

OBT 3.1

(L:V:P = 4:0:0)

100 Marks

### Paper-3.4: Microbial Technology and Entrepreneurship

1. Microorganisms in the service of man – past, present and future. **2 hrs**
2. Traditional microbial technologies – curdling of milk, bread and wine making, other traditional fermented foods of India and the world **4 hrs**
3. Microorganisms of industrial importance – overview of isolation, screening and maintenance, microbial industries and commercially important products, status and demand and production – Indian and global scenario **6 hrs**
4. Raw materials for microbial processes – availability and utilization, significance of locally available raw materials **4 hrs**
5. Production of pharmaceutically and commercially important products – alcohol and alcoholic beverages, antibiotics, enzymes, vitamins., monoclonal antibodies **8 hrs**
6. Production of fermented milk products – yogurt, cheese **2 hrs**
7. Microbes in agriculture – composting, nitrogen fixation, vermicomposting, overview of biofertilizers and biopesticides – production and applications **6 hrs**
8. Microbial fuels – alternate sources of energy - methane and hydrogen production, their significance, prospects of commercial production of microbial fuels; microorganisms in the recovery of precious metals, biodegradable polymers from microorganisms **8 hrs**
9. Single cell proteins & single cell oil – mushroom cultivation, oil from microorganisms **2 hrs**
10. Genetically engineered microorganisms – applications in health, industries, agriculture, environment, fate of genetically engineered microorganisms in the environment **4 hr**
11. Microbial Entrepreneurship – Government schemes for commercialization of microbial (biotech) technology, Government regulations, Entrepreneurship-Developing a Business Plan, Basic Concept of Financial, Management, Major Financial statements- An Overview, Human Resource Management, Legal and Statutory requirements, Marketing , Negotiation Skills, rural and women entrepreneurship **8 hrs**
12. Patenting and Intellectual property rights **2 hrs**

#### Books:

1. Martin Gross, 2003, Entrepreneurships in Biotechnology,
2. De Hayne & J Kapelers, 2006, Innovation and Entrepreneurships in Biotechnology
3. Richard Dana Ono, 1991, Business of Biotechnology, Butterworths
4. Crueger & Crueger Biotechnology: A Text Book of Industrial microbiology 2nd edition
5. Casida, Industrial Microbiology
6. Demain, A.L Biology of Industrial Microorganisms
7. Frazier WC & Westhof DC; Food Microbiology, 3<sup>rd</sup> Ed., Tata McGraw Hill.
8. Doyle PM et al; Food Microbiology – Fundamentals & Frontiers, 2<sup>nd</sup> Ed., ASM Press.
9. Ananthakrishnan CP. Et al. (1994); Dairy Microbiology, Sreelakshmi Publ. Chennai.
10. Rabinson RK. (1990); Dairy Microbiology, Elsevier Applied Science, London.

OBT 3.1:

50 Marks

(L:V:P = 0:0:2)