

M. Phil Science of Dental Materials (Major Complusary)

PAPER-I

TABLE OF SPECIFICATIONS

The grey areas of the course whose learning cannot be evaluated or are difficult to cover in MCQ's shall be used for framing SEQ's, which may be split into two parts if necessary; attempt shall be made to avoid duplication between MCQ'S and SEQ's. Distribution of MCQ's and SEQ's is with respect to the importance of topics. Table of Specification is also provided with the document.

Note:

MCQ's = 80
SEQ's = 07

Total Marks = 80
Total Marks = 70

Time = 90 Minutes
Time = 90 Minutes

Total Marks of the Paper I = 150

Total Time = 03 Hours

Grand Total = 150

Sr. No.	Topics Covered in Paper I	No of SEQs	No of MCQs
1.	Dental Waxes	01	10
2.	Cast Metals	01	13
3.	Polymers & Denture Base Resins (DBA)	01	14
4.	Wrought Metals	01	13
5.	Ceramics	01	14
6.	Dental Procedures & Instruments	01	08
7.	Tissue Engineering / Emerging technologies	01	08
8.	TOTAL	07	80

Table of specification

Paper I

Sr. no	Table of specifications	No. of MCQs	No. of SEQ
1.	<p>Dental Waxes Classification, Ideal requirements, Properties, types, Uses, Manipulation.</p>	10	1
2.	<p>Cast Metals <i>I. Fundamentals:</i> Structure & constitution of cast metals: Metallic bonding, Classification systems, solidification and microstructure of cast dental alloys, solid solutions, equilibrium phase diagrams, eutectic, peritectic reactions. Composition, Properties, Applications of cast metals; high noble, noble & primarily base metals. <i>II. Biocompatibility of cast dental alloys</i> <i>III. Aging of cast dental alloys</i></p>	13	1
3.	<p>Polymers & Denture Base Resins (DBA) <i>I. Fundamentals of Polymers:</i> Thermoset & thermoplastic polymers, Components & composition of polymers. Mechanical & physical properties of polymers, Polymerization reactions. Dentures Base Resins (DBA): Composition, Classification, Ideal requirements, Properties, Uses, Processing, Applications & clinical handling, Finishing & polishing of denture base acrylic, Materials for Maxillofacial Prostheses. Repair and reline materials, tissue conditioners. <i>II. Biocompatibility of DBA,</i> <i>III. Aging of DBA</i> <i>IV. New advancements in DBA.</i></p>	14	1
4.	<p>Wrought Metals <i>I. Fundamentals</i> Structure, composition, Applications & Properties of: Steel & Stainless steel, nickel titanium, beta titanium, cobalt-chrome nickel, wrought CP Titanium. Strengthening mechanisms involving dislocations. Cold working, annealing. <i>II. Biocompatibility</i> <i>III. Aging of wrought alloys</i></p>	13	1

	Direct filling gold restoration ; composition ,classification, properties, Applications & clinical handling.		
5.	<p>Ceramics I. Fundamentals : Structure, Classification, composition, Applications & clinical handling, Sintering, Vacuum firing, properties and methods of strengthening ceramics, abrasiveness of dental ceramics. Porcelain denture teeth</p> <p>Metal fused to ceramic restorations: Steps of fabrication, technical aspects of metal ceramic products, Metal ceramic bond mechanism, MFC based on swaged metal foil laminates, Benefits & drawbacks of metal-ceramic restorations compared with all-ceramic restorations. All ceramic fabrication techniques ; fabrication, advantages & disadvantages, indications/contraindication of types: Conventional powder-slurry system(Vita), Infiltrated glass ceramics (In-ceram), castable glass ceramics, pressable ceramics, Machine able ceramics (Copy milling & CAD-CAM) Clinical performance of all-ceramic restorations.</p> <p><i>II. Aging of ceramics</i> <i>III. Biocompatibility of ceramics</i> <i>IV. Hard tissue bonding</i></p>	14	1
6.	<p>Dental Procedures & Instruments Abrasion, Cutting, Grinding, Finishing & Polishing, Soldering & welding, Casting , Sandblasting. Hand & Cutting Instruments.</p>	08	1
7.	<p>Tissue Engineering / Emerging technologies <i>Tissue engineering</i></p> <ul style="list-style-type: none"> • Sources of tissue grafting; auto graft, allograft, xenograft, alloplast. • Strategies for tissue engineering • Stem cells, biomaterials & scaffolds • Cell culture methods • Tissue engineered dental tissues <p><i>Emerging technologies related to dental biomaterials</i></p>	08	1
	Total	80	07

M. Phil Science of Dental Materials (Major Complusary)

Major Paper-II

TABLE OF SPECIFICATIONS

The grey areas of the course whose learning cannot be evaluated or are difficult to cover in MCQ's shall be used for framing SEQ's, which may be split into two parts if necessary; attempt shall be made to avoid duplication between MCQ'S and SEQ's. Distribution of MCQ's and SEQ's is with respect to the importance of topics. Table of Specification is also provided with the document

Note:

MCQ's = 80
SEQ's = 07

Total Marks = 80
Total Marks = 70

Time = 90 Minutes
Time = 90 Minutes

Total Marks of the Paper II = 150

Total Time = 03 Hours

SR. No	Topics Covered	No of SEQs	No of MCQs
1.	Gypsum & Investment Materials	01	10
2.	Adhesion, Standardization, Physical & chemical and Mechanical properties of dental materials Biocompatibility	01	12
3.	Dental Cements	01	12
4.	Amalgam	01	12
5.	Resin Based Composites & related materials	01	12
6.	Dental Implants & Suture material	01	10
7.	Impression Materials	01	12
	TOTAL	07	80

TABLE OF SPECIFICATIONS-PAPER II

Sr. No.	Table of specifications	No. of MCQs	No. Of SEQs
1.	Gypsum & Investment Materials <i>I. Fundamentals:</i> Classification, Ideal requirements, Properties, types, uses, Manipulation, Model and die materials, care for cast, Disinfection of cast, test for gypsum.	10	1
2.	Structure of matter and principles of adhesion (surface properties of dental materials), Atomic building blocks. Standardization of dental materials Physical & chemical properties of dental materials Mechanical properties of dental materials Determination of Biocompatibility <ul style="list-style-type: none"> • Evaluation of Materials • Principles of Biocompatibility Testing • Strategies for Evaluating Biocompatibility • biocompatibility tests • Systemic Toxicity • Local Toxicity and Tissue Compatibility • Cell Cultures • Implantation Tests • Pulp Damage and the Pulp/ Dentin Test • Mucosal Damage and Mucosa Usage Tests • Periapical Tissue Damage and Endodontic Usage Test • Intraosseous Implant Test • Allergenic Properties • Mutagenicity • Teratogenic Effects and Influence on Reproduction • Prick Test • Radioallergosorbent Test (RAST) • Immunotoxicological Test Methods • Measurement of Intraoral Voltage • Evaluation of Pulp Sensitivity 	12	1
3.	Dental Cements <ul style="list-style-type: none"> • <i>Following aspects of Zinc Oxide Eugenol, Zinc Phosphate, Zinc Carboxylate, Glass Ionomer Cement, Calcium Hydroxide, Cavity Varnish, Resin Cement, Root canal filling materials:</i> <i>I. Fundamentals</i> Classification, Ideal requirements, Compositions, Setting Reactions,	12	1

	<p>Properties ,types , Applications, Clinical Handling & finishing polishing, <i>II. biocompatibility, III Aging , IV.Hard tissue bonding, V. Recent advancements.</i></p> <ul style="list-style-type: none"> • Dentifrices, Fluoride and materials for prevention of progression of caries. • Pit & fissure sealants. 		
4.	<p>Amalgam <i>I. Fundamentals:</i> Classification, Composition , Properties ,types , uses, Amalgamation Reactions, manipulation, biocompatibility, Applications, Clinical handling & finishing polishing, Amalgam Hygiene, Repair of amalgam restorations. <i>II. Biocompatibility</i> <i>III In vivo aging</i></p>	12	1
5.	<p>Resin Based Composites & related materials Classification, Composition, Ideal requirements, Properties, types, Applications & clinical handling, Innovations in dental composites. Other resin based materials. Indirect Composites, Repair of composites. Testing for dental composites. Biocompatibility, Aging &Hard tissue bonding of resin-based restorative materials Enamel & dentin bonding; acid etch system, smear layer, hybrid layer, Classification/Generations of dentin bonding system, hard tissue bonding, biocompatibility , Aging, Bond strength testing.</p>	12	1
6.	<p>Dental Implants & Suture material Dental Implant: Classification, Types of integration with the surrounding tissues, Factors affecting Osseo integration, Metallic & non-metallic materials for implants: Titanium & its alloys, Surface texturing of metallic implants, ceramic coated implants, biocompatibility, Aging of implant biomaterial, Current Advancements in implant biomaterials. Sutures : fundamentals, biocompatibility & aging</p>	10	1
7.	<p>Impression Materials Following aspects of Polysulphides, Silicones, Polyether, Hydrocolloids, Impression compound, Zinc oxide eugenol impression paste, impression waxes, impression plaster: Classification, Ideal requirements of impression materials, Properties, types, uses, Applications & clinical handling, biocompatibility, Disinfection, Impression techniques, Recent Advancements.</p>	12	1
	Total	80	07