
5) Invasiveness
6) gonococcus infection.
7) Shigellosis.
8) Tertiary Malaria.
9) Multi Drug Resistant Bacteria.
10) Antigenic Drift
11) Genetic recombination
12) PPD
13) Hepatitis
14) Enriched media
15) Differentiate between sign and symptoms
16) Heamagglutination
17) Nagri bodies
18) immunization
19) Epidemics
20) Differentiate between Disease and infection

SECTION 2

Note: Attempt any six (6) questions. Each question carries equal marks.

60 Marks

Q 1. Describe the normal microbial flora of human body. Discuss their importance.

Q 2. Define Medical Microbiology? Enlist ten (10) bacterial diseases with their causative agents.

Q 3. Explain the pathogenesis of malaria. On what ground you classify the malaria?

Q 4. What is diarrhea? Write down the names of bacteria and viruses which cause diarrhea (At least 5 each).

Q. 5. Write down name of medically important Bacteria of Enterobacteriaceae family. Why they are important human pathogens?.

Q. 6 Write about the description and pathology of diseases caused by intestinal flagellate Giardia lamblia.

Q. 7. What are the different types of Salmonella infection? Describe Typhoid fever in details.

Q. 8. Explain the important properties, laboratory diagnosis and treatment of Mycobacterium tuberculosis.

Q. 9. What is skin scalded syndrome? Describe important characteristics, Laboratory diagnosis and treatment of S. aureus.

Q. 10. Write notes on any two of the followings .(1) Influenza virus (2) AIDS (3) Tetanus

UNIVERSITY OF BALOCHISTAN QUETTA

MA / MSc (ANNUAL) EXAMINATION .2014.

Attention:- 1- Possession & Use of mobiles & other electronic accessories are strictly prohibited . If any one possess / uses , his /her case will be sent to unfair means committee.

2- If any candidate show / Marks his / her identity in the answer book , he / she will be disqualified for the said paper .

Subject:- **(MICROBIOLOGY)** Paper:- **XII (Final)**

Bioinformatics and Biotechnology.

Time Allowed :- 3 Hours Max : Marks : 75

Note :- Attempt any Five Questions in All But Question No. 1- in section –I is compulsory and the time for Section- I is only 40 Minutes. After Expiry of the Time paper should be handed over to the supervisory staff.

SECTION –I (OBJECTIVE PORTION 20 MARKS)

Q.No.1 (a) Define the following

1- MSA Medium
2- Industrial Biotechnology
3- Food Sportage.
4- PDB (Abbirate)
5- Sequence Alignment.
6- Hybridization

(b) Write short note on any one of the following.

1- Composition of Milk.
2- Cryogenic freezing
3- Bacterial Spores

SECTION –II(SUBJECTIVE PORTION 80 MARKS) TIME ALLOWED 2:20

Attempt any Four (04) questions.

Q.No.2 Explain in detail the mechanism and application of formatation.

Q.No.3 How will you use the NCBI. Explain it's sizinfact role in the field of Biotechnology.

Q.No.4 How will you predict the structure of a protein molecule using Bioinformatics food?

Q.No.5 Explain in detail the mechanism of food spilage. How will you preserve food?

Q.No.6 What are the problems faced in preservation of Milk in tropical countries.?

Q.No.7 Using DNA/ protein modeling how are phylogenetic frees constructed.?

UNIVERSITY OF BALOCHISTAN, QUETTA.

Attention :- 1- **Possession & use of mobiles & other electronic accessories are strictly prohibited . If any one possess / Uses , His /Her case will be sent to Unfair means committee.**

2- **If any candidate shows / Marks his / her identity in the Answer Book , He / She will be disqualified for the said paper .**

I

M.Sc Previous (ANNUAL) EXAMINATION 2014

Subject:- Microbiology

Paper: General Microbiology Total Marks:75

Note: Attempt five Questions in all, including question No.1 which is compulsory. The time allowed for Section-I is 40 minutes, after 40 minutes papers should be handed over to the supervisory staff. The time for Section 2 is 02:20 minutes.

Section I

Q No.1. Briefly attempt any fifteen (15) from the following. (15)

i. Define bacterial growth?
ii. What are the differences between eubacteria and archae bacteria?
iii. What are the function of dipcolinic acid and calcium in endospore?
iv. What is pure culture?
v. Differentiate between alkalophiles and neutrophils
vi. Differentiate between sanitization and sterilization
vii. What is plasmid?
viii. What is the mode of action of penicillin?
ix. What is the function of magnetosome?
x. Enlist the names of mechanisms by which recombination occurs in bacteria.
xi. What is bacteriophage?
xii. Differentiate between bacteria and fungi on the basis of their cell wall.
xiii. Define disinfection.
xiv. Define Aeromicrobiology
xv. What is balance growth?
xvi. Define chemotaxis.
xvii. What is the purpose of agar in bacteriological medium?
xviii. Define differential media.
xix. Define transduction
xx. Write is the main difference between Gram positive and Gram negative bacteria?

Section II

Attempt any four (4) questions. All questions carry equal marks (60)

Q No. 2. How you can control the microorganisms by physical factors? Explain the mechanism of one physical factor for control of microorganisms in detail.

Q No.3. What are antibiotics? Briefly explain their different mode of action.

Q No. 4. What is conjugation? Briefly describe its process.

Q No. 5. Why the cell wall is necessary for the survival of most of the bacterial cells? Explain the cell wall of Gram positive bacteria in detail.

Q No. 6. Microorganisms are more beneficial or harmful? Justify with the suitable examples.

Q No. 7. Enlist the Koch's postulates. Elaborate the work and findings of Louis Pasteur and Robert Koch in development of Microbiology as a science.

Q No. 8. What is protoplast? Explain the inclusion bodies of prokaryotic cell with their function.

Q No. 9. (A) Briefly explain the nutritional types of microorganisms.

(B) Explain the exponential phase of growth curve.

UNIVERSITY OF BALOCHISTAN QUETTA
MA / MSc (ANNUAL) EXAMINATION .2014.

Attention:- 1- Possession & Use of mobiles & other electronic accessories are strictly prohibited . If any one possess / uses , his /her case will be sent to unfair means committee.

2- If any candidate show / Marks his / her identity in the answer book , he / she will be disqualified for the said paper .

Subject:- **MICROBIOLOGY** Paper:- II **(Prev)**

Microbial Genetics

Time Allowed :- 3 Hours Max : Marks : 75

Note :- Attempt any Six Questions in All But Question No. 1- in section –I is compulsory and the time for Section- I is only 45 Minutes. After Expiry of the Time paper should be handed over to the supervisory staff.

SECTION –I (OBJECTIVE PORTION 15 MARKS)

Q NO 1 Write short note on any fifteen of the followings 15

1- Define non sense mutation
2- What is Oogenesis
3- Define episome
4- Define spermatogenesis
5- Define transfer RNA
6- What is epistasis
7- What is conjugation
8- What is difference between dominance and semi dominance
9- What is sex influenced dominance
10- Define suppressor mutation
11- What is repression
12- Define non- sense mutation
13- What is codominance
14- define lampbrush chromosomes
15- DefineOocytes
16- What is transduction
17- Define translation

SECTION –II(SUBJECTIVE PORTION 60 MARKS) TIME ALLOWED 2:15

Attempt any Five (05) questions.

Q NO 1	What do you know about DNA repair mechanism discuss	12
Q NO 2	What is transposons and discuss the medical significance of bacterial transposons	12
Q No 3	Define mutation and write a comprehensive note on induced mutation	12
Q NO 4	How protein synthesis occurs in cell at different location discuss	12
Q NO 5	What do you know about the Watson and Crick Double Helix support your answer with evidence	12
Q NO 6	Discuss in detail semi conservative Replication of Eukaryotic chromosomes	12
Q NO 7	Define DNA and RNA , briefly discuss the difference between DNA and RNA	12
Q NO 8	Write a detailed note on conjugation	12

UNIVERSITY OF BALOCHISTAN QUETTA
MA / MSc (ANNUAL) EXAMINATION .2014.

Attention:- 1- Possession & Use of mobiles & other electronic accessories are strictly prohibited . If any one possess / uses , his /her case will be sent to unfair means committee.

2- If any candidate show / Marks his / her identity in the answer book , he / she will be disqualified for the said paper .

III Previous
Subject: Microbiology
Paper: General Immunology

Time Allowed: 3 hours Max. Marks: 75

Note: Attempt five questions in all, including question No. 1 in section-I which is compulsory. The time allowed for Section-I is 40 minutes. After expiry of the time paper should be handed over to the supervisory staff. The time allowed for Section-2 is 2 hours & 20 minutes.

SECTION-I (15 MARKS)

Q. No.1 Short questions. Attempt any five questions and each question carries equal marks.

i. Define Apoptosis?
ii. Define super antigen?
iii. What are opsonins?
iv. Write down the primary/central lymphoid organs.
v. What are natural antibodies?
vi. Enlist the physical barriers of innate immunity?
vii. Draw and label the structure of Immunoglobulin G (IgG).
viii. What are haptens?
ix. What is Chemotaxis?
x. What is the role of inflammation in innate immunity?

SECTION-2 (60 MARKS)

Note: Attempt any four questions. All question carry equal marks.

Q. No. 2 Give an account of different types of hypersensitivity reactions.
Q. No. 3 Give an account of major characteristics of antigens.
Q. No. 4 Write down the importance of Plasma cells, Neutrophils, Mast cells and Eosinophils in immunity?
Q. No. 5 Write a comprehensive note on Histocompatibility complex.
Q. No. 6 Explain the process of cell mediated immunity.
Q. No. 7 Write a brief note on any three of the following.
(i) Autograft, Isograft and Xenograft (ii) Mucosa-associated lymphoid tissue (MALT)
(iii) Agglutination technique (iv) Classical Complement Pathway (v) Immunoflourescence technique
Q. No. 8 Describe in details autoimmunity?
Q. No. 9 Explain the functions of interferons and cytokines.
Q. No. 10 Write a comprehensive note on reticule-endothelial system (RES).

UNIVERSITY OF BALOCHISTAN QUETTA
MA / MSc (ANNUAL) EXAMINATION .2014.

Attention:- 1- Possession & Use of mobiles & other electronic accessories are strictly prohibited . If any one possess / uses , his /her case will be sent to unfair means committee.

2- If any candidate show / Marks his / her identity in the answer book , he / she will be disqualified for the said paper .

IV Previous

Subject:- Microbiology

Paper: General Mycology Total Marks:75

Note: Attempt Six Questions in all, including question No.1 which is compulsory. The time allowed for Section-1 is 40 minutes, after 40 minutes papers should be handed over the supervisory staff. The time for Section 2 is 02:20 minutes.

Section-1

Q. No.01 write short answers of any fifteen (15) of the followings.

1. Differentiate between Mycotoxin and Mycoses
2. Differentiate between Thermophile and Mesophil
3. What is Tinea capitis
4. Differentiate between Rhizosphere and rhizophus
5. Differentiate between Dermatophytes and dermatomycoses
6. Differentiate between Yeast and mold
7. Differentiate between Spore and sporogenesis
8. Define Budding
9. Write three characteristics of basidiomycetes
9. What is fungal growth media
10. Define Fermentation
11. What are Zoospores
12. What is parasitic fungi
13. Define Mycorrhiza
14. Differentiate between aerobic and anaerobic fungi
15. What is Rust
16. What is Coenocytic hyphae
17. What are Antibiotics
18. Define Bioremediation
19. What is effect of PH on growth of fungi
20. Define fungal cell wall

Section-2

MARKS 60 TIME ALLOWED 2:20

Note:- Attempt any five Questions. All questions carry equal marks

Q2. Discuss the physical factors that effect the growth of fungi?
Q3. What are Mycotoxins? Explain their types in detail.
Q4. Explain life cycle of Puccinia graminis with labelled diagram?
Q5. Write a detailed note on fungal metabolism?
Q6. How fungi is important to human beings?
Q7. What are the methods of sexual and asexual reproduction in fungi?
Q8. Write a note on classification of fungi?
Q9. Define Dermatomycosis with reference to Tinea corporis?

UNIVERSITY OF BALOCHISTAN QUETTA

MA / MSc (ANNUAL) EXAMINATION .2014.

Attention:- 1- Possession & Use of mobiles & other electronic accessories are strictly prohibited . If any one possess / uses , his /her case will be sent to unfair means committee.

2- If any candidate show / Marks his / her identity in the answer book , he / she will be disqualified for the said paper .

Subject:- **MICROBIOLOGY** Paper: V (Prev)

(Environmental Microbiology & Bio Statistics)

Time Allowed :- 3 Hours Max : Marks : 75

Note :- Question No-1 in Section I & II is compulsory and time is only 40 minutes. After expiry of time paper should be handed over to the supervisory staff.

Part-A Environmental Microbiology (Marks 50)

Section-I

1	Write short notes on any TEN of the following: (a) Phytoplankton and zooplanktons (b) Characteristics of viruses (c) Food Web (d) AIDS (e) Koch's Postulates (f) Chemotherapy (g) Biodegradation (h) Viroid (i) Mineralization (j) Coliform and Chlorine (k) Biological Oxygen Demand (BOD) (l) Photic Zone (m) Potable Water (n) Eutrophic and Oligotrophic	10 x 1= 10

Section-II

Attempt any FOUR questions. All questions carry equal marks.

2	What is pollution? What kinds of pollutants contaminate our environment?	10
3	Water purification plays pivotal role in municipal water supplies, support or rejects the assumption on the basis of solid evidences.	10
4	What are the sources of waste water? Briefly describe the primary and secondary waste water treatments.	10
5	Which bacteria could be used as indicator for bacterial contamination in drinking water?	10
6	Define diurnal periodicity pattern. Explain the dispersal of airborne microorganisms.	10
7	What are Bio-fertilizers?	10

Part-B Biostatistics (Marks 25)

Section-I

1	Briefly answer any five (05). (Compulsory) a) Standard Deviation b) t-Test Analysis c) Biostatistics d) Define A.M, G.M and H.M. e) Rank correlation f) Comparative Genomics g) Threading h) Energy minimization i) Mode and Median j) Range and quartile deviation	5x3=15

Section-II

Attempt and TWO (02) questions from this section.

2	Prove that standard deviation and variance change the original scale.	05
3	Explain the methodology of Peptide Sequencing using mass and spectroscopy data.	05
4	What is a database? Discuss about different types of database and add a note on their significance.	05
5	Define sampling mean distribution.	05

UNIVERSITY OF BALOCHISTAN QUETTA
MA / MSc (ANNUAL) EXAMINATION .2014.

Attention:- 1- Possession & Use of mobiles & other electronic accessories are strictly prohibited . If any one possess / uses , his /her case will be sent to unfair means committee.

2- If any candidate show / Marks his / her identity in the answer book , he / she will be disqualified for the said paper .

Subject:- Microbiology

Paper: General virology and Cell culture (VI Paper) Total Marks:75

Note: Attempt five Questions in all, including question No.1 which is compulsory. The time allowed for Section-1 is 40 minutes, after 40 minutes papers should be handed over the supervisory staff. The time for Section 2 is 02:20 minutes.

Section-1

Q. No.01 Short questions. Attempt any 15 Questions. Each Question carries equal marks.

1. What kind of medium is required for cell culture?
2. What are general properties of a monolayer?
3. How can you define term organogenesis?
4. Differentiate between Primary and Secondary cell line.
5. Name four stages of micropropagation?
6. What do you know about harvesting of cells?
7. Define suspension growth of cells.
8. What is pluripotency?
9. What is the primary function of dimethylsulfoxide medium.
10. What is plaque assay?
11. What are basic steps of thawing?
12. What is the principle of HI test.
13. What is the difference between viruses and bacteriophage?
14. Name four animal viruses.
15. What are the types of cell culture?
16. Define negative strand viruses.
17. What are the diagnostic procedures of viruses?
18. What are general properties of RNA viruses?
19. Why do we perform HA test?
20. Name two established cell lines.

Section-2

MARKS 60 TIME ALLOWED 2:20

Note:- Attempt any four Questions. All questions carry equal marks

2. What do you know about stem cell technology? Explain in detail the types and application of stem cells.
3. What is cell strain? Explain different methods of establishing cell line, with special reference to HeLa cells.
4. Write down the special requirements of nutrients for the growth and metabolism of cells? Give a detailed description of serum free medium.
5. What are the different viral diagnostic procedures? Explain Heam agglutination method and plaque assay.
6. Explain in detail the lytic and lysogenic cycle.
7. What is chick embryo culture? Explain different inoculating routes and its significance.
8. How can you differentiate between RNA and DNA viruses? Discuss in detail viral families with respect to Baltimore classification.