



MAV-003-001328 Seat No. _____

B. Sc. Forensic Science (Sem. III) (CBCS) Examination

October / November – 2016

**FS-301 : Basic Concepts & Principles of Physical,
Chemical & Biological Analysis Technique - I**

Faculty Code : 003

Subject Code : 001328

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) This question paper contains three questions.
All are compulsory.
(2) Draw neat and labelled diagrams wherever necessary.
(3) Figures to the right indicate marks.

1 Give the answer of following questions : **20**

- (1) IR spectroscopy based on change in rotation and vibration of molecule. Is it true?
- (2) NMR spectroscopy based on which principle?
- (3) Which electron transition occur in $\text{CH}_3\text{-CH}_3$?
- (4) $n \rightarrow \sigma^*$ transition required more energy than $\pi \rightarrow \pi^*$ transition. True or False?
- (5) Which material used in the composition of the rod of Nernst glower lamp in IR spectrometer ?
- (6) Which part is replaced by an interferometer in FTIR?
- (7) Give the types of molecular vibration.
- (8) In Raman spectroscopy, Rayleigh scattering is more intense than either of the two other types. True or False ?
- (9) Give the Beer's Law.
- (10) Which is known as the brain of computer ?

- (11) Example of the input device of computer.
- (12) In domain name www.yahoo.com, the underline word refers to _____.
- (13) How we can prevent unauthorized access and use of computer?
- (14) Define electrophoresis.
- (15) Agarose gel is made up to a basic repeating units of_____.
- (16) Give the name of classical methods of separation.
- (17) Define parotope.
- (18) Define hypersensitivity.
- (19) Give the full name of SDS-PAGE.
- (20) Define cracker.

2 Give answer of following questions : **25**

(a) Write any **three** out of six : **6**

- (1) Define spectrum and spectroscopy.
- (2) Block diagram of Raman Spectrometer.
- (3) Properties of electromagnetic radiation.
- (4) Define computer crime and give the example of it.
- (5) What is virus? Mention the three main types of virus.
- (6) Draw the block diagram of Gel electrophoresis.

(b) Write any **three** out of six : **9**

- (1) Write a note on degree of freedom.
- (2) Source of radiation in IR spectroscopy.
- (3) Instrumentation of Raman spectrophotometer.
- (4) What is integrated circuit ? Mention only steps of fabrication process of IC.
- (5) What is biometrics ? Give the example of biometrics.
- (6) Write a note on SDS-PAGE.

- (c) Write any **two** out of five : **10**
- (1) Write a note on Sampling device and sample preparation procedures of sample in different physical state in IR spectroscopy.
 - (2) Write a note on types of spectra and types of molecular energy.
 - (3) Fabrication process of Integrated circuit.
 - (4) Write a note on Gel electrophoresis.
 - (5) Explain structure of immunoglobulin.
- 3** Give answer of following questions : **25**
- (a) Write any **three** out of six : **6**
- (1) Define the electrophoresis and electrophoretic mobility.
 - (2) Define Rf value, which is relates to chromatography and mention the characteristics of Rf value.
 - (3) Give the difference between 2-D and 3-D chromatography.
 - (4) Give the types of paper chromatography.
 - (5) Give the characteristic of Ig M.
 - (6) Define epitop and paratop.
- (b) Write any **three** out of six : **9**
- (1) Describe the production of antibodies.
 - (2) General function of immunoglobulin.
 - (3) Detection method used in paper chromatography and its forensic application.
 - (4) Forensic application of TLC.
 - (5) Write the principle of GC and about the types of GC.
 - (6) Explain the structure of DNA.

(c) Write any **two** out of five : **10**

- (1) Explain antigen-antibody reaction.
 - (2) Describe the instrumentation of GC with labelled diagram HPLC.
 - (3) Write a note on components of thin layer chromatography.
 - (4) Explain DNA replication.
 - (5) Write a note on computer viruses.
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