



HCX-003-1013024

Seat No. _____

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

October / November – 2017

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

Faculty Code : 003

Subject Code : 1013024

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

[Total Marks : 70

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

- 1 (a) Objective type questions : 4
- (1) Give the wavelength range of IR region.
 - (2) In which substance $\pi \rightarrow \pi^*$ transition occur ?
 - (3) Which material used in the composition of prism and sample holder in the IR spectroscopy?
 - (4) In Raman spectroscopy, Raman bands arise from a change in the Polarizability. True or False ?
- (b) Answer in brief : (any 1 out of 2) 2
- (1) Block diagram of FTIR.
 - (2) What is Raman shift?
- (c) Answer in detail : (any 1 out of 2) 3
- (1) Describe monochromator.
 - (2) Instrumentation of Raman spectro photo meter.
- (d) Write a note on : (any 1 out of 2) 5
- (1) Write a note on theory of Raman spectroscopy.
 - (2) Instrumentation of IR spectroscopy.

- 2** (a) Objective type questions : **4**
- (1) Who is the pioneer of modern genetics?
 - (2) What is nucleotide?
 - (3) Define histone.
 - (4) Which enzymes are necessary for the DNA replication?
- (b) Answer in brief : (any 1 out of 2) **2**
- (1) What is the difference between monohybrid and dihybrid process?
 - (2) Function of chromosome.
- (c) Answer in detail : (any 1 out of 2) **3**
- (1) Explain the Mendel law of heredity.
 - (2) Write the function of chromosome.
- (d) Write a note on : (any 1 out of 2) **5**
- (1) Write a note on RNA translation.
 - (2) Describe the structure of eukaryotic chromosome.
- 3** (a) Objective type questions : **4**
- (1) Define immune system.
 - (2) Give the characteristics of acquired immunity.
 - (3) Define parotope.
 - (4) Define hypersensitivity.
- (b) Answer in brief : (any 1 out of 2) **2**
- (1) Give the characteristic of IgG.
 - (2) Define antigen and give its example.
- (c) Answer in detail : (any 1 out of 2) **3**
- (1) Describe the cell of immune system.
 - (2) Describe the production of antibodies.

- (d) Write a note on : (any 1 out of 2) 5
- (1) Explain antigen-antibody reaction.
 - (2) Explain types of immunity.
- 4 (a) Objective type questions : 4
- (1) Give the name of classical methods of separation.
 - (2) Give the example of 3-D chromatography.
 - (3) Full name of TCD.
 - (4) Define electrophoretic mobility.
- (b) Answer in brief : (any 1 out of 2) 2
- (1) Explain: Preparative chromatography.
 - (2) Difference between capillary and packed column.
- (c) Answer in detail : (any 1 out of 2) 3
- (1) Detection method used in paper chromatography and its forensic application.
 - (2) Factors affecting the electrophoresis.
- (d) Write a note on : (any 1 out of 2) 5
- (1) Write a note on Components of thin layer chromatography.
 - (2) Classification of chromatography methods.
- 5 (a) Objective type questions : 4
- (1) Morphological parts of hair.
 - (2) Define fiber.
 - (3) Give the types of diatoms.
 - (4) Difference between secretor and non-secretor?
- (b) Answer in brief : (any 1 out of 2) 2
- (1) Function of hair.
 - (2) Types of diatoms

- (c) Answer in detail : (any 1 out of 2) **3**
- (1) Classification of synthetic fiber.
 - (2) Define Urine, Composition of Urine and give its general characteristics.
- (d) Write a note on : (any 1 out of 2) **5**
- (1) Morphology of diatoms
 - (2) Starch iodine and radial diffusion test for saliva.
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