[A-32]

No. of Printed Pages:03

SARDAR PATEL UNIVERSITY

M.Sc.Semester-IV: Analytical Chemistry **Examination** (CBCS)

April-2015, Thursday, Date: 23.04.2015

Time: 10.30 a.m. to 1.30 p.m., **Paper:** PS04CANC03

Subject: Analysis of Industrial Products

Total Marks: 70

N.B.: i) The numbers of the marks carried by each question is indicated at the end of the question

ii) Assume suitable data if considered necessary and indicate the same clearly.

Q.1 Highlight the correct option [08]

i) Which of the following is not an example of antibiotic?
- **a)** Tolmetin **b)** Erythromycin
- **c)** Azithromycin **d)** Penicillin

ii) Which of the following techniques deals with morphology of polymers?
- **a)** ICP **b)** AFM
- **c)** SEM **d)** TEM

iii) The saponification value is an index of_____of the fatty acid of glycerides comprising a fat.
- **a)** mean molecular weight **b)** molecular weight
- **c)** number average molecular weight **d)** mass average molecular weight

iv) What is MRL in agrochemicals analysis?
- **a)** Maximum Relaxation Limits **b)** Maximum Residual Limits
- **c)** Minimum Residual Limits **d)** Minimum Relaxation Limits

v) Which one of the following responsible for the characteristics smell and flavor of mustard oil?
- **a)** Sodium thiocynate **b)** Allyl-isothiocynate
- **c)** Ammonium isothiocynate **d)** None of these

vi) FPD is mainly use for _____ containing pesticide analysis.
- **a)** halogen **b)** P and S
- **c)** Zn **d)** N

vii) Which one of the following is correct for forensic sciences?
- **a)** science used for the purposes of the law **b)** multidisciplinary subject
- **c)** Both b) & a) **d)** science of macro and micro

viii) What are the factors affected pesticide stability?
- **a)** CO **b)** Winds
- **c)** Both a) & b) **d)** Moisture

Q.2 **a)** Attempt any **SEVEN** [14]

i) Explain the operating parameter of SEM

ii) Give the significance of viscosity average molecular weight.

iii) Explain briefly the importance of residual pesticide analysis.

iv) Give brief note on non ionic and cationic surfactant with example.

v) Explain the classification of blood.

vi) Distinguish the term 'drug' and 'pharmaceuticals'.

vii) Explain the importance of pharmaceutical analysis.

viii) Explain the definition of peroxide value.

ix) Define insecticides and herbicides.

Q.3 **a)** Discuss the limitation of cryoscopy and ebullioscopy over VPO. Elucidate VPO with schematic. [06]

b) Answer the following [06]

i) Give the account of microscopic techniques involve in polymer analysis. Discuss its advantage and limitation.

ii) Give the instrumental diagram of GPC and explain its working.

OR

b) Answer the following

i) Explain the techniques mainly use in forensic analysis.

ii) Discuss the applications of TGA and DSC for polymer analysis.

Q.4 **a)** Explain the 'technical grade pesticides' and discus its formulation, responsible factor and requirements. [06]

b) Discuss the quality norms and test parameters for pesticide analysis [06]

OR

b) Discuss analysis of residual pesticide. A commercial sample of insecticide contain Cu was treated with HNO_3 and evaporate to dryness. After dissolution of residue the Cu was precipitate with α-benzoinoxime if the weight of sample taken 15.443 gm. and weight of precipitate having the formula $Cu(C_{14}H_{12}NO_2)_2$ is 0.6314 gm then calculate % of Cu in insecticide. (At. Wt Cu =63).

Q.5 **a)** Unknown antipyretic drug solution label with density and concentration 1.25 gm/mL. and 8.27 M respectively. Calculate the molecular weight of drug compound. What is approximated chemical formula and principle of analysis? Give the brief note on 'pharmaceuticals analysis by spectroscopy'. [06]

b) Answer the following [06]

i) Explain the introductory note of sulfa drug and its analysis.

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

OR

b) Explain the challenges and application of GC-MS and LC-MS instruments; discuss various interfaces use in these systems for pharmaceutical analysis.

Q.6 **a)** Give the definition, principle and analytical importance of followings (i) R.M. value (ii) P.V. value (iii) Ester value (iv) saponification value (v) acetyl value [06]

b) Answer the following [06]

i) Discuss the principle of determination of allyl isothiocyanate and hydrocynic acid in mustard oil and edible oils respectively.

ii) $NaNO_2$ is often added to meat to retard oxidation reaction which causes red meat to gray. Suppose that you are directed to planned a spectrometric method for determining NO_2^- in meat based on its colour forming reaction with N-1-napthaline ethylenediamine and sulphanilic acid at $\epsilon = 2 \times 10^4$. If your sample is to be dilute to 250 mL and absorbance is measured in 1 cm cell. What weight do you recommend so that a sample of average concentration of about 1300 ppm. of NO_2^- will have an absorbance of about 0.4.

OR

b) Give the brief note on adulteration of oils and fat. A 500 mg of sample of buffer was warm with continuous starring with water and dissolve materials was remove by filtration and the clear solution was made acidic by HNO_3 this acidified solution was treated with 10 mL. 0.1755 M $AgNO_3$. The surplus $AgNO_3$ were back titrated with 14.22 mL. 0.106 M KSCN. Calculate the % NaCl in butter sample. (At. Wt.Na = 23, Cl = 35.5)

---------- XXX ----------