

10/6/22

B. Mounika

Dental materials

Essay

1. Classify Dental Cements. write Composition, classification and setting Reaction of Glass Ionomer Cement

4 Marks

2. Spore former
3. Sandwich technique
4. Calcium hydroxide Cements
5. Composition and Requirement of Pulley wax

15
 35

2 Marks

6. No gemol
7. MTA
8. Divestment
9. Zones of Flame
10. Die Spacers.

CH. Anup

Answers

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8a) Divestment

- Mixture of Dye and Investment is called Divestment
- It is a gypsum bonded alloy
- It is used in conventional Gold alloy technique.
- So, it is called Divestment.

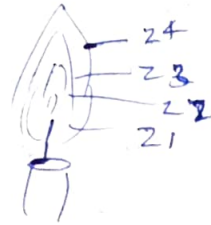
8b) Die Spacers

A solution of die spacer is coated on axial and occlusal surface of the tooth. This provides space for the cast and restoration.

9A) Zones of flame

There are four zones in the flame they are

- Zone-1 - Mixing zone
- Zone-2 - Combustion zone
- Zone-3 - Reducing zone
- Zone-4 - Oxidizing zone



7A) MTA

MTA stands for mineral trioxide Aggregate

- It is used as Root and filling material
- It is of two types they are 1) Grey MTA
2) White MTA

8) Eugenol

- It is non eugenol cement
- used in eugenol allergic / sensitive patients
- Liquid contains HV-EB-ACD
- Powder content ZnO - 60-70%
- It has high strength than ZOE

2A) Spruce former

used in casting titanium



4A) Calcium hydroxide Cement

- They are weak cements
- It has alkaline nature

Composition

powder

Glycol salicylate
Titanium dioxide

liquid

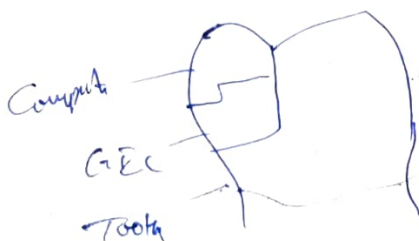
zinc
ethylene oxide
stearic

- It is used for formation of separation denture
- It is used as base.

3A)

Sandwich technique

- Composite resin directly doesn't bond with the tooth structure
- GIC & chemically bond with tooth
- ~~used~~ GIC is chemically bond with composites also
- So GIC is placed between the composite and cavity like a sandwich
- It chemically bonds with tooth and composite made a strong restoration
- This technique is known as sandwich tech.



Sandwich technique.

5A) Inlay wax

- Inlay wax is used in lost wax technique.
- It may be purple, ivory and white in color.

Requirements

- It should not cause discoloration
- It should be easy to carve
- It should not be sticky
- It should not shrink

1A) Dental Cements

Classification

Based on

1) water based cements

- GEC
- RM GEC
- zinc poly carbonate

2) oil based cements

- ZEO
- NZEO

3) Resin based cements

- Composites
- Compomers

Nonovant classification

① ZOE

- zinc phosphate
- zinc poly carboxylate

② Resin modified cements

11/6/22

Microbiology

P. Sai Kumar

① Classify spirochetes. Describe clinical features & laboratory diagnosis of syphilis?

A) Spirochetes are elongate motile bacteria twisted spirally along the long axis.

⇒ Classification:

- A. Treponema - T. Palladium
- B. Leptospira - L. interrogans
- C. Borrelia - B. vincenti

17
35

K. Jayathra

⇒ Clinical features of syphilis:

1. Primary syphilis

- * Hard chancre
- * Heals spontaneously in days

2. Secondary syphilis

- * Roseolar or papular skin rashes
- * mucous patches in oropharynx

3. Latent syphilis

4. Tertiary syphilis

- * Develop after years, characterized by development of granulomatous lesions (gumma) in skin, bone

5. Congenital syphilis

- * Hutchinson's triad (keratitis, Hutchinson's teeth, 8th nerve deafness)
- * Saddle-shaped nose

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⇒ Laboratory diagnosis:

A. Microscopy:

- 1. Dark ground microscopy
- 2. Direct fluorescent antibody test

B. Serological tests:

- 1. Group specific treponemal tests

2. Specific treponema palladium tests

3. Reagin antibody tests.

② Short note on Caries activity test?

A) Classification:

A) Tests for evaluating microbiology activity

1. Lactobacillus Colony Count test
2. Dip slide method
3. Snyder's test
4. Swab test

B) Tests for evaluating saliva defense

1. Saliva flow rate
2. Viscosity of saliva
3. Buffering capacity of saliva.

⇒ Ideal requirements:

1. Should have sound theoretical basis
2. Should have maximum correlation with clinical status
3. Be accurate with respect to duplication of results

③ Short note on VDRL Test?

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A) Principle: Patients suffering from syphilis produce antibodies that react with cardiolipin antigen in a slide flocculation test.

Procedure: In this test, the inactivated serum is mixed with cardiolipin antigen on a special slide & rotated for 4 minutes. Cardiolipin remains as uniform crystals in normal serum but forms visible clumps on combining with reagin antibody.

Results: Results reported qualitatively as "reactive", "weak-reactive", "non-reactive".

VDRL Test can be used for testing CSF also, but not plasma.

Morphology, culture characteristics and pathogen potential of Porphyromonas gingivalis?

A) Porphyromonas gingivalis appears to be one of the prime etiological agents in pathogenesis & progression of inflammatory events of Periodontal disease.

* P. gingivalis is non-motile, asaccharolytic, Gram(-ve) rod like, obligate anaerobe

* Forms black pigmented colonies on blood agar plate.

Virulence factors:

1. Enzymes (hyaluronidase) - Decreases phagocytosis for invasion
2. Lipopolysaccharides - Bone resorption, immunoglobulin protease
3. Fimbriae, exopolysaccharide - Adhesion or attachment to host outer membrane
4. Collagenase, trypsin like protease - Degradation of plasma Protease inhibitors
5. Aminopeptidase = Degradation of iron transport protein.

⑤ Write a short note of diphtheria?

A) Diphtheria most commonly an infection of upper respiratory tract, cause fever, malaise, sore throat.

Classification:

- 1) Malignant / hypertoxic - severe toxemia with bull neck
- 2) Septic - leads to ulceration, cellulitis & gangrene of pseudomembrane
- 3) Hemorrhagic - Bleeding from edge of membrane, epistaxis

Complication: Asphyxia, acute circulatory failure, sepsis

Lab diagnosis:

1. smea examination of swab

2. Culture swab - In vivo tests

In vitro tests - Elek's gel precipitation test

Treatment:

+ ADS (20,000, -100000)

+ Penicillin

* Erythromycin

⑦ List of anaerobic micro-organisms associated with Oral cavity

- A) Gram -ve rods - spp. Selenomonas
Prevotella spp
Porphyromonas spp

Gram -ve cocci - Veillonella - sp
Gram +ve cocci - Preptostreptococcus

⑧ Tetanus & its symptoms?

A) Tetanus is an acute bacterial disease caused by Clostridium tetani.

- * Gram +ve, obligate anaerobes, flagellate organism
- * Spores survive in soil & contaminated wounds

⇒ Symptoms :

- * Spasms, hyperactivity of voluntary muscles
- * Trismus / Lock jaw
- * Neck stiffness, abdominal rigidity
- * Opisthotonus

⑨ Risk factors on needle stick injuries?

- A) * Overuse of injection & unnecessary sharps
* Re capping of needles after use
* Passing instruments from hand - hand in operating site
* Lack of awareness of hazard & lack of training

⑩ Flash sterilization?

- A) Flash sterilization is considered acceptable for processing, cleaned patient-care items that cannot be packaged, sterilized, and stored before use. It is also used when there is insufficient time to sterilize an item.

⑪ Laboratory diagnosis of Pulmonary TB?

- A) 1. AFB sputum smear microscopy
B. Sodium hypochlorite
C. Cultures
D. Sensitivity tests
E. Animal inoculation.

Handwritten signature

RETESTS AND ANSWER SCRIPTS

10/9/22

Dental materials

Essay

1) Classify casting defects write in detail the reasons, defects and methods to avoid them.

25
35

EM

- 2) RMGIC
- 3) Dental Varnish
- 4) Casting Malocclusion
- 5) Classify Investment materials, Discuss in brief about gypsum bonded Investment materials.

CH. Anup

EM

- 6) Gutta percha
- 7) Anhydrous Cement
- 8) Cornel
- 9) Casting Ring Liner
- 10) Lost wax technique

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②A) Resin Modified Glass Ionomer Cement [RMGIC]

when GIC is mixed with Resin it is called Resin Modified Glass Ionomer Cement

- It has Refractive Index similar to tooth
- It has more tensile strength than GIC
- The solubility is decreased
- HEMA - hydroxy ethyl methacrylate is added
- It is of 2 types they are

①) Paste

- a) Base paste
- b) Catalyst paste

②) Light Cure

①) Light Cure (single light)

②) DiCure.

- Light Cure worked only when blue light passed

Paste system;

- In paste system both paste are mixed base and catalyst paste reacts to form the RMGIC.

Light system)

- In this visible blue light is used for single light system
- DiCure both Infrared (IR) light and normal light both are used to cure and form the RMGIC.

3A) Dental Varnish

- Varnish is a combination of natural (or) synthetic resin and a solvent which is usually acetone, Benzene (or) alcohol. sometimes Eugenol is also present.
- when a layer of varnish is coated with solvent evaporates and leave a thin layer of resin with porosity.
- Varnishes are coated on the cavity.
- when a ^{single} layer of varnish is coated so as to obtain a uniform layer of varnish.
- two thin layers are more effective than one thick layer.
- Varnish should be coated on the cavity except the proximities of pulp surface margin involve to prevent the solvents in oral cavity which may lead to necrosis.

Uses

- It provides sealant to freshly restored amalgam.
- It act as thermal insulator.
- It prevents the contaminants from amalgam restoration to enter the dentinal tubules which may lead to discoloration.
- It prevents sensitization.
- Fresh coat of varnish on GIC prevents over hydration.

Disadvantages

- It can't be used in composites because it inhibits copolymerization.
- It can't be used under the GIC involve & prevent chemical bonding of GIC with tooth.

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6A Gutta percha :

- Gutta percha was initially used as Restorative material now it is used as indispensable endodontic filling material
- Its molecular structure is similar to natural Rubber
- GUTTA - gum meaning
PERCHA - tree
- It is heated and pressed
- Gutta percha shrinks on cooling
- It is used as Root canal filling material.

7A Anhydrous Cement

- These are also called as water-setting cements
- The polyacrylic acid powder is freeze dried and mixed with liquid which is water (or) water with tartaric acid. when the powder is mixed with water it forms a solution
- These are called water setting cements.

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8A Cermet

- Composite material are composed of ceramic and metallic materials. A Cermet is ideally designed to have the optimal properties of both a ceramic, such as high temperature resistance and hardness and those of a metal, such as the ability to undergo plastic deformation.

Composition! Cermet : tungsten Carbide, molybdenum boride and aluminum oxide.

metals : Iron, Cobalt, Nickel and Chromium

(A) Casting Ring Liner

- It is a Liner that is coated inside the casting ring
- It should be 1mm short at one end
- It is used for mould expansion
- It provides space for metal expansion
- It is used in metal crown fabrication.

(B) Lost wax technique

Wax pattern of restoration is made on die with patterns. wax 'sprue', base and casting ring are added and then sprue and pattern are inserted (filled with gypsum based material). After investment set, base of sprue is removed and inverted pattern and sprue are placed into oven to burn out wax. Once wax is burned out, space remains where sprue and wax pattern. Molten metal is cast into the space.

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2A) Casting Defects

- Due to the innumerable procedures in casting an alloy there may be some defects
- Due to these defects the alloy cannot be fit into the mouth of patient.
- Casting Defects are classified as follows.

- 1) Distortion
- 2) Surface Discoloration, Irregularities, Roughness
- 3) Improper Casting
- 4) Porosity.

① Distortion

• Distortion may be due to thermal changes. Improper handling by the Impression taker, storage of the alloy

Prevention

- To prevent the thermal changes hard wax be preferred rather than soft wax which may melt
- Proper handling of the Impression tray should be maintained
- The cast alloy should be used immediately
- It should not be stored in refrigerator more than 30 mins

② Surface Discoloration, Irregularities, Roughness & Dist

Discoloration

- The alloy usually contains Carbon, oxygen, hydrogen and nitrogen
- These liberate CO₂, H₂O, NO on combustion with O₂ present
- when the temperature is low then there will be incomplete combustion.

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Roughness

- The height, size, length of the alloy matter
- Due to some defects there will be small bumps on the surface of the alloy.

Irregularities

- Some unwanted substance some time may be mixed with alloy and appear as irregularities.

Prevention

- To prevent discoloration the alloy must be heated at high temperature which is required for proper combustion
- Should ensure there are no bumps while pouring the cast alloy
- Unwanted substance should be filtered before hardening of the alloy.

Impure's Casting

- Insufficient intake alloy
- Alloy is not entering into the thin parts of mould.
- Back pressure occur due to gas in the mould.

Prevention

- proper amount of alloy should be measured and taken before pouring into the mould.
- The mould should be properly clean.

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4. Porosity

- Appear on alloy as small holes.

Prevention

proper handling

Q1) Casting machine

• Casting machine follow the principle of centrifugation.

There are 5 types of casting machine

1. Centrifugal casting machine
2. Electric arc casting machine
3. Vacuum type
4. Torch melted
5. Arc melted

Classification:

A) Based on methods of casting machine are

- 1) Centrifugal force type
- 2) Air pressure type
- 3) Vacuum type

B) Based on heating system employed

1. Torch melted
2. Induction melted
3. Arc melted.

Q2) Printout material

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① Define antigen and antibody. What are antigen-antibody reactions?

A) Antigen: Large organic molecule capable of stimulating production of specific antibody with which it may react specifically and in observable manner.

Antibody: They are substances which are formed in serum and tissue fluids in response to an Ag and react with that Ag specifically in observable manner.

Classification of Antigens:

A. Based on immunogenicity:

1. Complete Ag: Contains both immunogenicity and antigenicity.
2. Incomplete Ag / haptens: Contains only antigenicity eg: Cardiolipin Ag.

B. Based on chemical nature:

Proteins, Polysaccharides, nucleic acids, lipids

C. Based on need of T-cells:

Thymus dependent, thymus independent

D. Based on origin:

1. Exogenous Ag: eg: Bacteria
2. Endogenous Ag: eg: Blood group Ag

Antigen-Antibody reactions:

Ag-Ab reactions are interactions b/w Ag & specific Ab in an observable manner & form the basis of antibody mediated immunity.

Primary stage: Initial reaction involves formation of Ag-Ab complex without any visible effect. Reaction is rapid, reversible.

Secondary stage: stage of demonstrable event such as precipitation, agglutination, lysis of cells, killing of live antigens.

Tertiary reaction: chain of reactions lead to neutralization or destruction of injurious Ag or to tissue damage.

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* Air-borne dispersal :

Surrounding air contaminated with microorganisms.

* Self-contamination :

Physical migration of patients own endogenous flora to surgical site.

- Most wound infections manifest with a week of surgery.
- Strep. pyogenes & clostridial infections appear within 1-2 days.
- Staphylococcal infections typically take 4-5 days.
- Gram (-ve) bacillary take 6-7 days.
- Non-surgical sites of wound infections include infection of cut-down, umbilical stumps, ulcers & burns.
- Pseudomonas aeruginosa - most important cause of ~~burn~~ infections in burns.

(4) Write a short note on herpes simplex virus.

A HSV virus is a kind of enveloped virus with icosahedral core surrounded by a lipoprotein envelope with linear double-stranded DNA.

- * HSV large in size (120-200nm)
- * 2nd in size only to poxviruses.
- * Capsid surrounds DNA core & over the capsid is tegument.

⇒ Classification :

1. α -herpesvirinae : HSV-1, HSV-2, VZV
2. β -herpesvirinae : Cytomegalovirus, HHV-6, HHV-7
3. γ -herpesvirinae : EBV, HHV-8

There are 2 types of HSV :

1. HSV-1 : Usually isolated from lesions in and around the mouth and is transmitted by direct contact or droplet spread.

Eg: * Recurrent HSV of lips - herpes labialis

acute gingivostomatitis

recurrent herpes labialis

* Kaposi's varicella form eruption

2. HSV-2 :

Responsible for majority of genital herpes infections.

eg: herpes genitalis, neonatal herpes, aseptic meningitis.

⇒ Laboratory diagnosis :

1. Cell culture
2. Cytology
3. Direct fluorescent
4. PCR-based DNA detection
5. Serological methods

⇒ Treatment :

1. Supportive care & pain control
2. Definitive therapy: Acyclovir, famciclovir.
3. Idoxuridine used topically in eye & skin infection.

⑤ Write a short note on candida albicans?

A) C. Albicans is an opportunistic fungal pathogen that is responsible for candidiasis in human hosts.

⇒ Transmission :

C. albicans is usually transmitted from mother to infant through child birth and remains as part of a normal human's microflora.

⇒ Symptoms :

- * Patch of red, itchy skin, often leaking fluid
- * Scabs & pustules may be seen around the edge of rash.
- * Vaginal yeast infection results in slow leakage of thick, white, cheese-like substance.
- * Pain or discomfort during intercourse.

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Diagnosis:

- * Microscopy - Scraping or swab of affected area placed on micro slide. drop of 10% KOH is added to specimen, which dissolves skin cells, but leaves Candida cells intact.
- * Culture: on culture media, colonies are creamy, white, smooth & with a yeast odor.
- + Reynold's Braide phenomenon.

Very shorts

⑥ Media used in mycology?

- A) Niger seed agar - *Cryptococcus neoformans*
- Sabouraud's dextrose agar - dermatophytes
- Brain-heart infusion agar
- Potato dextrose agar
- Corn meal agar
- Water agar
- Czapek-Dox agar - *Aspergillus* sp.

⑦ Modes of transmission of hepatitis B infection?

- A) Transfusion of Carrier blood -
Needles, shared syringes, razors, acupuncture, tattooing.
- Congenital - Common for carrier mother, risk is high if mother is HBeAg (+ve)
- Sexual transmission - particularly in promiscuous homosexual.

⑧ Note on disposal of infectious waste

- A) Deep burial: materials after disinfection put in deep trenches, covered with lime & filled with soil.

Incineration: safe method for large solid infectious waste like anatomical waste, amputated limbs.

Autoclaving: Used in laboratories & clinics for disposal of infectious & sharp waste.

Microwave: Sterilization of small volume infectious waste.

Liquid waste: Pathological, chemical & toxic liquid waste should be treated with disinfectants.

⑨ Short note on coagulase test?

A) Tube-Coagulase test:

* Test detects free coagulase. 0.1 ml of young broth culture or agar culture suspension of isolate is added to 0.5 ml of human or rabbit plasma in narrow test tube.

* EDTA, oxalate or heparin may be used as anticoagulant for preparing the plasma.

Slide test:

* This detects bound coagulase & is much simpler & usually gives results parallel with the tube test.

* Prompt clumping of cocci indicates a positive test.

⑩ mention ④ bacteria causing meningitis?

A) Streptococcus pneumoniae - in infant, children & adults

Neisseria meningitidis - serotypes B & C occur commonly.

Haemophilus influenzae - unvaccinated patients

Mycobacterium tuberculosis

Treponema pallidum.


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