

U.G. 6th Semester Examination-2022**ENVIRONMENTAL SCIENCE****[HONOURS]****Discipline Specific Elective (DSE)****Course Code : ENVS-H-DSE-L-03B****(Instrumental Techniques for Environmental Analysis)**

Full Marks : 40

Time : $2\frac{1}{2}$ Hours*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any **five** of the following: $2 \times 5 = 10$
 - a) Differentiate between spectrophotometry and spectrofluorimetry.
 - b) What do you mean by noise pollution level (L_{NP})?
 - c) How is sulphate in water/ soil sample estimated?
 - d) Write some characteristics of radionuclides that make them hazardous to humans.
 - e) What is the application of flame photometry?
 - f) Distinguish between primary air pollutants and secondary air pollutants.
 - g) What do you mean by flameless (cold vapour) atomic absorption?

[Turn over]

- h) Why BOD is less than COD? Justify your answer.

2. Write short notes on any **two** of the following:

 $5 \times 2 = 10$

- a) Gas chromatography
- b) Detection of radiation by Geiger-Muller counter
- c) Biomonitoring of air pollution
- d) Noise levels and measurement

3. Answer any **two** of the following: $10 \times 2 = 20$

- a) State the application of radio carbon dating. What are the techniques of industrial noise control at the receiver? Calculate the noise intensity level of a noise of intensity 10^{-3} W/m^2 . $4 + 3 + 3 = 10$
- b) How charcoal can be used as an efficient absorbent for gases and vapours in air? Explain the principle and use of High-volume sampler for the collection of atmospheric particulate matter. Name and draw the structures of the indicators used in the estimation of hardness. $3 + 4 + 3 = 10$
- c) Write the sample preservation techniques for the following water quality parameters—chromium, arsenic, phosphate and nitrogen

(ammonia, nitrate, nitrite). Describe the method for estimation of nitrate and nitrite in water sample. 5+5=10

- d) Explain the working principle of Inductive-Coupled Plasma Mass Spectrometry (ICPMS). Describe the basic components of Atomic Absorption Spectrophotometry (AAS) with a neat sketch. 5+5=10
