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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  $\mu\text{M}$
  - (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 pg
  - (B) 10-100 pg
  - (C) 400 pg
  - (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

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