**V. P. & R. P. T. P. SCIENCE COLLEGE**
**VALLABH VIDYANAGAR – 388 120**
**Internal Examination -2019**
**US06CINV04: SPECTROSCOPY AND BIOMEDICAL INSTRUMENTATION**

**Saturday, 9th March, 2019, 10:00 am to 12:00 pm**

**Total Marks: 50**

Q-1. ***Multiple Choice Questions-*** [8]

(1) In electromagnetic spectrum UV region is .....
(a) 0.3 μ to 0.8 μ (b) 0.8 μ to 200 μ (c) less than 0.3 μ (d) none

(2) High transmittance at desired wavelength and low transmittance at other wavelengths is requirement for
(a) detector (b) source (c) optical filter (d) none

(3) The most commonly used window material in IR range is
(a) NaCl (b) $CO_2$ (c) BaF (d) SiGe

(4) Earth oxides are used in
(a) Globar Rod (b) Nernst Filament (c) Nichrome Strip (d) none of them

(5) EEG is common example of ..... signals.
(a) bioacoustic (b) biochemical (c) bio-optical (d) bioelectric

(6) The measurement of Glavanic skin resistance is example of ..... signal
(a) biochemical (b) bioimpedance (c) bio-optical (d) bioelectric

(7) If the thermocouple is made up of Copper-Constantan, it is of ..... type.
(a) J (b) K (c) T (d) S

(8) ..... medium is immune to cross talk.
(a) copper cable (b) waveguides (c) strip line (d) optical fiber



Q-2. ***Answer any five*** [10]

(a) What type of Instrument related errors occur in Spectrometer?

(b) State Beer Lambert law.

(c) List the materials used for prism construction.

(d) What is Littrow mounting infrared monochromator?

(e) Draw neat labeled diagram of man machine interface.

(f) What is the use of needle electrodes?

(g) Define systolic and diastolic pressure.

(h) Write laws to accurately measure temperature by thermoelectric means.

PTO

| | | |
|---|---|---|
| Q-3. | Draw block diagram of Absorption Instrument and explain each block briefly. | [8] |
| | **OR** | |
| Q-3. | Explain High vacuum photo-emissive cells and photomultiplier tube. | [8] |
| Q-4. | Describe Optical Null type double beam Infrared spectrophotometer. | [8] |
| | **OR** | |
| Q-4. | Write a note on Radiation sources in IR range. | [8] |
| Q-5. | Discuss the basic principle of Bio-potential generation with sequential figures and PQRS complex graph. | [8] |
| | **OR** | |
| Q-5. | Write a note on Blood Pressure measurement. | [8] |
| Q-6. | Explain principle of Coulter counter. | [8] |
| | **OR** | |
| Q-6. | Discuss in brief types of Optical Fiber Sensors. | [8] |



**********