The West Bengal University of Health Sciences
3rd BMLT September, 2023 Examination

Subject: Clinical Biochemistry

Time: 3 hrs. **Full Marks: 100**

*Attempt **all** questions*

1. Answer all the questions : 20 x 1

a) What does QA and QC stand for?
i) Quality assurance and quality control ii) Quality assurance and quality completion
iii) Both of these iv) None of these

b) Which technique separates charged particles using electric field?
i) Hydrolysis ii) Centrifugation iii) Electrophoresis iv) Both ii) and iii)

c) The speed of migration of ions in electric field depends upon:
i) Shape and size of the molecule ii) Magnitude of charge and shape of molecule
iii) Magnitude of charge and mass of molecule iv) Both i) and ii)

d) Which of the following option involves material and component control?
i) Development of standards ii) Development of specification iii) Quality control iv) Feedback

e) Process control is carried out:
i) Before production ii) During production iii) After production control iv) All of these

f) The mean sampling distribution is:
i) Less than mean process distribution ii) More than mean process distribution
iii) Equal to mean process distribution iv) Both ii) and iii)

g) When is electrophoresis not used?
i) Separation of proteins ii) Separation of lipids
iii) Separation of nucleic acid iv) Separation of amino acids

h) Nucleic acids cannot be separated by:
i) SDS-PAGE ii) Native PAGE iii) Agarose gel electrophoresis iv) Both i) and ii)

i) The pH of the stacking gel in SDS-PAGE is:
i) 7.0 ii) 6.8 iii) 8.0 iv) None of these

j) In electrophoresis DNA will migrate towards:
i) Cathode or positive electrode ii) Anode or negative electrode
iii) Cathode or negative electrode iv) Anode or positive electrode

k) The most common type of gel used for DNA separation:
i) Agar ii) Polyacrylamide iii) Agarose iv) Cellulose

l) In SDS-PAGE separation is based on:
i) Molecular weight ii) Shape iii) Charge iv) All of these

m) Chromatography is a physical method that is used to separate:
i) Simple mixtures ii) Complex mixtures iii) Viscous mixtures iv) Metals

n) Which force is involved in chromatography:
i) Hydrogen bonding ii) Electrostatic interaction
iii) Hydrophobic interaction iv) All of these

o) Ion exchange chromatography is based on:
i) Electrostatic interaction ii) Electrical mobility of ionic species
iii) Partition chromatography iv) All of these

p) Primer used for the process of polymerase chain reaction are _____
i) Single stranded DNA oligonucleotide ii) Double stranded DNA oligonucleotide
iii) Single stranded RNA oligonucleotide iv) Double stranded RNA oligonucleotide

q) Which of the following is not an application of ELISA?
i) Detection of hepatitis B markers in serum
ii) Percentage of Hb in blood
iii) Detection of HIV antibodies in blood sample
iv) Detection of mycobacterium antibodies in tuberculosis.

r) At what temperature does denaturation of DNA double helix takes place?
i) 60° ii) 54° iii) 74° iv) 94°

s) The technique used to transfer DNA molecules separated by gel electrophoresis to the nitrocellulose or nylon membrane is called_____
i) Western blotting ii) Northern blotting iii) Southern blotting iv) None of these

t) Reverse transcription PCR uses _____.
i) RNA as a template to form DNA ii) mRNA as a template to form cDNA
iii) DNA as a template to form ssDNA iv) all of these

2. Answer the following : 5 x 2
a) What is paper chromatography?
b) Write the usefulness of centrifugation.
c) What is ion-selective electrodes used for?
d) Define quality control protocol.
e) What is the clinical significance of cardiac troponin?

3. Answer ***any six*** of the following : 6 x 5
a) Distinguish between PCR and real time PCR.
b) Write a short note on two-dimension gel electrophoresis
c) Explain the relationship between quality control and quality management.
d) What is creatine kinase and what is its significance?
e) Explain the role of carbonic anhydrase in digestion
f) Write a short note on thin layer chromatography.
g) Distinguish between HPLC and HPTLC.
h) Name two isozymes and state their clinical significance.

4. Answer ***any one*** of the following: 1 x 10
a) Write a short note on clinical application of chemiluminescence.
b) What is proficiency testing? Define its role in laboratory processes.

5. Answer ***any two*** of the following : 2 x 15
a) Write short notes on:
i) Gel filtration chromatography ii) Sandwich ELISA iii) Prostate specific antigen
b) Enumerate the tests to diagnose HIV-AIDS. Enumerate on the various stages of the disease and for various objectives these tests are being used. 5+10
c) Distinguish between isoelectric focusing and SDS- PAGE.