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BRAINWARE UNIVERSITY

Term End Examination 2023

Programme – B.Sc.(MLT)-2019

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) Mention correct alternative about Hydraulic capacitance flow control system used in HPLC
 - a) It can be used only for liquids with low viscosity
 - b) It is irrespective of solvent compressibility
 - c) It maintains a constant flow
 - d) It smoothens high pressure pump pulsations
- (ii) 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
- (iii) 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
- (iv) Select the exact point where the FDA halt the development or use of gene therapy?
 - a) on submission of an IND application
 - b) during clinical trials
 - c) after manufacturing and marketing of the approved therapy
 - d) all of the answers are correct
- (v) The polymerization of PAGE in gel occurs with
 - a) N,N methylene acrylamide
 - b) N,N methylene bisacrylamide
 - c) acrylamide
 - d) N,N acrylamide
- (vi) The fluroscent dye EtBr binds with DNA via
 - a) stacked with histone molecules
 - b) binds to nucleotide base
 - c) intercalated between the stacked bases
 - d) binding with phsphodester bond

- (vii) In SDS-PAGE, protein sample is first treated with detergent sodium dodecyl sulfate (SDS), in order to
- a) Make the protein become negatively charged.
 - b) Make the protein become positively charged.
 - c) Renature the protein.
 - d) Adjust the pH of protein.
- (viii) In isoelectric focusing, proteins are separated on the basis of their
- a) relative content of positively charged residue only
 - b) relative content of negatively charged residue only
 - c) size
 - d) relative content of positively and negatively charged residue
- (ix) Western blotting is a technique of detection related to
- a) Specific protein in the sample
 - b) Specific lipid in the sample
 - c) Specific DNA in the sample
 - d) Specific RNA in the sample
- (x) DNA extraction requires _____ to lyse the epithelial cells and to degrade compounds inhibitory to amplification
- a) Freezing
 - b) Heat treatment
 - c) Enzyme
 - d) Mechanical shearing
- (xi) Name the reagent is commonly used for bacterial cell wall lysis
- a) CTAB
 - b) Phenol extraction
 - c) Lysozyme
 - d) Peniciline
- (xii) Pertaining to details surrounding release of patients after I-131 treatment, licensees must consider the _____.
- a) Extent of the patient's disease
 - b) Destination of the patient after release
 - c) Number of therapy sessions the patient has undergone
 - d) None of these
- (xiii) An instrument used to measure exposure to radiation is a
- a) Geiger counters
 - b) Roentgenograph
 - c) Spectrogram
 - d) Dosimeter
- (xiv) I-131 is taken up by thyroid tissue in the body because iodine is a constituent of thyroid _____.
- a) Hormone
 - b) Enzyme
 - c) Secretion
 - d) None of these
- (xv) Choose selecting to measure info on only one group of cells is known as
- a) Gating
 - b) B Cell Clonality
 - c) T Cell Clonality
 - d) cytotoxic T cells

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Identify the chromatography that makes use of biological-like interactions for the separation and specific analysis of sample components. Explain its principle. (3)
3. Identify the advanced molecular biology technique for DNA profiling (3)
4. Why we need to do sputter coating before sample viewing under SEM? Elaborate. (3)
5. What are some potential limitations or challenges associated with radioimmunoassay (3)
6. Explain the role of SDS in protein electrophoresis of SDS-PAGE. (3)

OR

- In an experiment sample A and B containing genomic RNA was measured through UV spectrometry at 540 nm wavelength. Analyze the result (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Define HPLC and its principle and applications. (5)

8. Write the usage of Mass Spectroscopy in biological research? Explain with example. (5)
9. Write the difference between Southern blot and Western blott. Define with suitable example (5)
10. Define the principle and application X-Ray Diffraction(XRD). Write its significance in molecular research. (5)
11. PCR is an Quantitive Method. Justify with proper explanation. (5)
12. Report Partition Co-efficient and correlate its equivalency in relation to chromatography (5)

OR

Predict the advantages of using HPLC for thalassemia detection compared to other methods? (5)
