Periodontal Regeneration

Multiple choice questions /answer all 25 questions /each question contain 1 mark

* Indicates required question

Email *

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Name: *
Roll no:
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Your answer

1. Pass principle is based on all except? * 1 point

- a. space maintenance
- b. primary wound closure
- c. secondary wound closure
- d. stability of blood clot

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2.what is the role of fibroblast in periodontal regeneration? * 1 point

- a. Bone resorption
- b. Collagen synthesis
- c. Cementum degradation
- d. Plaque inhibition

3. Which cells are crucial for periodontal ligament regeneration? * 1 point

- Fibroblast
- Ameloblasts
- Odontoblasts
- Osteoclasts

4. Guided tissue regeneration (GTR) primarily involves the use of: * 1 point

- Antibiotics
- Barrier membranes
- Root planning
- none of the above

5. What is the primary goal of periodontal regeneration? * 1 point

- Reduce tooth mobility
- Eliminate oral bacteria
- Reconstruct lost periodontal tissues
- Whiten teeth

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6. Which of the following is a key component in periodontal regeneration? * 1 point

- Bone grafts
- Amalgam fillings
- Fluoride treatments
- Dental implants

7. Which type of graft material is derived from the patient's own body? * 1 point

- Allograft
- Xenograft
- Autograft
- Alloplast

8.What role do barrier membranes play in periodontal regeneration? * 1 point

- Stimulate bone formation
- Prevent infection
- Exclude epithelial cells from the wound site
- Deliver antibiotics

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9. Which growth factor is commonly associated with promoting periodontal regeneration? * 1 point

- ◯ Erythropoietin (EPO)
- ◯ Platelet-derived growth factor (PDGF)
- ◯ Thyroid hormone
- ◯ Insulin

10. Bone morphogenetic proteins (BMPs) are used in periodontal regeneration for: * 1 point

- ◯ Inhibiting bacterial growth
- ◯ Promoting cementum formation
- ◯ Enhancing bone formation
- ◯ Stimulating gingival tissue repair

11. The use of enamel matrix derivatives (EMD) in periodontal therapy is primarily aimed at: * 1 point

- ◯ Enhancing gingival thickness
- ◯ Stimulating periodontal ligament formation
- ◯ Reducing tooth sensitivity
- ◯ stimulate bone synthesis

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12. Which of the following is NOT a method used in periodontal regeneration? * 1 point

- Bone grafting
- Scaling and root planing
- Guided tissue regeneration
- Enamel matrix derivative application

13. The main advantage of using autogenous bone grafts in periodontal regeneration is: * 1 point

- Reduced cost
- Lower infection risk
- Better osteogenic potential
- Ease of procurement

14. Periodontal regeneration aims to restore which specific structures? * 1 point

- Enamel and dentin
- Gingiva and alveolar bone
- Periodontal ligament, cementum, and alveolar bone
- all of the above

15. Xenografts in periodontal regeneration are obtained from: * 1 point

- Human donors
- Synthetic materials
- Animal sources
- The patient's own body

16. Which of the following materials is often used as a scaffold in tissue engineering for periodontal regeneration? * 1 point

- Titanium mesh
- Hydroxyapatite
- Enamel matrix derivative
- Composite resin

17. Which technique involves the application of a membrane to direct the growth of new bone and gingival tissue at sites having insufficient volumes for proper function? * 1 point

- GTR
- GBR
- Flap surgery
- Crown lengthening

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18. Alloplasts are graft materials made from: * 1 point

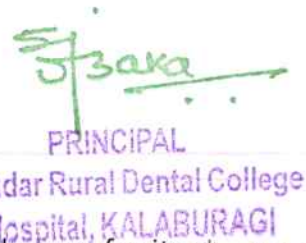
- Synthetic substances
- Human tissue
- Animal tissue
- The patient's own tissue

19. Melchers principle was given in the year? * 1 point

- 1974
- 1975
- 1972
- 1978

20. Enamel matrix derivative (EMD) is derived from: * 1 point

- Porcine tooth buds
- Bovine bone
- Human saliva
- Synthetic polymers



21. Platelet-rich plasma (PRP) used in periodontal therapy is known for its: * 1 point

- High bacterial content
- Growth factor concentration
- Enamel matrix proteins
- High collagen content

22. Which of the following is an essential criterion for the success of guided tissue regeneration? * 1 point

- Rapid epithelial migration
- Bacterial contamination
- Maintenance of space for new tissue growth
- Immediate implant placement

23. The main purpose of using bioactive glass in periodontal regeneration is to: * 1 point

- Act as a barrier membrane
- Promote bone formation
- Enhance gingival attachment
- Reduce tooth sensitivity

24.One of the primary challenges in periodontal regeneration is: * 1 point

- Patient compliance with oral hygiene
- Selecting the right shade of restorative material
- Achieving immediate aesthetic results
- Reducing treatment time

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25. What is the role of cementoblasts in periodontal regeneration? *

- ◯ Forming new bone
- ◯ Forming new cementum
- ◯ Breaking down old cementum
- ◯ Creating new gingival tissue

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Department of Periodontology

Mid-Course Exam- IV BDS Referred Batch (20/06/2023)

Answer all the questions

Draw neat labelled diagrams wherever necessary

Maximum Marks: 70

Long Essay 2X10=20

1.Define gingiva. Write in detail about the microscopic and macroscopic features of gingiva.

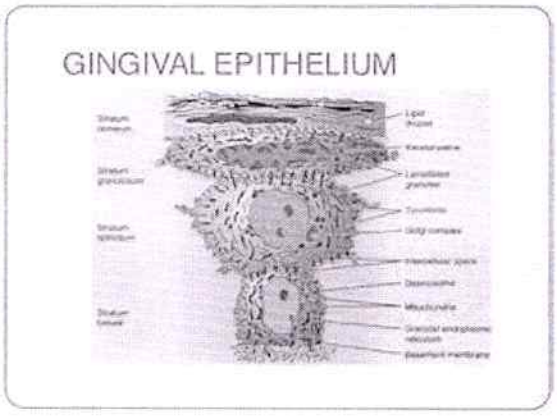
Ans) Gingiva is the part of the oral mucosa (masticatory mucosa) that covers the alveolar process of the jaws and surrounds the necks of the teeth.

- General microscopic features of gingival epithelium:

-1. Non-keratinized (Sulcular and junctional epithelium)

-2. Keratinized (Oral epithelium) and it consist of Four cell layers:

- Stratum Basale (Basal layer)
- Stratum spinosum (prickle cell layer)
- Stratum granulosum (granular layer)
- Stratum corneum (cornified layer)



Macroscopic Features:

1.Color: Healthy gingiva typically exhibits a coral pink color, although variations can occur based on individual factors such as ethnicity, age, and pigmentation. Changes in color, such as redness or bluish discoloration, can indicate inflammation or underlying health issues.

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2. Texture: The texture of the gingiva is usually stippled, resembling the surface of an orange peel. This stippling is more pronounced in some individuals than in others and tends to diminish with age or in the presence of gingival disease.

3. Contour: The gingiva forms a scalloped contour around the teeth, adapting closely to the tooth surface. The gingival margin forms a shallow, V-shaped indentation called the gingival sulcus, which is the space between the tooth surface and the free gingival margin.

4.Thickness: Gingival thickness can vary among individuals and across different regions of the mouth. Thicker gingiva may provide better protection against mechanical trauma, while thin gingiva may be more prone to recession and periodontal disease.

5. Size: The size of the gingiva can vary based on factors such as tooth size, tooth position, and overall oral health. In some cases, gingival enlargement (hypertrophy) or recession may occur due to underlying conditions or medications.

•Free Gingival Margin: This is the edge of the gingiva that borders the tooth and is visible in the oral cavity. It should form a tight seal around the tooth.

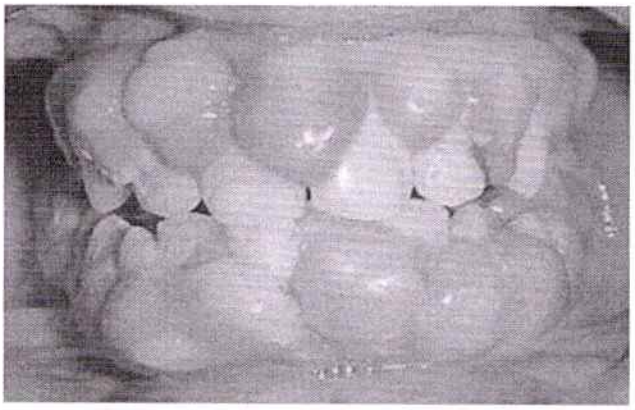
•Attached Gingiva: The gingiva that is firmly bound to the underlying bone and tooth roots, providing stability and support.

•Interdental Papilla: The triangular-shaped gum tissue between adjacent teeth. Properly shaped papillae contribute to an aesthetically pleasing smile.

•Mucogingival Junction: The boundary between the attached gingiva and the more movable alveolar mucosa. Its location can influence the stability of dentures and other dental appliance

2.Define gingival enlargement. Write in detail about the drug induced gingival enlargement.

-Ans) Increase in size of the gingiva is gingival enlargement and gingival overgrowth.



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•Drug induced- gingival enlargement:

This condition is uncommon and occur due to drugs, such as phenytoin, cyclosporine and nifedipine. Various groups of drugs associated with gingival enlargement other than phenytoin, cyclosporine and nifedipine include valproic acid, succinimides, phenobarbitone and ethosuximide. Immunosuppressants other than cyclosporine are tacrolimus.

Calcium-channel blockers include nifedipine, nitrendipine, amlodipine, felodipine and others. Other agents include diltiazem and verapamil.

Aetiology: Long-term therapy of the respective drug

•Clinical features: Painless Bead-like enlargement of facial and lingual gingival

margins, Massive tissue folds covering the crowns of teeth interfering with occlusion, appears to project from beneath the gingival margin, Does not occur in edentulous spaces, More severe in maxillary and mandibular anterior region, and It may occur in mouths with little or no plaque and may be absent in mouths with abundant deposits.

•Histopathology: Hyperplasia of connective tissue and epithelium, Abundance of amorphous ground substance, Fibroblast to collagen ratio is equal to that of normal gingiva and the connective tissue appears highly vascularized in cyclosporine induced enlargement.

The enlargement is chronic and slowly increases in size. When surgically removed, it recurs. Spontaneous disappearance occurs within a few months after discontinuation of the drug.

Treatment options for drug-induced enlargements are-drug substitution and surgical therapy including gingivectomy or flap surgery.

Oral hygiene reinforcement, chlorhexidine gluconate rinses, scaling and root planning.

•Possible drug substitution. When it is attempted, it is necessary to allow at least a period of 6-12 months between the discontinuation of the offending drug and the possible resolution of gingival enlargement.

•Professional recalls.

Short Essay:

8*5=40

2.Explain in detail about the principles of instrumentation.

Ans)-PRINCIPLES OF PERIODONTAL INSTRUMENTS:

- ACCESSIBILITY: position of patient operator

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•VISIBILITY, ILLUMINATION & RETRACTION.

- Condition & sharpness of instruments.
- Maintaining a clean field.
- Instrument stabilization. Instrument activation.
- Accessibility means to facilitates thoroughness of instrumentation.
- Visibility, illumination and retraction
- Visibility means to see.
- Illumination means light
- Retraction means to retract
- Conditioning and sharpness of instrument: sharp instruments enhance tactile sensitivity & allow the clinician to work more efficiently.
- Instrument stabilization.
- Instrument grasp: modified pen grasp, standard pen grasp, palm and thumb grasp
- Finger rest: conventional, cross arch, opposite arch, finger on finger

□INSTRUMENT ACTIVATION

1) ADAPTATION: adaptation refers to the manner in which the working end of periodontal instrument is placed against the surface of tooth

2.ANGULATION: it refers to the angle between face of a bladed instrument and the tooth surface also called tooth -blade relationship

3) LATERAL PRESSURE: it refers to the pressure created when force is applied against the surface of tooth with the cutting edge of a bladed instrument

□STROKES: 3 types: - exploratory stroke

scaling stroke

root planning stroke

4.Functions of principle fibres of periodontal ligament.

Ans) Periodontal ligament is the soft, specialized connective tissue situated between the cementum covering the root of the tooth and bone forming the socket wall.

Principal fibres of periodontal ligament:

1. Transseptal group: Reconstructed even after destruction of the alveolar bone has occurred in the periodontal disease.

•Responsible for returning teeth to their original state after orthodontic therapy.

2. Alveolar crest group: Prevent extrusion& Prevent lateral tooth movements

3. Horizontal group

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4. Oblique group: (i) Bear vertical masticatory stresses& transform vertical stress into tension on the alveolar bone.

5.Apical group: (i) Prevents tooth tipping, Resists luxation Protects neurovascular supply to the tooth.

6.Interradicular group: Prevents luxation & Prevents tooth tipping and torquing.

5.Classification of periodontal disease and conditions.

-Ans) Periodontal diseases and conditions are broadly classified into several categories based on their

characteristics and severity. The two main categories are gingival diseases and periodontal diseases.

□Dental Plaque-Induced Gingival Diseases:

1. Plaque-Induced Gingivitis: Inflammation of the gingiva caused by dental plaque.

2.Non-Plaque-Induced Gingivitis: Inflammation without a significant plaque component, often related to systemic factors.

□Non-Dental Plaque-Induced Gingival Lesion:1. Gingival Lesions of Specific

Bacterial Origin: Associated with specific bacteria, such as those causing Vincent's infection or gonococcal infection.

2.Gingival Lesions of Viral Origin:

Viral infections contributing to gingival diseases.

3. Gingival Lesions of Fungal Origin: Fungal infections affecting

□Gingival Manifestations of Systemic Conditions: Gingival changes associated with systemic diseases like diabetes or blood disorders.

Periodontal Diseases:

1.Chronic Periodontitis: The most common form, characterized by slow progression of inflammation and attachment loss.

2.Aggressive Periodontitis: Rapid progression of attachment loss and bone destruction, often with a familial aggregation.

3.Periodontitis as a Manifestation of Systemic Diseases: Periodontal diseases associated with systemic conditions like diabetes.

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4.Necrotizing Periodontal Diseases: Characterized by necrosis of gingival tissues, often with rapid progression. Includes necrotizing ulcerative gingivitis (NUG) and necrotizing ulcerative periodontitis (NUP).

5.Periodontitis Associated with Endodontic Lesions: Inflammation extending from the tooth pulp into the periodontal tissues.

6.Developmental or Acquired Deformities and Conditions: Conditions affecting tooth eruption or development, impacting the periodontium.

7.Mucogingival Conditions: Conditions affecting both the gingiva and the mucosa, such as gingival recession.

6.Stages of plaque formation.

-Ans) The formation of dental plaque is a dynamic process that occurs in stages, leading to the accumulation of bacteria on tooth surfaces. Here are the stages of plaque formation in periodontics:

□Pellicle Formation: Salivary proteins quickly adhere to the tooth surface, forming a thin film known as the pellicle. This provides a foundation for bacterial attachment.

□Initial Adhesion (Acquired Pellicle): Bacteria, primarily gram-positive cocci, attach to the pellicle through weak electrostatic forces. This initial adhesion is reversible.

□Bacterial Multiplication: Attached bacteria multiply rapidly, forming microcolonies. Gram-positive cocci dominate in the early stages, creating a diverse microbial community.

□Biofilm Maturation: The biofilm becomes more complex with the incorporation of gram-negative bacteria, including anaerobes. Extracellular polysaccharides (EPS) produced by bacteria contribute to biofilm structure.

□Matrix Formation: Extracellular matrix components, such as glucans and fructus, are produced by bacteria within the biofilm. This matrix helps hold the biofilm together and adheres it to the tooth surface.

□Coaggregation and Succession: Different bacterial species adhere to each other through coaggregation, contributing to the diversity of the biofilm. Succession involves changes in the microbial composition over time.

□Mature Biofilm: The biofilm matures into a complex and organized structure, with a diverse array of bacterial species. This mature biofilm is resistant to mechanical removal and contributes to the development of dental plaque.

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□Plaque Mineralization (Calcification):If not regularly disrupted by oral hygiene measures, the plaque can mineralize, forming calculus (tartar). Calculus provides a rough surface for further plaque accumulation.

7. Definition, Classification and clinical features of Chronic periodontitis.

-Ans) Chronic periodontitis is a common form of periodontal disease characterized by inflammation of the supporting structures of the teeth, gradual attachment loss, and bone destruction. It typically progresses slowly over time and can lead to tooth mobility and eventual tooth loss if left untreated.

□Classification:

Chronic periodontitis can be classified based on severity:

- Mild Chronic Periodontitis: Minimal attachment loss, usually less than 1-2 millimetres.
- Moderate Chronic Periodontitis: Moderate attachment loss, typically between 3-4 millimetres.
- Severe Chronic Periodontitis: Significant attachment loss, exceeding 5 millimetres, often associated with tooth mobility.

□Clinical Features: Gingival Inflammation: Mild to moderate inflammation of the gingiva, usually with redness and swelling.

- Pocket Formation: Formation of periodontal pockets as a result of the detachment of the gum tissue from the tooth, leading to spaces where bacteria can accumulate.
- Attachment Loss: Gradual loss of connective tissue attachment to the tooth, leading to the exposure of the tooth root.
- Bone Resorption: Progressive loss of alveolar bone around the affected teeth, visible on radiographs.
- Tooth Mobility: As the disease advances, affected teeth may exhibit increased mobility.
- Dental Plaque and Calculus Accumulation: Presence of bacterial biofilm (plaque) and mineralized deposits (calculus) on tooth surfaces, contributing to the inflammatory process.
- Bleeding on Probing: Bleeding from the gingival sulcus or pocket upon gentle probing is a common clinical sign.
- Halitosis (Bad Breath): The accumulation of bacteria and their byproducts can contribute to unpleasant breath.

8. Define pocket. Write the clinical features, pathogenesis and histology of periodontal pocket.

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-Ans) A periodontal pocket is a pathological deepening of the gingival sulcus, the space between the tooth and the surrounding gingival tissue. It occurs as a result of inflammatory processes that lead to the loss of connective tissue attachment and destruction of supporting structures around the tooth.

□Clinical Features:

- Pocket Depth: Measurement of the depth of the space between the tooth and the gingiva. Normal sulcus depth is up to 3 mm, whereas pockets in periodontal disease can range from 4 mm to several millimetres deep.
- Gingival Inflammation: Pockets are often associated with redness, swelling, and inflammation of the gingival tissues.
- Bleeding on Probing (BOP):Pockets frequently exhibit bleeding when gently probed, indicating active inflammation.
- Suppuration: In more advanced cases, pockets may produce pus (suppuration), a sign of active infection.
- Attachment Loss: Pockets are indicative of the loss of connective tissue attachment to the tooth, leading to exposure of the tooth root.

□Pathogenesis:

- Plaque Accumulation: Initiated by the accumulation of dental plaque on tooth surfaces, especially below the gumline.
- Inflammatory Response: Plaque bacteria trigger an inflammatory response, leading to the release of cytokines and enzymes that degrade the connective tissue attachment.
- Connective Tissue Destruction: The inflammatory process results in the breakdown of collagen fibres in the gingival connective tissue, causing the detachment of the gingiva from the tooth.
- Bone Resorption: As the inflammation progresses, alveolar bone surrounding the tooth is resorbed, contributing to pocket formation.
- Pocket Maintenance: Ongoing plaque accumulation within the pocket sustains inflammation and prevents the healing of the periodontal tissues.

□Histology: The epithelium lining the pocket undergoes proliferation, forming a long junctional epithelium. Infiltration of inflammatory cells, including neutrophils, lymphocytes, and macrophages, into the pocket tissues. Fibrotic changes and degradation of collagen fibres within the connective tissue contribute to attachment loss. Resorption of alveolar bone is evident in the histological examination of the periodontal pocket.

9.Periodontal treatment of medically compromised patients.

-Ans) Periodontal treatment for medically compromised patients requires careful consideration of the patient's overall health status and coordination with their healthcare providers. Here are key considerations:

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•Medical History Review: Thoroughly review the patient's medical history to identify any existing medical conditions, medications, or systemic issues that may impact periodontal treatment.

•Collaboration with Healthcare Providers: Communicate and collaborate with the patient's primary care physician or other specialists to understand the overall medical condition and ensure a coordinated approach to treatment.

•Risk Assessment: Conduct a comprehensive risk assessment to evaluate the potential impact of systemic conditions on periodontal health and vice versa.

•Medication Considerations: Consider the impact of medications on oral health, such as those causing xerostomia (dry mouth) or medications that may affect bleeding tendencies.

•Treatment Modification: Modify periodontal treatment plans based on the patient's medical status. For example, patients with compromised immune systems may require adjustments to treatment protocols.

•Special Considerations for Systemic Conditions: Tailor the treatment approach for conditions such as diabetes, cardiovascular diseases, or autoimmune disorders, considering their impact on healing and inflammation.

•Preventive Measures: Emphasize preventive measures, including meticulous oral hygiene and regular professional cleanings, to minimize the risk of infections.

•Antibiotic Prophylaxis: Consider antibiotic prophylaxis for patients with certain medical conditions (e.g., cardiac conditions) to prevent infective endocarditis. Follow established guidelines.

•Close Monitoring: Regularly monitor and reassess the patient's periodontal status, adapting treatment plans as needed based on the response to therapy and changes in overall health.

•Patient Education:

•Educate patients about the bidirectional relationship between periodontal health and systemic health. Encourage lifestyle modifications that support both.

•Stress Management: Recognize the potential impact of stress on periodontal health and consider stress management techniques for patients dealing with chronic medical conditions.

10.Defence mechanism of gingiva

-Ans) Defence mechanism of gingiva:

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Gingival tissue Constantly subjected to mechanical trauma and bacterial aggression Saliva, Epithelial surface and inflammatory response provide resistance to these actions

1. Gingival sulcular fluid: The value of the gingival fluid is that it can be represented as either a transudate or an exudate. The gingival fluid contains a vast array of biochemical factors, thereby offering its potential use as a diagnostic or prognostic biomarker of the biologic state of the periodontium in health and disease. It also contains compo nents of connective tissue, epithelium, inflammatory cells, serum, and microbial flora that inhabit the gingival margin or the sulcus.

COMPOSITION:

The components of GCF are characterized by individual proteins, metabolites, specific antibodies, antigens, and enzymes of

several specificities. The GCF also contains cellular elements. Multiple research efforts have attempted to use GCF components

Clinical significance:

GCF is a biologic fluid that has potential in diagnostics and disease management.The amount of GCF is greater when inflammation is present, and it is sometimes proportional 2.SALIVA: Saliva has protective functions and maintains the oral tissues in a physiologic state. Saliva exerts a major influence on plaque by mechanically cleansing the exposed oral surfaces, buffering acids produced by bacteria, and modulating bacterial activity with immune mediators.

Short Answers:

5*2=10

11.Gingival index

-Ans) Developed by Loe H and Silness P in 1963. 0-Normal gingiva.

1-Mild inflammation: Slight change in colour and slight edema. No bleeding on probing.

2. Moderate inflammation: Redness, edema and glazing. Bleeding on probing.

3-Severe inflammation: Marked redness and ulceration. Tendency towards spontaneous bleeding

□Total GI score: 0.1 to 1.0: Mild inflammation

1.1 to 2.0: Moderate inflammation

2.1 to 3.0: Severe inflammation.

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12.Types of cementum

-Ans) 1) Based on cellularity:

1-Cementum containing cells:

a. Cellular cementum.
b. Intermediate cementum
c. Acellular cementum

II) Based on fibrillar connotation:

1. Intrinsic fibres cementum

2. Extrinsic fibres cementum

3. Mixed fibres cementum

4.Afibrillar cementum

13.Fenestration & Dehiscence

-Ans) Fenestration: Isolated areas in which root is denuded of bone and root surface is covered by gingiva and periosteum, where marginal bone is intact

Dehiscence: When the denuded areas extend through the marginal bone, the defect is called dehiscence.

14.Compliment system

-Ans) Polymorphonuclear neutrophils (PMNs or neutrophils) play a crucial role in the response within the periodontal tissues

Functions: First Line of defence, chemotaxis, Phagocytosis, Microbial Killing

15.Composition of calculus.

-Ans) consists of organic matrix (20%) & Inorganic portion mainly containing –

- •Calcium Phosphate
- CaCO; (less amount)
- Mg (POA)2
- Trace minerals
- Ca (PO)2 crystals in both type of calculus consists of Octa calcium phosphate (OCP), Brushite (precursor of apatite-CaHPO.2H20)
- Whitlockite a form of calcium phosphate Cao (Mg, Fe++) (P04)6(POOH)), Hydroxyapatite

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