

**MASTER OF COSMETIC TECHNOLOGY SEMESTER – I**  
**1MCT-T-3 Core-III RESEARCH METHODOLOGY (R.M.) and I.P.R.**

Maximum Marks : 100  
External            70  
Internal -        30

1. Methods of Sampling :  
Concept of Sampling, Methods of Sampling, probability Sampling, Non-probability Sampling, Choice of the Sampling Method, Characteristics of a good sample.
2. Research Tools I :- Questionnaire rating scale, attitude scale and test, introduction, scales of Data measurement, characteristics of a good research tool.
3. Research Tools – II : Interview, observation and documents : introduction, types of tools and their uses, interview, observation, documents.
4. Data collection : Introduction, concept of data, methods of data collection, asking questions, observation of behaviour, utilisation of existing records of Data, ensuring the quality of Data.
5. Tabulation and organisation of Data : Introduction, types of Data: quantitative and qualitative processing of quantitative Data, Data processing, contingency tables, graphical presentation of quantitative Data, representation of frequency distribution, graphs for nominal and ordinal data, graphs for relation between two variables, qualitative data, organization of qualitative Data.
6. Introduction and need for Intellectual property Rights (I.P.R.) – Types of Intellectual property Rights (I.P.R.) :  
Patent, Copyright, trademark, design, geographical indication, varieties and layout design – Genetic resources and traditional knowledge – Trade Secrets.  
IPR in India : Genesis and Development.

IPR in abroad – Major international instruments concerning Intellectual Property Rights :- Paris Convention, 1883, the Bern Convention 1886, the Universal copyright convention, 1952, the WIPO convention, 1967, the Patent Co-operation Treaty 1970, The TRIPS Agreements, 1994

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**MASTER OF COSMETIC TECHNOLOGY SEMESTER – I**  
**1MCT-T-1 CORE-I FORMULATION AND DEVELOPMENT –I (FD-) DSC I.I**

Maximum Marks : 100  
External            70  
Internal -        30

1. Consideration of physical and chemical problems inherent in the formulation and development of cosmetic preparations.
  - a) Physical Properties :- Physical forms, practical size, solubility, wetting of solids and flow, cohesiveness and organolaptic properties.
  - b) Chemical properties and stability of ingredients and additives.
2. Formulation Additives : Antioxidants and preservatives, perfumes, colouring and diluting agents, emulsifying and suspending agents, basic materials for creams/ointment bases, solvents and miscellaneous additives.
3. Packaging of Cosmetics : Filling of solids, semisolids and liquids. Materials used for cosmetic packaging Rules and Regulations and legal provisions for packaging and labelling.

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**MASTER OF COSMETIC TECHNOLOGY SEMESTER - I**  
**1MCT – T- 2 Core –II Quality Assurance Techniques I (QAT 1) DSC II.I**

Maximum Marks : 100  
External            70  
Internal -        30

1. Quality Assurance management –  
Introduction  
Quality and related terms – Basic concepts  
Quality – Quality functions, Quality control, quality policy, quality objectives, quality assurance, quality management.  
Inspection and Test  
Inspection and Inspection planning, Inspection manual, Product acceptance inspection, Inspector errors.

- Sampling – Sampling plans, procedures
2. Good manufacturing practices (GMP) – Schedule M, MI, MII CGMP, latest amendments in GMP
  3. Analysis of raw materials and Evaluation of finished products giving emphasis on – Physicochemical properties, chemical analysis, identification instrumental analysis, biological toxicological testing  
Products – Emulsions ( Liquid cream ), suspension (lotion), powders ( talcum, baby, compact) lipsticks, mascara, kajal, hair care products ( Shampoo, colorants ) tooth pastes, tooth powders, men’s toiletries, antiperspirants deodorants, nail lacquers, aerosols etc.

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MCT – T- 4

**MASTER OF COSMETIC TECHNOLOGY SEMESTER - I**  
**Advanced Cosmetic Technology – I ( ACT I ) DSC – III.I**

Maximum Marks : 100  
External                    70  
Internal -                    30

1. Interfacial Phenomenon :  
Liquid – Liquid interface : Insoluble monolayer’s, surface pressure, surface potential, surface rheology and their measurements, structure and state of monolayers, mixed monolayers, macromolecular films, Biological membranes, Liquid-solid interface, detailed study of wetting detergency and water repellency.
2. Theories of dispersion Techniques – Physical considerations, adsorption and interfacial energy, study of relevant equation, adsorption at solid surfaces, electrical phenomenon at interfaces, particle-particle interaction.
3. Concept of Solubilisation  
Surface Active agents, Micelle formation, factors affecting micelle formation and physical methods of investigation of micellar solutions. Theory and mechanism of solubilisation.
4. Solubilisation and its applications :- Some factors in the formulation of Cosmetics containing solubilised materials like choice of surface active agents, affect on the nature of the solubility, Idophors, Vitamin preparation, hormones solutions, steroids, flavours and perfumes etc.

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**Subject : Advanced Cosmetic Technology – I**  
**DSC – III.I Lab**  
**Practical Syllabus**

- 1) To determine surface tension of given sample by stalagmometer.
- 2) To determine viscosity by using Ostwald viscometer at room temperature.
- 3) To determine interfacial tension of given sample.
- 4) To find critical micellar concentration (cmc) of given surfactant.
- 5) Determination of partition coefficient of iodine in CCl<sub>4</sub> and water.
- 6) Determination of solubility of given sample at room temperature.
- 7) Determination of PK<sub>a</sub> value by Handerson Hasselba equation.
- 8) Determination of solubility of benzoic acid in different solvents.
- 9) Determination of effect of co-solvents on solubility of benzoic acid in water.
- 10) Determination of effect of PH on solubility.
- 11) Estimation of saturation solubility of given sample in water.

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**MASTER OF COSMETIC TECHNOLOGY SEMESTER - I**  
**DSE-I/MOOC TH MAJOR ELECTIVE- SKIN CARE COSMETICS**

Maximum Marks : 100  
External                    70  
Internal -                    30

- 1) Phytochemical Screening of Natural products : General method used for isolation & purifications of natural products. Study of chromatographic techniques applied to natural products and recent trends in the field.
- 2) Study of application and mechanism of action of following categories of synthetic actives like Cleansing, Emollient & Skin Pigmentation, Antipimples & Anticellulite, Fresheners & Perfumers, Astringents & Antibacterials, Emulgents.
- 3) Study of Natural ingredients action on Skin in the following category :  
Scrubbing : Apricot, Walnut, Pistachio  
Cleansing : Olive oil, Sesame oil, Alve vera

Emollient : Lanolin, Beeswax, Cocoa/Shea butter  
 Skin Pigmentation : Licorice, Jesthamadh, Saffron  
 Antipimples : Black pepper, Daru Haldi, Nutmeg  
 Anticellulite : Caffeine (Tea/Coffee) Vinca, Cinchona, Withani  
 Fresheners, & perfumes : Chandan, Khus, cinnamon  
 Astringents : Tannic acid, Ashoka, Hirda  
 Antibacterial : Curry Leaves, Capsicum, Tea tree oil  
 Emulgents : Accacia, Agar, Tragacanth

4) Standardization of Actives :

Importance of standardization (as per WHO guidelines), assessment of synthetic actives and Herbal extracts in formulations, methods employed for standardization of herbs with special reforms to industrial methods HPLC, HPTLC; Flaxh Chromatography, GLC etc.

**Recommended books**

- 1) Pharmacognosy Vol I & Vol II by Mohammed Ali
- 2) Materia medica
- 3) Herbs useful in dermatological Theraphy, Behl P.N.
- 4) Dian Dinein Buchmans Herbal medicure, Gramercy, publication, company issustrated by Leaven Jarrett.
- 5) Wealth of India
- 6) The Ayurvedic Encyclopedia.
- 7) Herbs, Spices, and Medicinal plants Vol I, II, III & IV by Kyle, E. Craker & James E. Simon.

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**MASTER OF COSMETIC TECHNOLOGY SEMESTER - I  
 DSC-II .I QUALITY ASSURANCE TECHNIQUES – I  
 (QAT I)**

Maximum Marks : 50

Paper - 25

Sessional - 25

- 1) Carry out identification, physicochemical properties, chemical analysis, instrumental analysis, Raw Materials as per official standards :-  
 Waxes, fatty acids/Alcohols/esters, dispersing agents, colors, perfumes, preservatives, antioxidants, sweetening agents, adsorbents etc.  
 Finished Products :-  
 Emulsion, suspensions, powders (Talcum, baby and compacts). Lipsticks, mascara, Kajal, men's toiletries (Shaving cream, after shave lotions, eue-de-cologne), soaps, perfumes, .
- 2) Evaluation (determination and detection) of the following in the finished product -

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**MASTER OF COSMETIC TECHNOLOGY SEMESTER - I  
 DSC-I .I Lab FORMULATION AND DEVELOPMENT I (FD I)**

Credit – 1

Maximum Marks : 50

Paper - 25

Sessional - 25

- 1) Study of Physical and Chemical properties of ingredients used in Cosmetics Development of following Cosmetic products and incorporation of additives line color, perfumes and study of effect of ingredients on the formulation of following products.
  - I. Emulsion – Skin cream/Lotion/Sunscreen/Skin Lightening/Hair removing cream/any other
  - II. Suspension –Kajal/Mascara/Face pack/Foundation/Calamine cream/Lotion, any other
  - III. Oral care – Tooth paste and Tooth powder
  - IV. Colored cosmetics- Nail lacquer, Lipsticks, Eye shadow, any other
  - V. Aerosol/Perfume
  - VI. Men's toiletry- Shaving cream, Aftershave lotions.

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**MASTER OF COSMETIC TECHNOLOGY SEMESTER - I**  
**DSE 1 Lab ELECTIVE –I SKIN CARE COSMETICS (SCC)**

Credit – 1

Maximum Marks : 50

Lecture -1

Paper - 25

Sessional - 25

- 1) Study of Morphological & Microscopic characters of Herbs used in Skincare
- 2) Photochemical constituents identification & quality control & standardization.
- 3) Application of various methods for extraction, solvent systems & isolation of active constituents.
- 4) Study of Various oils used in Aromatheraphy with special reference to its applications.
- 5) Use of latest active synthetic derivatives in skin care products.

**M. Tech. Year – I Semester – I**

Sr. No.	Subject	L	P	C	Max. Mark				Total Marks	Minimum Passing	
					Theory		Practical			Internal	External
					Internal	External	Internal	External			
1	Research Methodology and IPR	4		4	30	70			100	Internal	External
2	DSC- I Formulation and Development - I	4		4	30	70			100	12	28
3	DSC II. 1- Quality Assurance Techniques – I	4		4	30	70			100	12	28
4	DSC – III 1 – Advanced Cosmetic Technology- I	3		3	30	70			100	12	28
5	DSE – I/MOOC- Skin Care Cosmetics	3		3	30	70			100	12	28
6	DSC- I. 1Lab Formulation and Development – I		2	1			25	25	50	25	
7	DSC- II. 1 Lab Quality Assurance Techniques – I		2	1			25	25	50	25	
8	DSC- III. 1 Lab- Advanced Cosmetic Technology- I		2	1			25	25	50	25	
9	DSE- I/MOOC- Skin Care Cosmetics Lab		2	1			25	25	50	25	

**MASTER OF COSMETIC TECHNOLOGY Semester II  
FORMULATION & DEVELOPMENT –II (FD-II)**

**DSC-1.2**

L-4

C-4

Max.Marks-100

Paper-70

Sessional-30

- 1 Formulation and Development of Hair gels, Creams, Serums, Hair Conditioners, Hair packs, Hair oil, Eucalyptus, Anti perspirant.
- 2 Eye care – Eye shadow, Eye liners, Under eye gels, Creams and serums, Under eye concealer and High lighters, and any other.
- 3 Pilot Plant scale up Techniques : General considerations. Review of formula, Raw materials, equipments etc.
- 4 Establishing pilot plant, studies, scale-up the manufacture of product to intermediate and large production.

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**MASTER OF COSMETIC TECHNOLOGY SEMESTER II  
ADVANCED COSMETIC TECHNOLOGY-II (ACT II)**

**DSC-II.2**

Max.Marks-100

Paper-70

Sessional-30

- 1 Emulsions  
Electrical theories of stabilization of emulsions, assessment and prediction of emulsion shelf life, equations, involved in emulsion stability stress conditions and physical parameters employed to evaluate emulsion stability, Production, equipments, Industrial processing and large-scale manufacture.
- 2 Suspensions :  
Theory, Production, equipments, industrial processing and large-scale manufacturing.
- 3 Rheology :  
Theoretical considerations, Thixotropy, spurs and bulges in the hysteresis loop, continuous shear rheometry of semisolids, viscoelasticity, product design, Rheology and cosmaceutical processing, Rheology and biological applications.
- 4 Micromeritics :  
Adsorption, air permeability techniques and determination of surface area and size of particles. Classification and evaluation of some basic properties of powders, flow properties of various powder systems.

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**MASTER OF COSMETIC TECHNOLOGY Semester II  
STATISTIC AND QUALITATIVE TECHNIQUES (SQT)**

**DSC-III.2**

Max.Marks-100

Paper-70

Sessional-30

- 1 Conceptual understanding of statistical measures. Classification and tabulation of data. Measurement of central tendency, measures of variation.
- 2 Frequency distribution, histogram, frequency, polygons, Oliver.
  - a) Binomial distribution
  - b) Parametric and non-parametric tests.
- 3 Testing of hypothesis. Type I and Type II errors. Levels of significance
  - a) Chi-square test. Goodness of fit. Independence of attributes 2x2 and r x c contingency tables.
- 4 Regression and prediction.  
Analysis of variance – one way and two – way classification.

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**DSE-III.2**  
**DSC-III.2**

**ADVANCED HAIR CARE COSMETICS (HCC)**

Max.Marks-100  
Paper-70  
Sessional-30

- 1 Nomenclature, characteristics & classification, chemical constitution, method of isolation & estimation of herbs used for hair care and recent trends in the field.
- 2 Study of Natural Ingredients acting on hair in the following categories-  
Hair Conditioning : Coconut Oil, Olive Oil, Egg White  
Hair growth promoter : Brahmi, Fenugreek, Jatamansi  
Hair Tonics : Calendula, Hibiscus, Arnica  
Antidandruff : Tulsi, Neem, Wheat Gram Oil.  
Hair Colorants : Amala, Heena, Bhringaraja  
Hair cleansing : Ritha, Shikakai, Amla
- 3 Natural products as hair care : Apple, Apricot, Banana  
Wheat, Barli, Melon, Carrot, Cucumber, Spinach, Berries, Beet root, Peach, Sweet Potato, Pudina, Tomato, Milk, Yogurt, Tea, Honey.
- 4 Extraction & isolation of active principles of herbs and synthetic actives, & their incorporation in various cosmetics formulations like creams, lotions, powders & other cosmetics, formulations.
- 5 Application of Nanotechnology in hair care –products.

**Recommended books**

- 1) Indian Materia Medica by Nadkarni T.B. of Pharmacognosy by Trease Evans
- 2) Wealth of India – C.S.P. Publications.
- 3) Hand Book of Herbal Products Vol I & II by NIIR Board of Technologist.
- 4) Pharmacopoeia Standards of Herbs by Dr.C.R. Karnik.
- 5) Cosmetics Analysis Selective Methods with Techniques by P.Bare.
- 6) Pharmacognosy Vol I & II by Mohammed Ali CBS Publications, New Delhi

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**DSC-I.2 Lab**  
P-2  
C-1

**MASTER OF COSMETIC TECHNOLOGY SEMESTER II**  
**FORMULATION AND DEVELOPMENT II [F D II]**

Max.Marks-50  
Paper-25  
Sessional-25

- 1 Extraction & Isolation of active principles from important cosmeceutical /therapeutic herbs.
- 2 Incorporation of active herbal principles in various cosmetic products. (at least two products form each category – solid, semi, and liquid)

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**DSC-II.2 Lab**

**MASTER OF COSMETIC TECHNOLOGY SEMESTER II**  
**ADVANCED COSMETIC TECHNOLOGY-II (ACT II)**

Max.Marks-50  
Paper-25  
Sessional-25

- 1 Evaluation of stability of Emulsions through different methods.
  - a. Accelerated stability study.
  - b. Particle size analysis
  - c. Other Parameters
- 2 Evaluation of stability of suspension through different method
  - d. Accelerated stability study.
  - e. Particle size analysis
  - f. Other Parameters
- 3 To measure Zeta potential of emulsion and to co-relate with stability.
- 4 To determine the cmc of surfactants by stalagmometer .  
(Anionic , Cationic, Nonionic, Ampholytic)

- 5 To determine the cmc of surfactants by capillary rise method.
- 6 To study the effect of salts on cmc of surfactant.
- 7 Determination of amount of surfactants with respect phase-volume ratio
- 8 To demonstrate the effect of air –entrapment on rheology of creams.
- 9 Interaction between the preservatives and antioxidants, emulsifying agents.
- 10 Interaction of above mentioned additives on the different packaging material.

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**DSC-III.2 Lab**

P-2

C-1

**MASTER OF COSMETIC TECHNOLOGY Semester II  
STATISTIC AND QUALITATIVE TECHNIQUES(SQT)**

Max.Marks-50

Sessional-25

External -25

- 1 Study of sampling method
- 2 Collection of data for minimum two cases /study/survey.
- 3 Statistical analysis of data

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DSE.II. Lab /Mooc lab

P-2

C-1

**MASTER OF COSMETIC TECHNOLOGY SEMESTER II  
STATISTIC AND QUALITATIVE TECHNIQUES(SQT)**

Max.Marks-50

Uni.Exam-25

Sessional-25

- 1 Study of Morphological and microscopic characters of various herbs used in hair care.
- 2 Study of Various Phytochemical constituents and their identification(Testing)
- 3 Study of various Extraction methods & isolation of active constituents from various herbs.
- 4 Study of various extraction methods for active constituents from fruits.
- 5 Use of latest active synthetic derivatives in hair care products.

**M. Tech year-I Semester -II**

Sr.No	Subject	L	P	C	Max Marks				Maximum Marks	Minimum Passing Marks	
					Theory		Practical				
					Internal	External	Internal	External			
1	DSC.I.2 Formulation and Development –II	4	-	4	30	70	-	-	100	12	28
2	DSC.II.2 Advanced cosmetics technology –II	4	-	4	30	70	-	-	100	12	28
3	DSC.III.2. Statistic and qualitative techniques	3	-	3	30	70	-	-	100	12	28
4	DSE/MOOC Advanced hair care	3	-	3	30	70	-	-	100	12	28
5	DSC-I.2 Formulation and development-II	-	2	1	-	-	25	25	50	25	25
6	DSC-II.2 Advanced cosmetics technology –II	-	2	1	-	-	25	25	50		
7	DSC.III.2 Statistics and qualitative techniques	-	2	1	-	-	25	25	50		
8	DSEII Lab /MOOC Lab – Advanced hair care	-	2	1	-	-	25	25	50		
9	Industrial training dicing vacation of semi & sem. II	-		4*	-	-	-	-			