BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI – DUBAI CAMPUS
DUBAI INTERNATIONAL ACADEMIC CITY
SECOND SEMESTER 2013 – 2014
BIOT F416 INTRODUCTION TO PHARMACEUTICAL BIOTECHNOLOGY
COMPREHENSIVE EXAMINATION (CLOSED BOOK)

Duration: 3h. **Date: 29.5.2014**
Weightage: 40% **Max. Marks: 40**

Note: a) answer all the questions, b) answer to the point and c) draw schematic diagrams if required.

1. What are the current status and future prospects of biopharmaceuticals? Explain with suitable examples. [3.0]

2. How the studies on protein structure help in the development of a biopharmaceutical? Explain the role of higher structure determination methods in drug development process with any one example. [3.0]

3. What is a patent and what is patentable? Explain with suitable examples. [3.0]

4. Explain the mechanism of transcytosis for the drug transport with suitable diagram.[3.0]

5. What are the factors which affect the pharmacokinetic and pharmacodynamic characteristics of therapeutic proteins? Explain. [3.0]

6. Briefly explain on IL-2 receptor and its role in activation of T-cell for the synthesis of cytokines with a suitable diagram. [4.0]

7. What are the factors which affect IL-2 activity in the cells which limits its use as a biopharmaceutical? Briefly outline. [3.0]

8. Explain on tumor necrosis factor, binding, functions and its therapeutic effects. Mention limitations of its applications. [4.0]

9. write a short note on the following on properties, functions, and applications. [1x5=5]
   a. Granulocyte colony stimulating factor
   b. Macrophage colony stimulating factor
   c. Erythropoietin
   d. Insulin like growth factor
   e. Platelet derived growth factor

10. Explain on insulin and production technologies for pharmaceutical applications with suitable diagram. Give any two commercial insulin product. [3.0]

11. Write a short note on glucagon as a biopharmaceuticals. Mention why recombinant is need? [3.0]

12. Why human growth hormane is needed? Explain the production methods and functions of hGH. [3.0]

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BIOT F416 INTRODUCTION TO PHARMACEUTICAL BIOTECHNOLOGY
TEST-II (OPEN BOOK)

Duration: 50 min. **Date: 20.4.2014**
Weightage: 20% **Max. Marks: 20**

Note: a) answer all the questions, b) answer to the point and c) draw schematic diagrams if required.

1. How the IL-2 receptor plays role in the recognition of interleukins? Explain the immunosuppression and immunostimulation affect IL-2 functions. Draw schematic diagrams. [4.0]

2. a. What are the scope for TNF as a biopharmaceutical? [1+2+2=5]
   b. How the receptor for TNF functions may have altered in cancer?
   c. Briefly explain any one use of TNF as a biopharmaceutical in clinical applications.

3. How the growth factors are used in osteoclasts? Explain with suitable diagram. [4.0]

4. How the glycosylation is important in growth factors? For biological applications how the glycosylation is introduced? Give at least any two methods for the growth factor glycosylation. [4.0]

5. What mode of application is most preferred for the erythropoietin, PDGF and IGF? Mention the mechanism of uptake of the above growth factors. [3.0]

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BIOT F416 INTRODUCTION TO PHARMACEUTICAL BIOTECHNOLOGY
TEST-I (CLOSED BOOK)

Duration: 50 min. **Date: 2.3.2014**
Weightage: 25% **Max. Marks: 25**

Note: a) answer all the questions, b) answer to the point and c) draw schematic diagrams if required.

1. Briefly outline any four aspects on how the recombinant DNA technology impact upon the production of pharmaceutically important proteins. [4.0]

2. Give any four recombinant (r) biopharmaceuticals approved for medial and or veterinary applications. [3.0]

3. Why the carboxylation and hydroxylation is important protein biopharmaceuticals? Mention the functions and significance with respect to aminoacid due to carboxylation and hydroxylation to the proteins. [3.0]

4. How the sulfation and amidation of proteins is required and mention any two proteins which require such protein modifications? [3.0]

5. How the protein engineering is used in the development of biopharmaceuticals? Give any three examples of approved biopharmaceuticals that have been altered by post-translational engineering. [3.0]

6. How the discovery of biopharmaceuticals are being carried out? Briefly outline any two method with examples. [3.0]

7. What is pharmacogenetics? How this specialization is helpful in biopharmaceuticals? [3.0]
8. Briefly explain IPR and patentable biopharmaceuticals with examples. [3.0]

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QUIZ-I (CLOSED BOOK)

Duration: 20 min. **Date: 23.3.2014**
Weightage: 8% **Max. Marks: 8**

Note: a) answer all the questions, b) answer to the point and c) draw schematic diagrams if required.

1. What is first-pass metabolism? Briefly outline with respect to administering biopharmaceutical by oral mode of drug delivery. [1.0]

2. What is trans-endocytosis? Briefly outline with a schematic diagram. [1.5]

3. What are the advantages of nasal delivery of biopharmaceuticals? List any four. [1.0]

4. What are preclinical studies? List any four examples. [1.5]

5. List any three factors which affect pharmacokinetic and pharmacodynamic characteristics of therapeutic proteins? [1.5]

6. List three mode of action of a biopharmaceutical. Briefly outline. [1.5]