

SOLAPUR UNIVERSITY, SOLAPUR

Semester Pattern Syllabus

B.Sc.III (SEM V &VI)

Entrepreneurship

(w.e.f. June 2015)

Sem V

Course Code	Title of the Course	Theory /Practical	Marks	Lecture / Practical Period
Ent-301	Entrepreneurship Paper IX (Business Finance)	Theory	50	45
Ent-302	Entrepreneurship Paper IX (Human Resource Management)	Theory	50	45
Ent-303	Ind. Chemistry Paper IX (Spectroscopic methods)	Theory	50	45
Ent-304	Ind. Microbiology & Ind.Biotechnology Paper- IX (Advances in Fermentation Technology)	Theory	50	45
Ent-305	English	Theory	50	45

B.Sc. IIIrd (Sem.V) Entrepreneurship
Ent-301 Entrepreneurship Paper IX
Business Finance

Unit I: **11**

New Dimensions in Business Finance:

Lease financing, Meaning, Importance, Types of lease financing, Lease V/s Buy decision, Problems and Prospects of leasing in India.

Venture Capital:

Concepts, Process of Investment and exit route, venture capital in India.

E- Banking: Introduction

Unit II: **11**

International financial institutions:

International Monetary Fund (IMF), International Bank for Reconstruction & Development (IBRD/ World Bank), International Finance Corporation (IFC), Multinational Investment Guarantee Agency.

Introduction to Business Finance :

Concept, Nature, Scope, Objective and Importance.

Sources of Business Finance :

Long term equity shares, Preference shares, Debentures, Bonds, Loan from banks, Public deposits, Sources of working capital finance

Unit III **11**

Business finance :

International finance, International finance environment, Global capital structure

Foreign exchange:

Foreign exchange, Foreign exchange market, convertability of rupees & its implications.

Marketing of Securities:

Issue of securities, Public issue, Steps in public issue, Right issue and private placement.

Stock Exchange :

Definition, Functions, Stock exchange in India, BSE and NSE and their working, Trading on stock exchange, Online trading.

Unit IV: **12**

Financial planning:

Concept of financial plan, Objective of financial planning, types & steps in financial planning,

Capital budgeting:

Concept of capital budgeting, methods of ranking project – payback period method, internal rate of return, present value method.

Books for Reference :

1. Essential of Business Finance - Dr.R.. Shrivastav
2. Business Finance - P.V. Kulkarni
3. Corporation Finance - S.C. Kuchal
4. Investment and securities market in India - V.A. Audhani
5. Corporate Finance Policy - Guthmann & Dougall.
6. Stock exchange and investment - Raghunathan.
7. Stock exchange in India - K.C. Gupta

B.Sc. IIIrd (Sem.V) Entrepreneurship
Ent-302 Entrepreneurship Paper IX
Human Resource Management

Unit I: **11**

Nature and Scope of Human Resource Management:-

Meaning, Definitions, Objectives, Functions and Importance of Human Resource Management, Role of Human Resource Management.

Recruitment:-

Definition, Objectives, External & Internal sources of recruitment, Job Analysis, Job description, Job Specification,

Unit II: **11**

Selection process:-

Introduction of selection, Meaning of selection, Concept of selection, Essential of Selection procedure, Steps in selection procedure, recent trends in selection, Job satisfaction

Training & Development:-

Meaning of training, importance of training, Need & Objectives of training, Training Principles, Advantage of training, Training Method, Meaning of development, principles of development.

Unit III: **11**

Internal & External mobility:

Internal mobility: need & purpose. Promotion: meaning, types, purpose, bases, benefits. Transfer: Meaning, types, reasons, benefits, problems. Demotions: reasons & principles. External Mobility: meaning & types

Career Planning & Developments

Meaning succession planning. Elements of career development programme, Steps in career development system, advantage & limitations

Unit IV: **12**

Employee Benefits:-

Provident Fund, Gratuity, E.S.I. Maintenance Allowance, Convenience Allowance, Employee Health and Safety, Accident prevention.

Performance appraisal:-

Meaning, purpose, Need of performance appraisal, methods of P. A., Use of P. A., Problems of P.A., Who will appraise?

Books for Reference :

1. Personnel & HRM - P.Subha Rao
2. Managing Human Resources - Arun Monappa
3. Human Resource and Personnel Management - K. Ashwathappa
4. Management of Human Resource - R.S. Dwivedi
5. Human Resource Management - Biswajeet Patanayale
6. Human Resource Management - Ian Beardwen & Len Holden

B.Sc. IIIrd (Sem.V) Entrepreneurship
Ent-303 - Industrial Chemistry
Paper IX (Spectroscopic methods)

Unit I: **10**

Ultra - violet absorption:

Spectroscopy : Introduction, Beer - Lambert Law, Types of electronic transitions, Terms used in U V spectroscopy : Chromospheres, Auxochrome, Batho chromic, Hypsochromic, Hyperchromic and Hypochromic shifts, Effect of conjugation on position of UV bands, Calculation of λ_{max} by Woodward - Fieser rules of conjugated dienes and enones. Applications of UV spectroscopy : Determination of structure and stereochemistry (cis and trans).

Unit II: **12**

Infrared Spectroscopy :

Introduction, Principle of IR spectroscopy, Fundamental modes of vibration, Types of vibration Hooke's law, conditions for absorption of radiation and selection rule, Fundamental group regions of IR spectrum, Functional group region, Finger print region, Characteristic absorption of various functional groups Applications of IR spectroscopy : Determination of structure, Identification of functional groups simple spectral problems based on I.R.

Unit III: **15**

Introduction to NMR Spectroscopy:

Introduction, proton magnetic resonance H spectroscopy principles of PMR spectroscopy, magnetic and non-magnetic nuclei, Theory of PMR - spectroscopy - spinning nuclei magnetic moment and magnetic field, precessional motion of nuclei without mathematic model nuclear resonance.

NMR instrument - schematic diagram shielding and deshielding, chemical shift, measurement of chemical shift by delta scale and tau scale, TMS as reference, Advantages of TMS, peak area (Integration) spin-spin splitting (n+1 rule) definition of coupling constant J value of first order coupling. PMR spectra of ethanol, acetaldehyde, 1,1,2 - tribromoethane, ethyl compounds using PMR spectroscopic data (supporting IR & UV data to be given)

Unit IV: Mass spectroscopy. **08**

1.3.1 Introduction

1.3.2 Theory of mass spectroscopy, Mass spectrometer - schematic diagram, formation of ions by ionisation, types of ions with at least one example.

1.3.3. Applications of mass spectroscopy.

- i) Determination of molecular weight.
- ii) Determination of molecular formula

Reference Books:

1. Spectroscopy of Organic Compounds - P.S. Kalsi.
2. Elementary Organic Absorption Spectroscopy - Y.R. Sharma
3. Spectroscopy - V.M. Parikh.

B.Sc. IIIrd (Sem.V) Entrepreneurship
Ent-304 - Ind. Microbiology & Ind. Biotechnology
Paper IX
Advances in Fermentation Technology

Unit I **11**

Quality Assurance and Validation

Good manufacturing practices and safety- Quality management, personal, premises and equipment, documentation, production, quality control, contract manufacturing and analysis, complaints and product recall, self inspection.

Introduction to GLP and its principles.

IPR and Patents

-Intellectual Property Rights (IPR), Patents, Trademarks, Copyrights, Secrets, Patenting of biological materials.

Unit-II **11**

Bioethics and Biosafety

Biosafety guidelines

- Risk and risk assessment
- Biosafety levels, laboratory biosecurity concepts
- Pre-clinical and clinical trials
- Basics of bioethics principles, international codes and guidelines in India
- Ethics in post-genomic era.

Unit III

Recombinant fermentation products **11**

Production of bacterial vaccines: DNA vaccines, Preparation of toxoid from a toxin,

Recombinant proteins – Insulin, Interferon.

Mushroom cultivation, Vinegar production

Unit-IV **12**

Fermentation products & bioprocesses

Bio products and other Processes: Natural Biopreservatives

(Bacteriocin / Nisin), and Biopolymers (Pullulan / Xanthan Gum and, PHB). Production of Solvents- Acetone butanol, glycerol

Books for Reference :

1. Casida L. E. (1991). Industrial Microbiology, New Age international Ltd.
2. Crueger W. and Crueger A. (2000). Biotechnology: A textbook of Industrial Microbiology. 2nd edition. Panima Publishing Co. New Delhi.
3. Patel A. H. (1996). Industrial Microbiology. 1st edition, Macmillan India Limited.
4. Stanbury P. F, Whitaker A. and Hall S. J. (2006). Principles of Fermentation Technology. 2nd edition, Elsevier Science Ltd.
5. Pepler H.J., Perlman D. (2004). Microbial technology-Fermentation Technology, second edition, Volume I and II, Academic Press.

SOLAPUR UNIVERSITY, SOLAPUR

Semester Pattern Syllabus

B.Sc. III

Entrepreneurship

(w.e.f. June 2015)

Sem VI

Course Code	Title of the Course	Theory /Practical	Marks	Lecture /Practical Period
Ent-301	Entrepreneurship Paper X (International Business)	Theory	50	45
Ent-302	Entrepreneurship Paper X (Organizational Behavior)	Theory	50	45
Ent-303	Ind. Chemistry Paper X (Techniques in Industrial Chemistry)	Theory	50	45
Ent-304	Ind. Microbiology & Ind. Biotechnology Paper X (Genetic Engineering & Techniques in Plant Tissue Culture)	Theory	50	45
Ent-305	English	Theory	50	45

B.Sc. III (Entrepreneurship Sciences) Practical Course

Practical	Title of the practical	Marks
EntPr-301	Practicals in Entrepreneurship	50
Ent Pr-302	Practicals in Entrepreneurship (Project)	50
Ent- Pr-303	Practicals in Industrial Chemistry	50
Ent Pr-304	Practicals in Industrial Microbiology and Industrial Biotechnology	50

B.Sc. IIIrd (Sem.VI) Entrepreneurship
Ent-302 Entrepreneurship Paper X
International Business

Unit I: 11

International Business:–

Definition, Evaluation, Nature of International Business, International Business approaches.

Theories of International Business: - Absolute cost advantage, comparative cost advantage, and comparative cost advantage with money.

Problems of International Business.

Foreign Trade Procedures-Export procedure, Import procedure, Financing technique, Export promotion.

Balance of payment – Introduction, Components of balance of payment, Disequilibrium in Balance of payment

Unit II: 11

International Economic Environment:-

International Trade Policy and Relations, Tariffs, Subsidies, Import Quota, Voluntary Export restraints. Administrative policies and International law and Business firms.

Globalisation

Emerging global economy. Drivers of Globalisation, Globalisation Debates: Advantages & Disadvantages of Globalisation, Globalisation in India

Multinational Corporation

Defination, concept, factors that contributed for the Growth of MNCs, Advantages & Disadvantages of MNCs

Unit III: 11

Modes of entering in International Business :

Modes of entry, Exporting, Licensing, Franchising, Contracts, Turnkey Projects, Mergers, Acquisitions and Joint Venture.

World Trade Organization and Trade Blocks Economic Integrations, Free Trade Area, Custom unions common markets, Economic Unions, GATT, EEC, ASEAN, SAARC, SAFTA

Concept of e-commerce: Models: B-B, B-C, C-C

Foreign Direct Investement (FDI): Meaning, factors influencing, FDI in India.

Unit IV: 12

Getting started on Basic SAP R/3 Elements:

The client or SAP customer, the clients representative, the SAP consultant, the SAP R/3 business application software architecture, financial accounting and controlling (FI/CO) modules, the sales and distribution (SD) module, the materials management (MM) modules, the plant maintenance (PM) and service management, the production planning (PP) module, the project system (PS) module, the human resources (HR) module, the SAP retail model, industry solutions (IS) modules, the ASAP roadmap.

Books for Reference :

1. Frame works International II edition - Rajer Benneet, Financial Times Management - Pitmen Publishing Landon
2. International Business : Test & Cases
By P.Subba Rao - Himalaya Publishing House
3. Global Marketing : S.A. Sherlekar & V.S. Sherlekar.
4. E-business - Kittel Amer
5. E-commerce - David Whitely

**B.Sc. IIIrd (Sem.VI) Entrepreneurship
Ent-302 Entrepreneurship Paper X
Organizational Behavior**

Unit I: **11**

Introduction to Organization Behavior:

Definition, Historical, Evolution of O.B., Nature & Scope, Learning Organization, Types of Learning Organization.

Individual & Organization Behavior:

Individual Differences & their uses in industries, Individual process, thinking memory, leaving, emotion, intelligence and ability.

Group Dynamics: Nature of groups, Type of group, Why do people join group, Group development, usefulness of group in organization, Determinants of group behaviour, Group Structure, Individual and Inter Personal behavior, job satisfaction, time management & good setting.

Unit II: **11**

Power & Political Behaviour

Power Dynamics, Sources of power, the effective use of power, Power tactics, Politics- Essence of politics, Types of political activity, Ethics of power & politics

Personality:

Nature of Personality, Types of personality, Theories of personality-trait theory, social learning theory, Maslos theory, personality & O. B.

Perceptions:

Perceptions- Meaning & Definations, Factors influencing perceptions, perceptual process, perception & O.B.

Unit III: **11**

Motivation:

Nature of motivation, Importance of motivation, Theories of Motivation- Maslows theory, Hereberg theory, Expectancy theory, Global setting theory

Work Stress:

What is stress, the stress experience, work stress model-Strerssors, sources of stress, individual level of stressors, group level stressors

Unit IV: **12**

Electronic commerce environment and opportunities:

Background, the electronic commerce environment, electronic market Place technologies, conclusion.

Modes of Electronic commerce:

Overview, Electronic data interchange, Migration of open EDI, Electronic commerce with WWW / internet, Commerce Net Advocacy, Web commerce going forward.

Electronic cash and Electronic payment:

Internet monetary payment and security requirements, payment and purchase order process, online electronic cash.

Books for Reference:

1. Organizational Behavior - Meshane, (Tata Mcgraw Hill)
2. Organizational Behavior - Luthan
3. Human Behavior at Work - Keith Devis
4. Organizational Behavior - Robins (Prentice Hall)
5. Organizational Behavior - Baron & Greenberg (Prentice Hall)
6. Organizational Behavior - Suja Nair (Himalaya Publisher)
7. Organizational Behavior - K. Ashwathappa (Himalaya Publisher)

B.Sc. IIIrd (Sem.VI) Entrepreneurship
Ent-303 - Industrial Chemistry
Paper X (Techniques in Industrial Chemistry)

Unit I: **15**

Chromatography:

Introduction, General Principal, Classification, Paper Chromatography, Column chromatography, Thin Layer Chromatography, Gas Chromatography, High pressure liquid chromatography.

Unit II: **10**

Electroplating:

Electrolysis, Faraday's law, cathode current efficiency, basic principles of electroplating cleaning of articles, electroplating of nickel and chromium, Anodizing.

Unit III: **10**

Green Chemistry:

Introduction, twelve principles of green chemistry zeolites - Friedel craft's alkylation and acylation, oxidation of benzene to phenol and benzoquinone, Reduction of benzoquinone to hydroquinone, Biocatalytic reactions, hydroxylation and oxidation using enzymes microwave assisted reactions.

Unit IV: **10**

Fire Hazards

Types of fires - class A, class B, class C & class D, Fire extinguishers
Classification water and water base extinguishers.

- i) Portable fire extinguishers
- ii) Soda acid extinguishers
- iii) Antifreeze extinguishers
- iv) Foam
- v) Dry Chemicals, CO₂, and Halon – 1301

Books for Reference:

1. Basic Concepts of Analytical Chemistry - S.M.Khopkar, Wiley Eastern Ltd. Mumbai
2. Advanced Organic Chemistry - B.S. Bahl and Arun Bahl, S.Chand Comp. Delhi.
3. A Text book of Engineering Chemistry - Shashi Chawala.
4. A Text book of Engineering Chemistry - Jain & Jain.
5. Industrial Chemistry - B.K. Sharma
6. Engineering Chemistry - Paradkar
7. Physical Chemistry - G.M. Barrow, International Student Edition, Mc.Graw Hill.
8. University General Chemistry - C.N.R Rao. Macmillan.
9. Physical Chemistry - R.A. Albery, Wiley Eastern Ltd.
10. Principles of Physical Chemistry - S.H. Maron, C.H. Prutton 4th Edition.
11. Instrumental of Molecular Spectroscopy - C.. Banwell - Tata McGraw Hill
12. Text Book of Physical Chemistry - S.Glasstone, Macmillan India Ltd.
13. Element of Physical Chemistry - D.Lewis and S.Glassure (Macmillan)
14. .Essential of Physical Chemistry - Bahl and Tuli (S.Chand)

B.Sc. IIIrd (Sem.VI) Entrepreneurship
Ent-304 - Ind. Microbiology & Ind. Biotechnology
Paper X (Genetic Engineering & Techniques in plant tissue culture)

Unit I :	11
Genetic Engineering: History of Genetic Engineering, Concepts, Ethical issues.	
Vehicles: Cosmids, Plasmids, Bacteriophages phagemids, Shuttle vectore.	
Role of Emymes in Gene Cloning: Nucleases, Polymerases, Ligases, Topoisomerases	
Unit II:	11
Techniques used in r DNA Technology: Agarose, PAGE, Southern, Northern and Western blotting, construction of chimeric DNA, Preparation, Labeling & usage of proper construction and screening of genetics & C DNA libraries.	
Gene Amplification: PCR and its application. Transgenic Plants: Molecular forming, herbicide resistance, insect resistance, virus resistance, flavor savor tomato.	
Unit III:	11
Tissue Culture Techniques : Concept of cell theory, cellular totipotency, milestones in plant tissue culture. Culture Medium: Nutritional requirements of the explants, PGRs and their invitro.	
Callus Culture: Introduction, Principle, Protocol, Factors affecting, Morphology and Internal structures, Genetic variation, Application and limitations.	
Suspension Culture: Introduction, Principle, Protocol, Types, Growth and measurement, Synchronization, Applications and limitations.	
Unit IV:	12
Organ Culture : Introduction, Principle, Protocol, Factors affecting applications & limitations with reference to root tip culture, Leaf Culture, Shoot tip and meristern culture, ovary and ovule culture.	
Anther and Pollen Culture: Introduction, Protocol, Factor affecting, Applications & limitations.	
Micro Propagation : Introduction, Stages of Micro propagation, Factors affecting, Applications & limitations.	

Books for Reference:

1. Hall, R.D. (Ed.) 1999. Plant Tissue Culture: Techniques and Experiments, Academic Press, New York.
2. Bhojwani, S.S. and Razdan, M.K. 1996. Plant Tissue Culture: Theory and Practice (a revised edition). Elsevier Science Publishers, New York, USA. Bhojwani, S.S. 1990. Plant Tissue Culture: Applications and Limitations, Elsevier Science Publisher, New York, US
3. An Introduction to Genetic Engineering, 2nd Edition, **Desmond S.T. Nicholl**, Cambridge University Press (2006).
4. Molecular Biotechnology: Principles and Applications of Recombinant DNA, 3rd Edition, **B.R. Glick and J.J. Pasternak**, ASM Press (2007)
5. Principles of Gene Manipulation and Genomics, 7th Edition, **S.B. Primrose and R.M. Twyman**, Blackwell Publishing (2006)
6. Molecular Biotechnology, 2nd Edition, **S.B. Primrose**, Panima Publishing (2001)
7. Introduction to Biotechnology, Low Price Edition, **W.J. Thieman and M.A. Palladino**, Peaeson Education (2007)
8. Genetic Engineering : Principles And Practice, **Sandhya Mitra**, Macmillan India (1996)
9. Genetic Engineering: Principles and Methods, **Setlow J.K.**, Kluwer Academic Publishers. (2000)
10. Genetic Engineering, **Yount L.**, Gale Group (2002)
11. Molecular Cloning: A Laboratory Manual (Volume - I, II & III) **Sambrook J., D.W. Russell**, Cold Spring Harbor Laboratory Press (2001)

Solapur University
Practical Examination B.Sc. III (Entrepreneurship)

A) Every candidate must produce a certificate from the Head of Department in his/her college stating that he / she has completed in satisfactory manner a practical course on the lines laid down from time to time by the Academic Council on the recommendation of board of studies and that the laboratory journal has been properly maintained. Every candidate must have recorded his / her observation in the laboratory journal and written a report on each exercise performed. Every journal has to be signed periodically by the member of the teaching staff and certified by the Head of the Department at the end of the year. Candidate are to produce their journals at he practical examination and such journals will be taken into account by the examiners in assigning marks.

Students have to work in industries / training business during vacation and prepare selected report & submit at the end of IInd term of B.Sc.III (Entrepreneurship)

B) The practical examination of each course will be of 6 hour duration for each batch of 12 students.

* **For Industrial Microbiology and Biotechnology course practical examination will be conducted on two successive days for B.Sc.III (each batch of 12 students.)**

C) Examination staff for each batch

1. Two External examiners on inspection day & practical examination days.
2. One laboratory supervisor for inspection & practical examination days.
3. One laboratory expert, lab assistant for preparation and inspection day.
4. Two lab attendant, one peon, field collector for two preparation days, practical examination days and one washing day.

Solapur University
B.Sc.III (Entrepreneurship)
EntPr-301 Entrepreneurship
Practical Work
(5 Periods / Week / Batch)

1. To study problems of International Business by visiting a global export unit.
2. To visit an experts unit and study export & imports rules & regulations.
3. To study any two franchising and Turnkey Projects.
4. To study recent Policies of GATT, ASEAN, SAARC, SAFTA.
5. To visit organization doing e-business & collect information.
6. To collect cuttings from news-papers relating to business finance.
7. To study sources of working capital finance.
8. To visit stock exchange and collect information.
9. To study problems and prospects of leasing in India by visiting organization.
10. To study venture capital.
11. To study role of H.R. Manager, Interactions with two H.R. Managers.
12. To study training methods for employees in an organization.
13. To study motivation and disciplinary policy of any organization.
14. To prepare questionnaires for testing job satisfaction and conduct interview of Employees of any two industries.
15. To study Health & Safety provisions for employees in any organization.
16. To study, How to learn Organization.
17. A) To study individual differences and their suitability for jobs in any Organization.
B) To study I.Q. its chart and collect information.
18. To study time management schedule of employees in any organization.
19. To study the stress and suggest remedies to the working people.
20. To study organization culture and its development in any organization.

EntPr-302 Entrepreneurship

Students have to work in industries / training business during vacation and prepare selected report & submit at the end of IInd term of B.Sc.III (Entrepreneurship)..... 50Marks

Solapur University B.Sc.III (Entrepreneurship)

EntPr-303 Entrepreneurship

Industrial Chemistry Lab – Course

1. To estimate the amount of sucrose in the given solution by using Fehling's solution.
2. To estimate the amount of nitro group from the given solution of m-nitro aniline (by snc12 reduction method)
3. To determine the amount of acid & ester in the given mixture of acid & ester.
4. To estimate the amount of acid and amide from the given mixture of acid and amide.
5. Preparation of benzene azo B-naphthol from B-naphthol.
6. Preparation of paint.
7. To estimate Fe^{3+} ions by thiocyanate method using colorimeter.
8. To verify Lambert - Beer's law by using copper sulphate solution colorimetrically.
9. To determine the normality of strong acid by titrating it against given strong alkali by potentiometric method.
10. To determine the dissociation constant of monobasic acid (acetic acid)
11. To determine the normality of the given weak acid by titrating it against the strong alkali conductimetrically.
12. Determination of titrable acidity in the given sample of milk or Lassi using supplied sodium hydroxide (standard oxalic acid solution to be prepared to standardize the given sodium hydroxide solution.)
13. Determination of percentage of magnesium in the given sample of talcum powder using given solution of EDTA.
14. Preparation of ferrous ammonium sulphate.
15. Determination of % purity of a sample containing ferrous ammonium sulphate using given solution of potassium dichromate.
16. Preparation of tetramine copper (II) Sulphate.
17. Determination of % purity of a sample containing tetramine copper (II) Sulphate by using given solution of sodium thiosulphate.

Solapur University B.Sc.III (Entrepreneurship)
EntPr-304 Entrepreneurship
Industrial Microbiology and Biotechnology
Practical courseec

1. Introduction to PTC Laboratory	1 P
2. Aseptic Manipulation - Washing, Copping, Packing & sterilization, Laminar Operation & General Precautions.	1 P
3. Stock solutions & media preparation.	1 P
4. Aseptic seed germination	1 P
5. Callus Culture - initiation	1 P
6. Suspension Culture - initiation	1 P
7. Micropropagation stage - I Initiation of culture / auxiliary bud culture tehique.	1 P
8. Micropropagation stage - II Subculture & multiplication.	1 P
9. Micropropagation stage - III Rooting - invitro & ex-vitro	1 P
10. Micropropagation stage - IV Acclamitazation & hardening.	1 P
11. Calculation of molecular weight of digested DNA.	1 P
12. Cloning of plasmid / plasmid vector	1 P
13. Ligation of DNA	1 P
14. Southern blotting technique	1 P
15. DNA amplification by PCR	1 P
16. Microbial production of dextran by <i>Leuconostoc mesenteroides</i>	2 P
17. Maintenance and Preservation of microorganisms-short term and long term	2 P
18. Culturing and Characterization of microorganisms used in Dairy industry	3 P
19. Culturing and Characterization of yeast used in Bakery/distillery/winery	3 P
20. Demonstration of Acetic acid oxidation (vinegar production) in laboratory.	3 P
21. Cultivation of edible mushroom on laboratory scale.	3 P
22. Validation of instruments & lab material.	3P