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SEAT No._____ No. of Printed Pages : 2

[78 & A-52]

SARDAR PATEL UNIVERSITY

B. Sc. (5th Semester) Examination (N C)

10-04-2018, Tuesday

02.00 P.M. To 05.00 P.M.

Subject: Microbiology - US05CMIC02

(Bioinstrumentation)

Note: (1) All the questions are compulsory. **Total Marks: 70**

(2) Figures on the right indicate marks.

Q.1 **Select the correct answer for each question from the options given below.** **(10)**

1 Which of the following is used as a detector in IR spectroscopy?
(a) Barrier cell (b) Golay cell
(c) Photo tube (d) Photo multiplier tube

2 In flame photometry, _____ is replaced by flame.
(a) Lamp (b) Light source
(c) Radiation source (d) Sample cell

3 In thermocouple, the end that is not exposed to any radiation is called _____.
(a) Hot Junction (b) Cold Junction
(c) Middle Junction (d) Extreme Junction

4 In SDS-PAGE, separating gel has pH _____stacking gel.
(a) Same as (b) Lower than
(c) Higher than (d) None of the above

5 In _____centrifugation, the gradient has maximum density below that of least dense sedimenting particle.
(a) Isopycnic (b) Rate zonal
(c) Sedimentation equilibrium (d) All of the above

6 Cation exchanger possesses _____ charged groups.
(a) Positively (b) Negatively
(c) Both (a) & (b) (d) None of the above

7 In gradient elution, _____ of the mobile phase is changed with respect to time.
(a) pH (b) Ionic strength
(c) Polarity (d) All of the above

8 In GLC, the carrier gas constitutes the _____.
(a) Stationary phase (b) Mobile phase
(c) Both (a) & (b) (d) None of the above

9 The sum of Protons & Neutrons in a nucleus is called _____.
(a) Mass number (b) Atomic number
(c) Sub atomic number (d) None of the above

10 _____ was the first bacterium to be sequenced in 1995.
(a) *Haemophilus influenzae* (b) *E.coli*
(c) *Bacillus megaterium* (d) *M.luteus*

Q.2 Give short answers to the following questions (Any Ten). (20)

1. Discuss the principle of emission flame photometry.
2. What is nephelometry?
3. Enlist various popular sources of IR radiation.
4. Write on native gel.
5. Discuss briefly methods for recovery of samples in density gradient centrifugation.
6. What are the differences between rate zonal and isopycnic centrifugation?
7. Discuss principle of gas liquid chromatography.
8. Draw schematic diagram of a typical HPLC unit.
9. What are the steps necessary for exchanger preparation in ion exchange chromatography?
10. Explain radioactive decay by alpha particle emission.
11. Enlist analytical applications of radioisotopes in biological sciences.
12. Define bioinformatics. Enlist the main branches of bioinformatics.

Q.3 Write in detail on principle, instrumentation and applications of UV. Visible spectroscopy. (10)

OR

Q.3 Discuss principle, instrumentation, method and applications of Atomic Absorption Spectroscopy. (10)

Q.4 (a) Describe electrophoretic procedure for SDS-PAGE. (5)
(b) Write on ultracentrifugation. (5)

OR

Q.4 (a) Discuss the basic principle of sedimentation. (4)
(b) Briefly describe Isoelectric Focussing. (6)

Q.5 Write a note on the following:
(a) Thin layer chromatography. (5)
(b) Affinity chromatography. (5)

OR

Q.5 (a) Write on molecular sieve chromatography. (5)
(b) Discuss principle and applications of ion exchange chromatography. (5)

Q.6 (a) Discuss about the scope of bioinformatics. (6)
(b) Write a note on structure and sequence databases. (4)

OR

Q.6 Define biosensor and describe various types of biosensors. (10)
