**Subject Dental Material instructor: Mr. Usman**

**Midterm Assignment 30 Marks**

**Department AHS Semester DT 4th *Name Shah Fahad IDI 14818***

* **Attempt all questions, all questions carry equal marks.**

***Q1***. ***Discuss glass ionomer cement briefly?***

***Answer No 1***

***Introduction***

Glass ionomer cement in tooth colored material introduced by Wilson and Kent . 1972. Material was based on reaction between silicate glass powder and polyacritic acid

***Classification***..

1. I. For luting
2. ii. For restoration
3. iii for linne and base
4. Iv. For feasure and sealent
5. V. Arthodontic cement

***Composition.***

These material may be supplied as powder and liquid or is powder mixed with liquid for clinicaal used

***Powder***

Silica 41.9/

Alumina. 28.6 /

Alumina fluoride .1.6/

Calcium flouride .15.7/

Sodium flouride .9.3/

***Liquid***.

Polyacrylic acid

Tortaric acid

Water

***Solubility and disintegration***

Initial solubility is high due to teaching of intermidiate product

. The complete sitting reaction takes place in 24 hours, cement should be protected from saliva durin this period

***Manipulation***.

1. Preparation of tooth surface
2. Proportion and mixing
3. Protection and cement during setting
4. Protection of cement after setting ***Protection of cement during setting.***

Glass inomer cement is extremly sensitive air and water during setting

***Protection of cement after setting .***

Before dismissing the patient restoration is again coated with protective agent to protect trimmed area.

***Advantages***

Inherent adhesion to the tooth surface .

. Good marginal seal .

.Anti cariogenic property

. Biocompatibility

***Disadvantages***.

Low fracture resistance

.low wear resistance

.water sensitive during setting phase

. Less esthetic compared to composite.

***Uses***.

Anterior estheti restoration material for class 3. And 5. Restoration

.For luting

.For core build up

.For eroded area.

For tooth filling

***Q2***. ***Differentiate permanent cement, luting agent and temporary cement.***

***Answer No 2***

 The differentiated between cement are as following..

1. ***Temporary cement***

 Temporary cement are used for short term. Temporary cements are used when the restoration will have to be removed. Most commonly, temporary cement is selected for the placement of provisional coverage.

1. ***Permanent cement***

 For the long term cementation of cast ‑ restorations such as inlays, crowns, bridges, laminate veneers, and orthodontic fixed appliances.

© ***Luting Agent's***

A material that acts as an adhesive to hold together the casting to the tooth structure. Luting agents are designed to be either permanent or temporary.

Q3. ***Write a detail note on manipulation, advantages and disadvantages of Zinc Oxide Eugenol cement.***

***Answer No 3***

***Manipulation***

 Powder/liquid ratio is 1.0 parts of powder to 1 part of liquid.

Using a small area of the pad surface.

Instrument should be cleaned before the cement sets on them.

***Advantage of zinc oxide and eugenol cement.***

 Inexpensive

Easy to manipulation

 Dimensional stability

Good surface detail

Can be added to with fresh zinc oxide eugenol

Non toxic

***Disadvantage of zinc oxide and eugenol cement.***

Cannot be used in very deep undercuts

Only sets quickly in thin section

Eugenol allergy in some patients

Q4***. Briefly explain polycarboxylate cement.***

Answer No 4

***Poly carboxylate cement.***

Zinc polycarboxylate cement was the first cement that was develop with property of adhesive bond the tooth structure along with same metallic restoration

***Availability***.

Zinc polycarboxylate cement is available as powder and liquid .

***Composition***.

Powder

. Zinc oxide 89/.

. Magnesium oxide 9/.

.barium oxide . o.2/.

Other oxide 1.4/.

***Liquid***.

. Polyacrylamide or 32 to 48/. Copolymer a acrylic acid

. Other carboxylic acid 30/. To 50/.

Such as it conic acid or metallic acid

***Properties of zinc Polycarboxylate***

. PH of liquid in zinc polycarboxylate \_ 1.7

.it is high bio compatible to the pulp which is similar to Zoë cement s

.setting time is 6 to 9 minutes

.working time is 25 minutes.

Solubility .0.6/.

***Uses of polycarboxylate***

Low irritancy

Adhesion to tooth

Easy manipulation

Strenth tensile

Solubility ( similar to zinc phosphate)

***Disadvantages***.

Poor esthetic

Solubility high.

***Advantage***

 Low irritancy

Adhesion to tooth

 Easy manipulation

 Strength tensile

Solubility (similar to zinc phosphate)

Film thickness (similar to zinc phospahate

***Q5***. ***Distinguish liquid powder ratio of Zinc phosphate cement, also write its uses and advantages***

***Zinc phosphate cement.***

***Liquid powder Ratio***

A range of mixing ratios occur for zinc phosphate cements in clinical usage and trials. The compressive strength of these cements is dependent on mixing ratio and at a critical ratio, a sudden rise in compressive strength is known to occur.

First normal ratio is 1.7 to 3.2 g/ml

When the mixing ratio of the zinc phosphate cement is increased from 2.3-2.4 g ml −1 , the number of powder agglomerates formed increases, leading to a higher strength. 19 Reducing the powder-liquid ratio of a zinc phosphate cement adversely affects its physical properties, such as retention.

 ***Uses***

Final cementation of cast metal restoration

Cavity base

Temporary filling material

Cementation of orthodontic bands

***Advantage***

Inconspicuous appearance

Speed and case of usage

Low thermal conductivity beneath a metallic restoration.