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III SEMESTER

**B.Tech. BT**

SUPPLEMENTARY EXAMINATION

February 2019

**BT207 Engineering Analysis and Design (New scheme)**

Time: 3 Hours

Max. Marks: 40

**Note:** Answer ALL questions. All questions carry equal marks.  
Assume suitable missing data, if any.

- Q.1 [A] Attempt any TWO of the following [2+2]
- Describe the application of gasification, pyrolysis and geosequestration in biofuel production from lignocellulosic biomass
  - Describe any two antagonistic approaches of biocontrol. What carriers are used in biocontrol formulation?
  - Give a flowsheet representation of vaccine manufacturing with brief details of each step
- [B] Answer the following [2+2]
- Describe various treated vessels for adherent culture of animal cells. What is meant by feeder layer?
  - Describe the functions of various genes localized on T-DNA of pTi plasmid. *vir* genes can act in *trans*. How is this fact exploited in pTi based vector construction?
- Q.2 [A] Attempt any TWO of the following [2+2]
- Enumerate various accessories present in a fermentor along with their functions
  - Compare and contrast cassette mutagenesis and doped cassette mutagenesis
  - Write in brief about inoculation, growth and production media for fermentative production of a microbial metabolite
  - Give schematic representation of the general scheme of cycle for protein designing by directed evolution method

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- [B] Answer the following [2+2]
- Write in brief about the principle and procedure of affinity chromatography. How is this technique applied for the eukaryotic mRNA purification?
  - Briefly describe rotor, particle (spherical) and medium parameters affecting centrifugation
- Q.3 [A] Attempt any TWO of the following [2+2]
- Describe the principle and working of biosensor
  - Enumerate various properties of biomaterials
  - What are biomaterials? Describe their medical applications
- [B] Explain in detail any two applications of biosensor in health sector [4]
- Q.4 [A] Attempt any TWO of the following [2+2]
- Describe the principle of SDS-PAGE
  - Write the principle and working of mass spectrometer
  - Compare and contrast adsorption and partition chromatography
- [B] Answer the following [2+2]
- Describe the principle and procedure of sandwich ELISA
  - Compare and contrast indirect ELISA and direct ELISA
- Q.5 [A] Attempt any TWO of the following [2+2]
- Give an account of the following: (a) Cradle-to-grave variant of life cycle assessment; (b) Damage oriented method of life cycle impact assessment
  - What are carrier ampholytes and ampholines? How are these used for the generation of pH gradient gel for isoelectric focussing?
  - Describe the terms - life cycle inventory and life cycle impact assessment
- [B] Answer the following [2+2]
- Define isoelectric point (pI). Also describe the correlation between pI of protein and pH of the medium
  - Give a process diagram indicating life cycle assessment

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