Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 08

Ph.D in Faculty of Applied Science (CS)

LABORATORY PRACTICES AND SAFETY

M.Code : 77372

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT question.
2. Each question carry TWENTY marks.

1. a) What do you mean by significant figures? Discuss the various rules to identify significant figures. 10

   b) Differentiate in detail between Bias, Precision and Uncertainty. Define method detection limit and describe the procedure for the determination of method detection limit. 10

2. a) What is least square fit method? How do you find slope of the line of best fit? Discuss with suitable example. 5

   b) What is calibration and its types? Why is calibration so important? 5

   c) Calculate the standard deviation from the following distribution of marks by using all the methods. 10

Marks	> No. of Students
>1–3	>40
>3–5	>30
>5–7	>20
>7–9	>10

3. a) What is the role of desiccator? What types of chemicals are stored in desiccator? 5

   b) Differentiate between soft and heat resistant glasswares. Why calibration is required for glass wares? 5

   c) What is the difference between analytical balance and top loading balance? 5

   d) Why do we use volumetric flask, pipette and burette? Discuss the accuracy of these glasswares. 5

4. a) Write a short note on storage of chemicals and standards with suitable examples. 5

b) How do the quality of the reagent water assessed? 5

c) What are the differences between quality assurance and quality control, and discuss their benefits? 5

d) What do you understand by limit of detection? Discuss the methods for the determination of detection limits. 5

5. a) How do you prepare primary standard of potassium dichromate solution, 0.0417M? 5

b) A student pipets exactly 5.00 mL of 3.47 × 10–2 M $FeCl_3$ solution into a volumetric flask and adds enough water to make 250 mL of solution. What is the concentration of the diluted solution? 5

c) What is a reagent solution? What purpose does it serve? 5

d) How does a standard solution prepared from solid? 5

6. a) Write a short note on Soxhlot extraction. 5

b) How does ion exchange work? 5

c) Discuss the principle of simple, fraction and vacuum distillation. How these three are differ from each other? 10

7. a) What is waste minimization? How can we reduce waste disposal? 10

b) Which software is used for stock room management? Explain in detail. 10

8. a) What are the important laboratory and stockroom safety rules? 5

b) Discuss the safe ways to dispose radioactive materials. 5

c) How can you handle electrical safety? 5

d) What are the different types of fire extinguisher used in chemical laboratory and discuss the role of each. 5

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.