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SARDAR PATEL UNIVERSITY

M.Sc. Home Science I Semester (New CBCS) Regular and ATKT

External Theory Examination

Date: 30/11/2012, Friday

10.30 a.m to 1.30 p.m

PH01CFDN01/ PH01CFBT01- Principles and Applications of Instruments and Techniques

Total Marks: 70

(08)

Q.1 Choose the correct answer/answers from the given options

- (i) The complementary Hue for the wavelength range 440-470 nm is
- (A) Blue
 - (B) Orange
 - (C) Red
 - (D) Yellow
- (ii) In UV-visible spectrophotometer, monochromator is placed between
- (A) Sample holder and detector
 - (B) Sample holder and read out device
 - (C) Radiation source and sample holder
 - (D) Detector and read out device
- (iii) Mid-IR spectroscopy measures a sample's ability to absorb light in the
- (A) 2.5-15 μM
 - (B) 250-1500 nm
 - (C) 2.5-15 cm
 - (D) 2.5-15 m
- (iv) In PAGE, ammonium persulfate acts as a
- (A) Crosslinking reagent
 - (B) Catalyst
 - (C) Tracking dye
 - (D) Source of free radical
- (v) The chromatographic technique of enzyme purification based on ionic properties of enzymes
- (A) Ion-exchange chromatography
 - (B) Affinity chromatography
 - (C) Partition chromatography
 - (D) Adsorption chromatography
- (vi) The sensitivity limits for FID is
- (A) 100-1000 μg
 - (B) 10-100 μg
 - (C) 400 μg
 - (D) 10-100 ng

(P.T.O)

(-2-)

(vii) The length of packed column is

- (A) 10-100 cm
- (B) 10-1000 cm
- (C) 0.5-5 m
- (D) 0.5-5 cm

(viii) Haematoxylin stains cell nuclei

- (A) Red
- (B) Blue
- (C) Violet
- (D) Blue

Q.II Answer in brief (any seven)

(14)

- a) Define the laws of spectroscopy.
- b) Activated TLC plate gives better separation in TLC.
- c) FID is known as the destructive detector.
- d) Write the wavelength range for Near, Mid and Far infrared spectroscopy.
- e) Buffer pH is important in protein separation while using electrophoresis.
- f) Pump should be made from good quality of steel in HPLC.
- g) Constant flame is very important in atomic absorption spectroscopy.
- h) Gamma-rays are useful for human life.
- i) Measurement of viscosity is an important parameter for preparation of malt food.

Q.III Answer the following

(A) Define spectroscopy and write in detail about each component used in a fluorometer.

(8)

OR

(B) Write in detail about radiation source and atomizers used in atomic absorption spectroscopy.

(C) The absorption of a solution containing anthocyanin is 0.240 at 540 nm in a 1 cm path length cuvette. Find out....

- (i) the molar absorptivity of anthocyanin at 0.5 mM concentration of anthocyanin.
- (ii) the concentration of anthocyanin to have absorbance of 0.20.

(4)

Q.IV Write the principle and application of the following (any four)

(12)

- a) Mid-Infrared spectroscopy
- b) Ion-exchange chromatography
- c) Electron microscope
- d) Flame photometer
- e) TLC
- f) ELISA

(-3-)

Q.V (A) Write the advantages of HPLC over other chromatography and explain in detail about the pump. (6)

OR

Write in detail about gas supply and injector of GC.

(B) Write in detail method of protein separation using PAGE. (6)

OR

Write in detail about nucleic acid separation using electrophoresis.

Q.VII Write short note on (any four) (12)

- a) TLC
- b) Electro-thermal furnace
- c) Acids
- d) Viscometer
- e) Radiation source of AAS
- f) Tissue sectioning
