DK-M-2011120   Seat No. _____

M. Pharm. (Sem. II) (CBCS) Examination

April / May – 2015

Proteins & Protein Formulations

Time : **3** Hours]   [Total Marks : **80**

Instructions : (1) Answer and tie up both the sections separately.

(2) Figure to the right indicates marks.

(3) Answer any three (03) questions from each section.

(4) Question one (1) and questions five (5) are compulsory.

(5) Draw neat and clean diagrams as required.

SECTION – I

1 Write a short note : (Any Seven)   **14**

(1) Enlist different methods of protein engineering.

(2) Described briefly site directed mutagenesis.

(3) What is direct evolution?

(4) Enlist different methods of protein quantification.

(5) Enlist different methods of protein purification.

(6) What is gene shuffling?

(7) What is the effect of pH on protein formulations?

(8) How temperature effects stability of protein formulation?

2 Discuss in detail principle, methods and application of   **13**
2D gel-electrophoresis and image analysis.

3 (1) Discuss chemical and physical methods for protein   **7**
engineering.

(2) Briefly discuss about protein engineering and write   **6**
its application in various fields.

4 (1) Write a note on site directed mutagenesis.   **7**

(2) Isolation and purification of an engineered protein.   **6**

SECTION – II

5 Answer Any TWO (2) Question from the following :   **14**

   (1) Write a note on force degradation study in protein formulations.

   (2) Discuss in detail PEGylation and its importance in protein formulation.

   (3) Described in detail protein nano-particles.

6 Discuss in detailmass spectroscopy and its importance in   **13**
   biological formulations.

7 Write a note on Edman degradation and Chymotryptic   **13**
   Peptide Mapping.

8 Write a short note :   **13**

   (1) Liposomes

   (2) Bioanalytical methods used in protein formulation

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