

19/A-17

SEAT No. \_\_\_\_\_

No. of Printed Pages : 2

**SARDAR PATEL UNIVERSITY**

**B. Sc. -5<sup>th</sup> Semester Examination**

**Microbiology :US05CMIC02**

**Bioinstrumentation**

Date: 8/4/2019  
Monday

Time: 10:00 a.m. to 1:00 p.m.

Total marks: 70

**N.B: All the question are compulsory.  
Figures on the right indicate marks.**

**Q.1 Choose the right option of the following multiple choice questions. 10**

- 1 A rotating wheel, interposed between the hollow cathode lamp and the flame is called \_\_\_\_\_.  
(a) Giant Wheel (b) Small Wheel  
(c) Chopper (d) None of the above
- 2 In thermocouple detector, the end that is not exposed to any radiation is called \_\_\_\_\_.  
(a) Hot Junction (b) Cold Junction  
(c) Middle Junction (d) Extreme Junction
- 3 Carbon atomizer is an example of \_\_\_\_\_.  
(a) Flame atomizer (b) Non flame atomizer  
(c) Low flame atomizer (d) None of the above
- 4 In \_\_\_\_\_ centrifugation, maximum gradient density is greater than that of the most dense sedimenting particle.  
(a) Isopycnic (b) Rate zonal  
(c) Sedimentation equilibrium (d) All of the above
- 5 In ultracentrifugation, the drive shaft on which the rotor is mounted is made of \_\_\_\_\_ alloy.  
(a) Aluminium (b) titanium  
(c) aluminium or titanium (d) None of the above
- 6 In GLC, the carrier gas constitutes the \_\_\_\_\_.  
(a) Stationary phase (b) Mobile phase  
(c) Both (a) and (b) (d) None of the above
- 7 In HPLC, guard column is installed between the injector and \_\_\_\_\_.  
(a) Pump (b) Detector  
(c) Analytical column (d) Recorder
- 8 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
- 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 \_\_\_\_\_ has low ionizing power but high penetration.  
(a)  $\alpha$ -particle (b)  $\beta$  (+) particle  
(c)  $\gamma$  rays (d)  $\beta$  (-) particle

**Q.2 Give short answers of the following questions (Attempt any Ten). 20**

- 1 What are the different regions of IR radiation?
- 2 Draw schematic diagram of Atomic Absorption Spectroscopy.
- 3 Write briefly on quadrupole mass analyser in mass spectroscopy.
- 4 Discuss ideal properties of gradient material used in density gradient centrifugation.
- 5 Write on Native gels.
- 6 What are the applications of ultracentrifugation.
- 7 Briefly discuss column packing material used in HPLC.
- 8 What are the different types of columns used for Gas chromatography.
- 9 Discuss the role of guard column in HPLC.
- 10 How radioisotopes are useful in ecological studies?
- 11 Define Bioinformatics. Enlist the main branches of it.
- 12 Enlist aim of bioinformatics.

**Q.3 Describe principle, instrumentation, working and applications of UV-Visible spectroscopy. (10)**

**OR**

**Q.3 Discuss principle, instrumentation and applications of IR spectroscopy. (10)**

**Q.4 Give detail account on principle, support medium, method and applications of SDS-PAGE. (10)**

**OR**

**Q.4 (A) Describe preparation of density gradients and recovery of samples in density gradient centrifugation. (5)**

**(B) Write on Isoelectric focussing. (5)**

**Q.5 Write a note on the following:**

(a) Thin layer chromatography (5)

(b) Molecular sieve chromatography (5)

**OR**

**Q.5 Discuss principle, working and applications of:**

(a) Affinity chromatography (5)

(b) Ion exchange chromatography (5)

**Q.6 Define biosensor and discuss different types of biosensors. (10)**

**OR**

**Q.6 (A) Enlist different types of radioactive decay and discuss any two in detail. (5)**

**(B) Describe analytical applications of radioisotopes. (5)**

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