M. SC. (ANALYTICAL CHEMISTRY) SEM-III (CHOICE BASED CREDIT & GRADE SYSTEM) : WINTER - 2017

SUBJECT: RECENT ANALYTICAL TECHNIQUES

Day: **Wednesday** Time: **03.00 PM TO 06.00 PM**

Date: **08/11/2017** **W-2017-0776** Max Marks. 60

N.B.

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SEPARATE** answer book.
4) Neat diagram must be draw **WHEREVER** necessary.
5) Grape problem are supplied with the answer sheet.

SECTION - I

Q.1 Attempt any **THREE** of the following : **(15)**

a) Explain applications of monochromatores of all available types.
b) Describe with suitable diagram, atomic absorption spectroscopy with ETA.
c) Explain Tandem man spectrometry with its sketch.
d) Explain any two detectors used in radiation capture process.
e) Draw a neat and labeled diagram for AFS instrument and discuss it in detail.

Q.2 **A)** Attempt any **TWO** of the following : **(10)**

i) Explain interaction of EMR with matter in detail.
ii) Define Beer's law and explain deviation for Beer's laws.
iii) Discuss all sources used in AAS and explain applications in industries.

B) Solve **ANY ONE** of the following **(05)**

i) Calculate the concentration of analyte by using the following data:
$T = 0.3\%$ $\epsilon = 2.61 \times 10^4$ L cm^{-1} mol^{-1}
$B = 1.5$ cm

ii) Calculate the K.E. of a singly charged ion (z=1) if it is accelerated through a potential 10^4V in an electron impact source.

SECTION - II

Q.3 Attempt any **THREE** of the following : **(15)**

a) Describe in brief flow injection analysis & their applications in industries.
b) What are lipids? Make a comment on nutritional significance of it.
c) State Beer's law and derive an expression for the absorption of material.
d) Give definition of detergent and its classification. Explain general scheme of analysis of detergent.
e) What is hemolysis? Justify: hemolysis samples should not be used in serum protein analysis and serum urea analysis.

Q.4 **A)** Attempt any **TWO** of the following : **(10)**

i) Explain the use of automatic titration in pathology laboratory.
ii) Describe tests for sulphonated and non sulphonated material in detergents.
iii) Describe C,H,N,O analyzer in brief with suitable diagram.

B) Solve **ANY ONE** of the following **(05)**

i) A time of light mass spectrometer has a length of 100.00 cm and uses an accelerating potential of 2400V. Calculate the time required for ionic fragments with m/Z 90 k 91 to strike the detector.
Given: Avo.No – 6.022×10^{23}, Charge = 1.6×10^{-19} C.

ii) A solution of vitamin B_{12} shows 75% transmittance at wave length 270nm. Calculate the absorbance of the solution.

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