



UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program :Seventh Semester – 2020

Roll No. in Fig.

Roll No. in Words.

Paper: Analytical Chemistry (Sp. Theory-II)

Course Code: CHEM-413

Part – I (Compulsory)

Time: 15Min. Marks: 10

Attempt this Paper on this Question Sheet only.

Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Signature of Supdt.:

Q.1. Encircle the right answer cutting and overwriting is not allowed. (10x1=10)

- I. Windows of UV spectrophotometer are made of
(a) Silicates glass (b) Alumina (c) Aluminum (d) Quartz
- II. The vibrational energy level is inversely proportional to
(a) Restoring force (b) Reduced mass (c) $(\mu/k)^{1/2}$ (d) None
- III. Incandescent lamp is effective for
(a) UV region (b) Visible region (c) Near IR (d) All
- IV. The bolometers are constructed from
(a) Pt (b) Nickel (c) semiconductor (d) All
- V. The 500A° Wavelength is equal to
(a) 0.05 mm (b) 5 nm (c) 0.005 cm (d) 5×10^{-8} m
- VI. Which of the following compound is used for doubling the frequency of 1064 nm laser
(a) KHPO_4 (b) K_2SO_4 (c) NaCl (d) KCl
- VII. The units of E in $A=\epsilon bc$, where b is path length and c is concentration in liter
(a) Liter/moles.cm (b) cubic meter/moles.meter
(c) Cubic decimeter/mole. meter (d) All
- VIII. Prompt emission of X-rays by an atom ionized by a high energy X-rays caused
(a) Luminescence (b) Fluorescence
(c) Phosphorescence (d) Spontaneous emission
- IX. Absorption is related to transmittance by
(a) Logarithm of transmittance (b) Reciprocal of transmittance
(c) Logarithm of Reciprocal of transmittance (d) multiple of transmittance
- X. Which of the following probe are used for introduction of the solid sample
(a) Silica (b) Quartz (c) Graphite (d) Silver



ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q.2. Give short answers of the following: (10x2=20)

1. Compare internal conversion with external conversions?
2. Describe the basis for radiation detection with silicon diode transducer.
3. Compare echellete grating with dispersive prisms.
4. Define absorptivity and its units.
5. Explains population inversion and light amplification.
6. Contrast between fabry perot etalon and fabry perot interferometers.
7. How holographic grating are produced and their advantages over master gratings.
8. Write about the components of Monochromators.
9. Compare cornu prism with Littrow prism.
10. Compare lifetime of phosphorescence and fluorescence?

Answers the following questions. (3x10=30)

- Q.3. (a) Explain various components of Czerny turner monochromators. (5)
(b) Discuss the working and advantageous of charge injection devices. (5)
- Q.4 (a) Describe multichannel spectrometer used in ICP. AES. (5)
(b) Write not on molecular electronic energy level. (5)
- Q.5. (a) Describe the working of pyroelectric detectors and compare them with bolometer. (5)
(b) Describe in detail Fourier transformer spectrometers instruments. (5)