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[43] SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY
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M. Sc. (INSTRUMENTATION & CONTORL) EXAMINATION

PS02CINC21: ANALYTICAL INSTRUMENTATION
MONDAY, 18th March, 2019, Time: 10:00 A.M. – 1:00 P.M.

Total Marks: 70

Note: Figures to the right indicate maximum marks.

Q1. ***Multiple Choice Questions-***

(A) Tungsten lamp emits majority of its light in ..... region. [1]
(a) Ultraviolet (b) Far Infrared (c) Visible (d) X-ray

(B) According to Beer's law A = a * b * c, where, "a" stands for [1]
(a) aperture constant (b) adaptability coefficient (c) absorptivity coefficient (d) all

(C) Sputtering is the process observed in [1]
(a) LED (b) UV lamp (c) LASER (d) Hollow cathode lamp

(D) The emission of photon from triplet state causes the ..... [1]
(a) Fluorescence (b) Phosphorescence (c) Chemiluminescence (d) none

(E) The radioactive high energy photons which have low penetration & high ionizing power: [1]
(a) α rays (b) βrays (c) γ rays (d) λ rays

(F) In Mass spectrometry the amount of deflection depends on..... [1]
(a) Spin / charge (b) mass / charge (c) mass / spin (d) charge / mass

(G) Biochemical Oxygen Demand (BOD) is method to detect pollution in [1]
(a) Water (b) Air (c) Solid (d) Plasma

(H) Identify the Electrophoresis technique which gives better resolving power. [1]
(a) Cellulose acetate (b) Paper (c) Gel (d) Cool platen

Q2. ***Short answer type questions — attempt any 7***

(1) What are the important properties of Radiation sources? [2]

(2) Enlist the characteristics of Flame Photometry and write its application. [2]

(3) What are practical requirements of Pneumatic Nebulizer? [2]

(4) Sketch the process of Fluorescence and Phosphorescence generation. [2]

(5) What do you mean by Raman Scattering? [2]

(6) Differentiate between NMR and ESR. [2]

(7) Show ESCA and AES process with diagram. [2]

(8) What are different phases of Chromatography? On what basis chromatography is named? [2]

(9) Enlist different parameters to determine pollution of water. [2]

Q3. (a) Explain Fourier Transform Infrared (FTIR) spectroscopy and list its advantages. [6]

(b) Discuss radiation sources for UV-VIS-IR range. [6]

OR

(b) Explain working principle of Golay's pneumatic cell and Pyroelectric detector. [6]

Q4. (a) Write the basic principle of Atomic Absorption Spectroscopy and explain its components. [6]

(b) Describe Photo acoustic spectroscopy with neat diagram. [6]

OR

(b) Explain Instrumentation for Fluorescence measurement. [6]

Q5. (a) Write a note on Nuclear Magnetic Resonance spectrometer. [6]

(b) Explain Magnetic Deflection Mass spectrometer. [6]

OR

(b) Draw block diagram of Radioactive radiation detection and explain Scintillation counter. [6]

Q6. (a) Draw block diagram of Gas Chromatography. Explain each component in brief. [6]

(b) Describe Thermo gravimetric analysis and list its applications. [6]

OR

(b) Write a note on Electrophoresis technique. [6]