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BRAINWARE UNIVERSITY

Term End Examination 2023

Programme – B.Sc.(MLT)-2020

Course Name – Special Techniques in Laboratory Science

Course Code - BMLT603

(Semester VI)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Chromatography is used to separate and analyze
- | | |
|---------------------|---------------------|
| a) Simple mixtures | b) Complex mixtures |
| c) Viscous mixtures | d) Metals |
- (ii) Select the following which is not used for column adsorption chromatography
- | | |
|----------------------|---------------------------|
| a) Magnesium oxide | b) Silica gel |
| c) Activated alumina | d) Potassium permanganate |
- (iii) Ion exchange chromatography is based on the _____
- | | |
|------------------------------|-----------------------------------------|
| a) Electrostatic attraction | b) Electrical mobility of ionic species |
| c) Adsorption chromatography | d) Partition chromatography |
- (iv) Monoclonal antibodies currently used clinically
- | | |
|---------------------------------------------------------------------------------|---------------------------------------------------------------------|
| a) Can protect against a wide variety of viruses and bacteria | b) Can reduce the inflammation associated with rheumatoid arthritis |
| c) Are derived from the plasma of individuals already immune to these organisms | d) Each have broad specificity for many antigenic determinants |
- (v) In reverse phase chromatography, the stationary phase is made _____
- | | |
|-----------------|------------------|
| a) Non-polar | b) Polar |
| c) Both a and b | d) None of these |
- (vi) Select the technique uses restriction enzyme digestion followed by agarose gel electrophoresis to generate a banding pattern for comparison to another sample processed in the same way?
- | | |
|---------|-------------------|
| a) qPCR | b) RT-PCR |
| c) RFLP | d) 454 sequencing |
- (vii) In Gas chromatography the carrier gas is _____
- | | |
|-------------------|------------|
| a) Carbon dioxide | b) Oxygen |
| c) Helium | d) Methane |

- (viii) Select the correct techniques is used to study the three-dimensional structure of a molecule?
- a) Infra-red spectroscopy
b) Mass spectrometry
c) UV-visible spectroscopy
d) X-ray crystallography
- (ix) Report the statement which is true for practicing SDS-PAGE?
- a) Staining with ethidium bromide allows visualization of results
b) It separates proteins by charge
c) The main ingredient in the gel is agarose
d) It requires a protein-denaturing gel
- (x) What is the first stage of the two-stage two-dimensional PAGE?
- a) SDS-PAGE
b) HPLC
c) Isoelectric focusing
d) Sedimentation
- (xi) Identify the isotopes which is not recognized as radioisotope?
- a) Carbon-13
b) Carbon-14
c) Tritium
d) Sulphur-35
- (xii) Soudium 24 is used clinically to examine
- a) blood circulation
b) lung function
c) lipid profile
d) kidney function
- (xiii) Rubidium 82 is used in typically as
- a) convenient PET agent for myaocardial perfusion
b) diagnosis of coronary artery diseases
c) glucose monitoring
d) All of these
- (xiv) Water content in human body can be detected through
- a) Fe 54
b) I-111
c) C14
d) H3
- (xv) Rem refers to
- a) biological damage measurement caused by radiation
b) water content measurement in human
c) Electrolyte measuement in body
d) None of these

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Describe the advantages of Capillary Electrophoresis in clinical aspect. (3)
3. Explain the function of RIA. (3)
4. Write the difference between Flow Cytometry and FACS analysis (3)
5. Explain the role of SDS in protein electrophoresis of SDS-PAGE. (3)
6. Analyze the various detection methods used in HPLC and their advantages and disadvantages. (3)

OR

Write the purpose of the secondary antibody in ELISA? (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Define Brachytherapy with example (5)
8. In case of Reverse phase chromatography the elute molecules are separated based on their polarity justify with proper explanation. (5)
9. Report Partition Co-efficient and correlate its equivalency in relation to chromatography (5)
10. Compare the working principle of both Chromatography and Electrophoresis. (5)
11. PCR is an Quantitive Method. Justify with proper explanation. (5)
12. Apply ELISA technique to estimate T4 in clinical diagnosis (5)

OR

Predict the advantages of using HPLC for thalassemia detection compared to other methods?

(5)
