CHEMISTRY P-III S.Y.B.Sc SEM-III MARKS 100 TIME 3HRS

VCD- 19/10/19

NOTE: i) All the questions are compulsory.
ii) Figures to right indicate full marks.
iii) Use of non –programmable calculator / log table is allowed.

Q.1.A. Fill in the blanks with suitable option and rewrite the statement (any **TWELVE**) (12)

1) Semimicro- analysis refers to sample size of _____mg.
   (a) 100mg
   (b) 10mg-100mg
   (c) 1mg-10mg
2) Accuracy stands for_____.
   (a) Precision
   (b) Neutralization
   (c) Reproducibility
3) Acid base titrations are based on _____ reactions.
   a) Precipitation
   b) Neutralization
   c) Complexation
4) _____ is a classical method.
   (a) Polarography
   (b) Nephelometry
   (c) Gravimetry
5) _____ is a separation technique.
   (a) Solvent extraction
   (b) Polarography
   (c) IR spectroscopy
6) In gas liquid chromatography, mobile phase is _____.
   (a) Solid
   (b) Liquid
   (c) Gas
7) Difference between end point and equivalence point is called as_____.
   (a) Absolute error
   (b) Relative error
   (c) Titration error
8) Solution in flask is called_____.
   a) Titrant
   b) Titrand
   c) None of these
9) Succinic acid is used as _____ standard.
   (a) Primary
   (b) Secondary
   (c) tertiary
10) In the titration of weak acid against strong base at equivalence point.
   (a) pH=1/2(pKw+pKa+log C)
   (b) pH=1/2 (pKw-pKa-logC)
   (c) pH=pKw/pKa

11) In titration of strong acid v/s weak acid,pH at equivalence point is_____.
(a) pH=1/2(pKw+pKa+log C)
(b) pH=1/2 (pKw-pKa-logC)
(c) pH=pKw/pKa

12) In titration of strong acid against weak base, pHat equivalence point is _____.
(a) Greater than 7
(b) Less than 7
(c) Equal to 7

13) Spectrophotometers use _____ as a monochromator.
(a) Filters
(b) Gratings
(c) Both filters and gratings

14) Visible spectrometry use radiation in _____region of electromagnetic spectrum.
(a) 400-750nm
(b) 180-400nm
(c) 750-950nm

15) The photomultiplier tube is basically _____.
(a) A photoemissive cell
(b) A photovoltaic cell
(c) Neither a photoemessive nor a photovoltaic cell

16) Absorbance of the solution is _____.(where ,T=transmittance,I_0 &I_t are the intensity of incident and radiation respectively)
(a) –log T
(b) Log I_t / I_0
(c) Both a and b

17) According Beer-Lambert's law the plot of absorbance versus concentration is a _____.
(a) Straight line passing though origin with a positive slope
(b) Straight line passing through origin with a negative slope
(c) Straight line with positive slope and intercept on Y axis

18) Introduction of an auxochrome I a molecule shifts the absorption to _____.
(a) Shorter wavelength
(b) Longer wavelength
(c) Higher wavelength

B. State whether following statement is true or false. (3)

i) Classical methods are more accurate and sensitive in comparison to instrumental methods.

ii) Phenolphthalein can be used for all acid –base titrations.

iii) s to s* transition is possible with UV radiations.

C. Match the following (5)

I	II
1. Relative error	(a) shift to longer wavelengh
2. Classical	(b) remove soluble impurities
3. Diverse ion effect	(c) solubility of precipitation increases
4. Washing	(d) Xi -Xt
5. Conjugated compounds	(e) volumetry

Q.2 Answer the following: (any four) (20)

a. Discuss sampling of liquids in brief.
b. Define: i) gross sampling ii) sampling unit iii) increment iv) sub sample v) analysis sample
c. What is sub-sample? Discuss coning and quartering method to reduce the sample size of solid sample.
d. Explain any two types of sampling equipment employed in solid.
e. With the help of a suitable diagram explain tools used for sampling of gases.
f. Explain sampling. What is the purpose of sampling?

Q.3.Answer the following: (any four) (20)

a. What is co-precipitation and post precipitation?
b. Explain : how the following factors affect the solubility i)common ion effect ii) pH
c. Distinguish between primary standard and secondary standard.
d. Explain the theory of acid base theory.
e. What are acid base indicators? Explain the use of different indicators for different acid base titration.
f. Explain the conductometric titrations for i) strong acid vs strong base

1. ii) weak acid vs strong base

Q.4. Answer the following: (any four) (20)

a. Derive mathematical expression of Beer lamberts law.
b. With the help of suitable diagram explain working of single beam colorimeter?
c. Discuss the principle of photometric titrations.
d. With the help of suitable diagram explain working of double beam spectrophotometer?
e. Explain the calibration curve method of quantitative analysis. How is the concentration of unknown solution calculated without plotting the graph?
f. Describe the working of i) prism monochromator ii) diffraction grating monochromator.

Q.5.Answer the following: (any four) (20)

a. calculate the mean and the median for the following sets of values:
   i) 6.10,6.12,6.14,6.10,6.12 and 6.14
   ii) 18.30,18.28,18.32,18.27 and 18.
b. Discuss the methods of minimizing the errors.
c. . What are the properties of colloidal precipitate which tend to stabilze it as a colloid.
d. Write a note on drying and ignition of the precipitate.
e. Explain the working of "photovoltaic cell".
f. State limitation and advantages of photometric titrations

****