SARDAR PATEL UNIVERSITY

M. Sc. Analytical Chemistry, 4th Semester Examination (CBCS)
Paper: PS04CANC23, **Subject:** Analysis of Industrial Products,
Date: Saturday, 23rd March 2019, **Time:** 2:00 p.m. to 5:00 p.m.

N.B.: i) Figure to the right indicate marks.
ii) Assume the suitable data if necessary and indicate clearly.   **[Total Marks: 70]**

Q. 1.   Answer highlighting the appropriate option :   **[8]**

i.   End-group analysis of polymer provides _____ molecular weight.
     (a) number average   (b) weight average
     (c) viscosity average   (d) None

ii. The saponification value is an index of _____ of the fatty acid of glycerides
     comprising a fat.
     (a) absolute molecular weight   (b) mean molecular weight
     (c) number of unsaturation   (d) None

iii. Which method is a more accurate measure of the degree of unsaturation?
     (a) RM value method   (b) PV value method
     (c) Bromine value method   (d) Saponification value

iv. Which of the following is/are an example of antibiotic?
     (a) Erythromycin   (b) Penicillin
     (c) Tolmetin   (d) a & b Only

v.   In thermogram of TGA, the interval between T_i & T_f is known as _____.
     (a) reaction interval   (b) retention time
     (c) retardation interval   (d) None

vi. _____is responsible for establishing the laws pertaining to crops and agriculture
     processes.
     (a) Environmental Protection Agency   (b) Food and Drug Administration
     (c) U.S. Department of Agriculture   (d) None

vii. What is MRL in agrochemicals analysis?
     (a) Maximum Relaxation Limits   (b) Maximum Residual Limits
     (c) Minimum Residual Limits   (d) Minimum Relaxation Limits

viii. What are principal maxima of APC tablet lying at?
     (a) A=250nm, P=275nm, C=277nm   (b) A=260nm, C= 255nm, P=280nm
     (c) A=275nm, P=277nm, C=250nm   (d) A=277nm, P=250nm, C=275nm

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(P.T.O)

Q. 2. Attempt any _Seven_ : [14]

(i). Define the drug.

(ii). Which parameter is measured in VPO? Why?

(iii). Explain the limitations of end-group analysis.

(iv). Polymer is macromolecular but macromolecular is not polymer, Explain.

(v). How to prepare serum sample?

(vi). Explain the importance of pharmaceutical analysis.

(vii). Give the principle of analysis of phenacetin.

(viii). What do you mean by MRL?

(ix). Which of the following are considered surfactant-type adjuvants? Justify.
1. Spreaders, 2. Buffers, 3. Wetting agents, 4. Colorant dyes
   - A. 1 and 2 only
   - B. 1 and 3 only
   - C. 2 and 3 only
   - D. 3 and 4 only

Q. 3. Answer the following :

[A]. Give the working principle, diagram and advantage of GPC. [6]

[B]. Discuss the analytical techniques used in forensic analysis. [6]

OR

[B]. Describe VPO and How it overcomes the limitations of Cryoscopy and Ebulliometry. [6]

Q. 4. Answer the following :

[A]. Attempt any _Two_ : [6]

(1). Define the pesticide, insecticide, herbicide and analysis of technical grade pesticide and formulation.

(2). A commercial sample of insecticide contains Cu was treated with HNO_3 and evaporated to dryness. After dissolution of residue the Cu was precipitated with α-benzoinoxime, if the weight of sample taken 15.443gm and weight of precipitate having the formula $Cu(C_{14}H_{12}NO_2)$ is 0.6314gm then calculate % of Cu in insecticide. (at. wt. of Cu = 63)

(3). What is residual pesticides analysis? Discuss factor affecting pesticides stability.

[B]. Give various names and its structure of pesticides. Calculate % of phosphate in pesticides sample, if the phosphate in 3.5gm pesticide powder was precipitated by adding 1gm $AgNO_3$. The solution was filtered to remove precipitate of $AgPO_4$. The filtrate required 18.23ml. 0.138M KCNS for back titrations. (at. wt. of P = 31, Ag = 108) [6]

OR

[B]. Describe the chromatographic techniques, its specifications and detectors used for the analysis of pesticides. [6]

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Q. 5. Answer the following : [6]

[A]. **Attempt any *Two* :**

(1). Explain introductory note of pharmaceutical analysis and technique used for drug and pharmaceutical analysis.

(2). Elaborate "Blood composition".

(3). What is normal range of calcium in human blood?
A 0.2420gm sample of calcium tablet dissolved in acid solution and the Ca precipitated as CaC_2O_4. After filtration the precipitate was washed and dissolved in H_2SO_4. pH was Adjusted to 10. 25.0ml of 0.040M EDTA was added and the excess EDTA titrated with 33.28ml of 0.01202M Mg^{+2} solution. Calculate the % of Ca in the sample. (Ca=40)

[B]. Discuss the principle of analysis of (i) Glucose analysis, (ii) Cholesterol [6] analysis (iii) Creatinine analysis.

OR

[B]. Discuss the analysis of ACP tablet. Aspirin drug sample solution is analyzed [6] by transferring 5ml of solution to 1cm cell. The %T measured is 75.3% a 1ml portion of 0.01M pure aspirin is added to the cell and the %T changes to 62.5%. Calculate the concentration of aspirin in the given solution.

Q. 6. Answer the following : [6]

[A]. Give the introductory note on adulteration in edible oils. ·
Discuss the principle of detection of adulteration in cottonseed oil, groundnut oil, rice-bran oil and mustard oil.

[B]. Explain the significance of oil and fat analysis. Discuss detection of Palmolein [6] in groundnut oil and animal fat in vegetable oil.

OR

[B]. **Attempt the following :** [6]

(1). If 1ml aliquot of fish oil is analyzed for nitrogen using Kjeldahl's method after digestion with H_2SO_4 and then distilled ammonia was absorbed in 100ml 0.0503M HCl, the excess HCl required 28.3ml of 0.124M NaOH. Calculate the amount of nitrogen in the sample and milligram of nitrogen per ml of fish oil.

(2). Give the definition, principle and analytical importance of (i). Acid value. (ii). Iodine value. (iii). Ester value.

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