

CBC-4282-W**B. Sc. (Third Semester) (End Semester)****EXAMINATION, Dec., 2021****FORENSIC SCIENCE****Paper-FSC-CC-311****(Instrumental Techniques in Forensic Science)***Time : Three Hours] [Maximum Marks : 60*

Note : The questions paper is divided into three Sections. Attempt questions as per direction.

Section—A**(Objective Type Questions)**

Note : Choose the correct option. Each question carries 1 mark. $10 \times 1 = 10$

1. Which of the following techniques is used when the boiling points of two liquids are close to each other ?

(a) Simple distillation

~~(b)~~ Fractional distillation

(c) Steam distillation

(d) Vacuum distillation

2. In the centrifugation process, the rate of particle sedimentation is proportional to the :

(a) Particle size

(b) Increased medium density

~~(c)~~ Increased medium viscosity

(d) Decreased gravitational force

3. Which of the following cuvetts is used for the detection of sample in UV range through UV-visible spectroscopy ?

(a) Glass cuvet

(b) Plastic cuvet

~~(c)~~ Quartz cuvet

(d) NaCl cuvet

4. In which of the following spectroscopic techniques, hollow cathode lamp is used as a light source ?

- (a) UV-visible spectroscopy
- (b) Infra-red spectroscopy
- (c) Atomic absorption spectroscopy
- (d) X-ray spectroscopy

5. Which of the following detectors is used in high pressure liquid chromatography ?

- (a) Thermal conductivity detector
- (b) Electrochemical detector
- (c) Flame ionisation detector
- (d) Bolometer

6. Which of the following chromatographic methods uses zeolite and dolomite for the separation of sample ?

- (a) Size exclusion chromatography
- (b) Affinity chromatography
- (c) Ion-exchange chromatography
- (d) Gas chromatography

7. Which of the following techniques is used for the transfer of protein from gel to nylon membrane ?

- (a) Eastern blotting
- (b) Western blotting
- (c) Southern blotting
- (d) Northern blotting

8. The role of SDS in SDS-PAGE electrophoresis method is :

- (a) to provide positive charge to the proteins.
- (b) to provide uniform pore size to the gel.
- (c) It allows the separation of larger protein molecules.
- (d) To break protein into its individual polypeptide subunits.

9. Which of the following microscopes has two eyepieces and two objective lenses ?

- (a) Compound microscope
- ~~(b) Comparison microscope~~
- ~~(c) Stereomicroscope~~
- (d) Electron microscope

10. Who invented comparison microscope ?

- ~~(a) Calvin Goddard~~
- (b) Max Knoll
- (c) Ernst Ruska
- (d) Fritz Zernike

Section—B

(Short Answer Type Questions)

Note : Attempt any *four* questions. Each question carries 5 marks. $4 \times 5 = 20$

1. Describe the types of rotors used in centrifuge.

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~~2.~~ Write about the interaction of radiation with matter.

3. Draw a labelled diagram of Coolidge tube and its significance.

~~4.~~ What do you understand by ion-exchange chromatography ?

~~5.~~ What are the significance of using agarose and polyacrylamide gels in electrophoresis ?

6. Write about the comparison microscope and its forensic significance.

Section—C

(Long Answer Type Questions)

Note : Attempt any *three* questions. Each question carries 10 marks. $3 \times 10 = 30$.

~~1.~~ What do you understand by extraction methods used for sample preparation ?

~~2.~~ How would you perform quantitative analysis through UV-visible spectroscopy ?

~~3.~~ What do you understand by high performance thin layer chromatography ?

4. Write the method of separation of DNA through electrophoresis and its forensic significance.
5. What is Magnification ? Describe various parts of comparison microscope and its forensic significance.

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