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**MEVE-018**

**M. SC. (ENVIRONMENTAL SCIENCE)  
(MSCENV)**

**Term-End Examination**

**December, 2022**

**MEVE-018 : INSTRUMENTATION TECHNIQUES  
FOR ENVIRONMENTAL MONITORING**

*Time : 3 Hours*

*Maximum Marks : 100*

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***Note :** Answer any **ten** questions. Each question carries 10 marks.*

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1. What are the different components of HPLC ?  
Explain its applications.
2. Write short notes on the following :
  - (a) Surface and shallow surface grab sampling
  - (b) Water sampling
3. Explain the following with suitable examples :
  - (a) Cytophotometry
  - (b) Flow cytometry

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4. Describe the following :
  - (a) Principle of gas chromatography
  - (b) Any *two* applications of TLC
5. What are the *four* steps of Gram staining ? Explain.
6. What is the principle of 2-D gel electrophoresis ? Explain.
7. Explain the working mechanism of enzyme immunoassays.
8. What are the applications of biochemical and microbiology techniques in clinical and forensic investigations ?
9. Explain the following :
  - (a) Electrochemical biosensors
  - (b) Optical biosensors
10. What are microarrays ? What are their applications ?
11. Describe various detectors used in Gas Liquid Chromatography.

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12. Explain various chromatography techniques based on principle of separation.
13. What are the different applications of advanced chromatography techniques ?
14. Describe various methods used in air sampling.