

NEET MDS Conservative Dentistry and Endodontics Sample Paper – 4

Duration: 25 Minutes

Maximum Marks: 100

Instructions

- This paper contains **25** Multiple Choice Questions (Single Correct Answer), modelled on the Conservative Dentistry and Endodontics portion of **NEET MDS** (NBEMS).
- Each correct answer carries **4 marks**. There is **negative marking of 1 mark** for each incorrect answer; unattempted questions are not penalised.
- Only **one** option is correct. Choose carefully.
- Syllabus level: **BDS-level Conservative Dentistry and Endodontics as per the NBEMS NEET MDS syllabus**.
- Use of mobile phones, calculators, or electronic gadgets is strictly prohibited.

Q1. The principal metallic component, by weight, of a conventional dental amalgam alloy powder is:

- (A) Copper
- (B) Tin
- (C) Zinc
- (D) Silver

Q2. In high-copper dental amalgams, the phase that is largely eliminated, thereby improving corrosion resistance and strength, is the:

- (A) Gamma phase (Ag_3Sn)
- (B) Gamma-1 phase (Ag_2Hg_3)
- (C) Gamma-2 phase (Sn_{7-8}Hg)



(D) Eta phase (Cu_6Sn_5)

Q3. Which property of dental amalgam is closely related to marginal breakdown (ditching) and is markedly reduced in high-copper alloys?

(A) Compressive strength

(B) Tarnish resistance

(C) Thermal conductivity

(D) Creep

Q4. After condensation and setting of a properly manipulated dental amalgam restoration, the residual mercury content should be approximately:

(A) 70–75%

(B) 10–15%

(C) 45–50%

(D) 80–85%

Q5. Delayed (secondary) expansion of a zinc-containing dental amalgam is chiefly caused by:

(A) Excess residual mercury

(B) Overtrituration of the mix

(C) Moisture (saliva) contamination during condensation

(D) Underfilling of the cavity

Q6. The process of mixing mercury with the alloy powder to produce a plastic, workable mass is termed:

(A) Trituration

(B) Condensation

(C) Carving

(D) Burnishing



- Q7.** During placement of dental amalgam, the principal objective of condensation is to:
- (A) Increase the residual mercury content
 - (B) Promote formation of the gamma-2 phase
 - (C) Soften the amalgam mix
 - (D) Adapt the amalgam to the cavity walls and express excess mercury, reducing voids
- Q8.** “Tarnish” of a dental amalgam restoration refers to:
- (A) Bulk fracture of the restoration
 - (B) Deep intergranular corrosion penetrating the mass
 - (C) A superficial surface discolouration or surface film
 - (D) Marginal ditching of the restoration
- Q9.** The powder of zinc phosphate cement is composed principally of:
- (A) Calcium hydroxide
 - (B) Zinc oxide (with a small amount of magnesium oxide)
 - (C) Alumino-silicate glass
 - (D) Polyacrylic acid
- Q10.** The liquid of zinc phosphate cement is essentially a buffered aqueous solution of:
- (A) Orthophosphoric acid
 - (B) Eugenol
 - (C) Polyacrylic acid
 - (D) Citric acid
- Q11.** Zinc phosphate cement is mixed slowly over a wide area of a cool glass slab primarily to:



- (A) Increase the setting rate
- (B) Raise the mix temperature
- (C) Reduce film thickness only
- (D) Dissipate the exothermic heat and allow maximum powder incorporation

Q12. The pH of freshly mixed zinc phosphate cement is markedly acidic, which is why a protective liner is advisable under it in deep cavities. The approximate initial pH is:

- (A) About 2
- (B) About 7
- (C) About 10
- (D) About 12

Q13. Zinc oxide eugenol (ZOE) is particularly valued as a temporary base because it:

- (A) Has very high compressive strength
- (B) Is obtundent (sedative) to the pulp owing to its near-neutral pH
- (C) Bonds chemically to enamel
- (D) Is highly translucent and aesthetic

Q14. Zinc oxide eugenol should NOT be used as a base directly beneath a resin composite restoration because:

- (A) It is far too strong for the composite
- (B) Residual eugenol interferes with (inhibits) polymerisation of the resin
- (C) It is completely radiolucent
- (D) It bonds too strongly to the composite

Q15. Zinc polycarboxylate cement is distinctive among the luting cements in that it:



- (A) Is fully translucent like glass
- (B) Sets by an acid-etch reaction with enamel
- (C) Bonds chemically (adhesively) to tooth structure through carboxyl groups reacting with calcium
- (D) Contains eugenol as its liquid

Q16. The liquid of zinc polycarboxylate cement is an aqueous solution of:

- (A) Orthophosphoric acid
- (B) Polyacrylic acid
- (C) Eugenol
- (D) Tannic acid

Q17. The primary indication for placing a calcium hydroxide liner on the deepest portion of a cavity is to:

- (A) Provide bulk mechanical support to the restoration
- (B) Stimulate reparative (tertiary) dentin and protect the pulp at a deep or nearly exposed site
- (C) Chemically bond a composite restoration
- (D) Etch the dentin before restoration

Q18. A cavity varnish (e.g., a copal-resin solution) applied under an amalgam restoration serves mainly to:

- (A) Provide thermal insulation as a bulk base
- (B) Chemically bond the amalgam to dentin
- (C) Release fluoride into the tooth
- (D) Reduce initial marginal microleakage by sealing the dentinal tubules

Q19. Which statement correctly distinguishes a cavity base from a liner?

- (A) A liner is always applied in a thicker layer than a base



- (B) A base is applied in bulk to provide thermal insulation and mechanical support beneath the restoration, whereas a liner is a thin protective coating
- (C) A varnish is the standard base placed under composite resin
- (D) A calcium hydroxide liner has very high compressive strength suitable as a bulk base

Q20. The Tofflemire retainer with a metal matrix band is used chiefly to provide a temporary wall and proper contact when restoring which class of amalgam cavity?

- (A) Class II
- (B) Class I
- (C) Class V
- (D) Simple pit-and-fissure sealant

Q21. The main purpose of placing a wooden or plastic wedge at the gingival embrasure during a Class II matrix procedure is to:

- (A) Polish the finished amalgam
- (B) Condition the dentin before restoration
- (C) Provide thermal insulation to the pulp
- (D) Adapt the matrix band to the gingival margin, prevent an overhang and separate the teeth

Q22. A sectional matrix used together with a separating (tensioning) ring is generally preferred over a full circumferential band because it:

- (A) Produces a tighter, more anatomically correct proximal contact
- (B) Is always cheaper than a Tofflemire band
- (C) Eliminates the need for any wedge
- (D) Removes the need for isolation of the field



- Q23.** The single most important advantage of rubber dam isolation during operative and endodontic procedures is:
- (A) Improved shade matching of restorations
 - (B) Faster setting of luting cements
 - (C) A dry, clean, moisture-controlled operating field with protection of the patient's airway and soft tissues
 - (D) Release of fluoride to the isolated teeth
- Q24.** Within the rubber dam assembly, the clamp (retainer) is placed primarily to:
- (A) Anchor and retain the rubber dam and retract the gingiva on the anchor tooth
 - (B) Etch the enamel of the anchor tooth
 - (C) Polish the isolated tooth surface
 - (D) Mix and carry the luting cement
- Q25.** For stable retention, the jaws (prongs) of a rubber dam clamp should ideally contact the anchor tooth at:
- (A) Four points on the cervical area, below the height of contour
 - (B) The occlusal surface only
 - (C) The incisal edge
 - (D) The exact middle of the crown, at the height of contour



Detailed Solutions**Q1.****Solution**

Concept — Amalgam alloy composition: A conventional (low-copper) amalgam alloy powder is predominantly silver (about 65–70%), with tin (about 25–29%), copper (about 6%) and a trace of zinc. Silver provides strength, corrosion resistance and setting expansion. **Why other options are wrong:** Tin is the second-largest fraction (lowers expansion but weakens the mass); copper and zinc are minor constituents. **Final Answer:** Major metal by weight $\Rightarrow$ Silver

Answer: (D) [Go Back to Q1](#)

Q2.**Solution**

Concept — High-copper amalgam: The tin–mercury gamma-2 phase (Sn_{7-8}Hg) is the weakest and most corrosion-prone phase. In high-copper alloys, copper reacts with tin to form the copper–tin eta phase instead, essentially eliminating gamma-2. **Why other options are wrong:** The gamma (Ag_3Sn) unreacted alloy and gamma-1 (Ag_2Hg_3) matrix are retained and are desirable; the eta phase is formed, not eliminated. **Final Answer:** Gamma-2 phase

Answer: (C) [Go Back to Q2](#)

Q3.**Solution**

Concept — Creep: Creep is the slow, time-dependent plastic deformation of set amalgam under load. High creep pushes amalgam beyond the cavity margin, leading to marginal breakdown (ditching). High-copper amalgams, lacking gamma-2, show much lower creep. **Why other options are wrong:** Compressive strength and tarnish resistance are improved (not the cause of ditching); amalgam has high thermal conductivity, but that relates to pulpal insulation, not marginal breakdown. **Final Answer:** Creep

Answer: (D) [Go Back to Q3](#)



Q4.

Solution

Concept — Residual mercury: Even after condensation removes excess mercury, the final set restoration retains roughly 45–50% mercury bound in the matrix phases. Keeping it in this range preserves strength and minimises creep. **Why other options are wrong:** 70–85% would indicate gross overfilling of mercury and a weak, high-creep restoration; 10–15% is far too low for a proper amalgamation reaction. **Final Answer:** 45–50%

Answer: (C) [Go Back to Q4](#)

Q5.

Solution

Concept — Delayed expansion: If a zinc-containing amalgam is contaminated by moisture during condensation, zinc reacts with water to liberate hydrogen gas. The gas accumulates over days to weeks, producing marked delayed expansion, pain and possible protrusion of the restoration. **Why other options are wrong:** Excess mercury and overtrituration alter strength but not this specific hydrogen-driven expansion; underfilling is a placement error unrelated to expansion. **Final Answer:** Moisture contamination

Answer: (C) [Go Back to Q5](#)

Q6.

Solution

Concept — Trituration: Trituration is the mechanical mixing of mercury with the alloy particles (in an amalgamator) to wet the particles and initiate the amalgamation reaction, producing a cohesive plastic mass. **Why other options are wrong:** Condensation packs the mix into the cavity; carving shapes the set restoration; burnishing smooths and adapts the surface. **Final Answer:** Trituration

Answer: (A) [Go Back to Q6](#)



Q7.

Solution

Concept — Condensation: Condensation compacts the triturated amalgam firmly against the cavity walls and matrix, minimising internal voids/porosity and forcing mercury-rich material to the surface so the excess can be removed. This maximises strength and density. **Why other options are wrong:** Good condensation reduces (not increases) residual mercury; it does not create gamma-2 or soften the mix.

Final Answer: Adapt to walls, remove excess mercury

Answer: (D) [Go Back to Q7](#)

Q8.

Solution

Concept — Tarnish: Tarnish is a superficial surface discolouration or thin surface film (often a sulphide) that dulls the amalgam but does not weaken it. It is distinct from corrosion, which is a deeper electrochemical degradation of the mass.

Why other options are wrong: Fracture and marginal ditching are mechanical failures; deep intergranular attack describes corrosion, not tarnish. **Final Answer:**

Surface discolouration/film

Answer: (C) [Go Back to Q8](#)

Q9.

Solution

Concept — Zinc phosphate powder: The powder is chiefly zinc oxide sintered with a few percent of magnesium oxide (which controls the reaction rate); small amounts of pigments and silica may be added. **Why other options are wrong:**

Calcium hydroxide, alumino-silicate glass (glass-ionomer) and polyacrylic acid belong to other cement systems. **Final Answer:**

Zinc oxide (+ MgO)

Answer: (B) [Go Back to Q9](#)

Q10.

Solution

Concept — Zinc phosphate liquid: The liquid is an aqueous solution of orthophosphoric acid buffered with aluminium and zinc salts. Reaction of the acid with zinc oxide forms a zinc phosphate matrix (a mainly acid-base cement). **Why other options are wrong:** Eugenol is the ZOE liquid; polyacrylic acid is the



polycarboxylate/glass-ionomer liquid; citric acid is not the setting liquid here. **Final Answer:** Orthophosphoric acid

Answer: (A) [Go Back to Q10](#)

Q11.

Solution

Concept — Cool-slab mixing: The acid–base setting reaction is strongly exothermic. Spreading the mix over a large area of a cool glass slab dissipates heat and slows the reaction, allowing more powder to be incorporated before setting, giving a stronger, less acidic, lower-solubility cement. **Why other options are wrong:** It deliberately slows setting, not speeds it; it does not aim to raise temperature, and film thickness is a separate consideration. **Final Answer:** Dissipate heat, add more powder

Answer: (D) [Go Back to Q11](#)

Q12.

Solution

Concept — Initial acidity: Freshly mixed zinc phosphate cement has a pH near 2 and remains acidic for the first day or so before neutralising. This low pH can irritate the pulp, so a liner/base is recommended in deep preparations. **Why other options are wrong:** A neutral (7) or alkaline (10–12) pH would not be irritating; those values do not represent freshly mixed zinc phosphate. **Final Answer:** About pH 2

Answer: (A) [Go Back to Q12](#)

Q13.

Solution

Concept — ZOE: Set ZOE has a nearly neutral pH and eugenol has a mild obtundent (soothing) effect on the pulp, making it a valuable sedative temporary base and provisional cement. **Why other options are wrong:** ZOE is weak in compression, does not bond to enamel, and is opaque, not aesthetic. **Final Answer:** Obtundent to the pulp

Answer: (B) [Go Back to Q13](#)



Q14.

Solution

Concept — Eugenol and resin: Free eugenol is a radical scavenger that inhibits the addition polymerisation of methacrylate resins. ZOE beneath a composite leaves a soft, incompletely cured resin layer, so a non-eugenol base is used instead. **Why other options are wrong:** ZOE is too weak, not too strong; it is radiopaque enough to detect and does not bond to composite. **Final Answer:**

Eugenol inhibits resin cure

Answer: (B) [Go Back to Q14](#)

Q15.

Solution

Concept — Polycarboxylate adhesion: Zinc polycarboxylate was the first cement to bond chemically to tooth structure: carboxyl ($-\text{COOH}$) groups of polyacrylic acid chelate calcium ions in enamel and dentin, giving true adhesion with good pulpal biocompatibility. **Why other options are wrong:** It is opaque, does not set by etching, and contains no eugenol. **Final Answer:**

Chemical bond to tooth

Answer: (C) [Go Back to Q15](#)

Q16.

Solution

Concept — Polycarboxylate liquid: The liquid is a viscous aqueous solution of polyacrylic acid (or a copolymer). Its long chains supply the carboxyl groups that both set the cement with zinc oxide and bond to calcium in tooth structure. **Why other options are wrong:** Orthophosphoric acid is the zinc phosphate liquid; eugenol is the ZOE liquid; tannic acid is not used. **Final Answer:**

Polyacrylic acid

Answer: (B) [Go Back to Q16](#)

Q17.

Solution

Concept — Calcium hydroxide liner: A thin calcium hydroxide liner placed on the deepest floor of a cavity (near or over a small exposure) stimulates odontoblasts to lay down reparative/tertiary dentin and, through its high pH, protects and disinfects the pulp. **Why other options are wrong:** It is too weak to give bulk support, does not bond composite, and is not an etchant. **Final Answer:**



Stimulate tertiary dentin, protect pulp

Answer: (B) [Go Back to Q17](#)

Q18.

Solution

Concept — Cavity varnish: A copal-resin varnish forms a thin film that seals dentinal tubules and reduces early marginal microleakage under an amalgam, limiting postoperative sensitivity until corrosion products self-seal the interface.

Why other options are wrong: Its film is far too thin for thermal insulation; it does not bond amalgam or release fluoride, and it is not used under composite (it interferes with bonding). **Final Answer:** Reduce marginal microleakage

Answer: (D) [Go Back to Q18](#)

Q19.

Solution

Concept — Liner vs base: A liner is a thin coating (a few tenths of a millimetre) protecting the pulp and sealing dentin; a base is placed in greater bulk to provide thermal insulation and mechanical support beneath the definitive restoration. **Why other options are wrong:** A liner is thinner, not thicker, than a base; varnish is not used under composite; calcium hydroxide liner is weak, not a load-bearing base.

Final Answer: Base = bulk support/insulation

Answer: (B) [Go Back to Q19](#)

Q20.

Solution

Concept — Tofflemire matrix: The Tofflemire (circumferential) retainer holds a metal band that restores the missing proximal wall of a Class II (proximo-occlusal) cavity, allowing condensation of amalgam and re-establishment of contour and contact. **Why other options are wrong:** A Class I cavity has intact walls needing no matrix; Class V and sealants do not require a proximal matrix band.

Final Answer: Class II

Answer: (A) [Go Back to Q20](#)



Q21.

Solution

Concept — Wedge function: The wedge, placed from the embrasure at the gingival margin, presses the matrix band tightly against the cervical cavosurface to prevent an amalgam overhang, and its wedging action provides slight tooth separation to compensate for band thickness and secure a good contact. **Why other**

options are wrong: It does not polish, condition dentin, or insulate the pulp.

Final Answer: Adapt band, prevent overhang, separate

Answer: (D) [Go Back to Q21](#)

Q22.

Solution

Concept — Sectional matrix + ring: A pre-contoured sectional matrix combined with a nickel-titanium separating ring produces a tight, anatomically shaped proximal contact and correct marginal ridge, which is often difficult to achieve with a flat circumferential band. **Why other options are wrong:** Cost is not

the reason; a wedge is still needed; isolation remains necessary. **Final Answer:**

Tighter, anatomic contact

Answer: (A) [Go Back to Q22](#)

Q23.

Solution

Concept — Rubber dam: The chief benefit of the rubber dam is a dry, clean, isolated operating field free of saliva, tongue and cheek, which improves the quality of moisture-sensitive procedures while protecting the airway and soft tissues from instruments and irrigants. **Why other options are wrong:** It does not af-

fect shade matching or cement setting rate and does not release fluoride. **Final**

Answer: Dry, protected operating field

Answer: (C) [Go Back to Q23](#)



Q24.

Solution

Concept — Rubber dam clamp: The clamp (retainer) engages the anchor (most posterior) tooth to hold the rubber dam in place and, by its jaws, retracts the gingiva and stabilises the dam during the procedure. **Why other options are**

wrong: The clamp does not etch, polish, or mix/carry cement. **Final Answer:**
Anchor dam, retract gingiva

Answer: (A) [Go Back to Q24](#)

Q25.

Solution

Concept — Clamp four-point contact: For stability, the four prongs of the clamp should engage the tooth at four points on the cervical area, gingival to the height of contour. This seats the clamp securely without rocking and avoids occlusal or supragingival slippage. **Why other options are wrong:** Contact at the occlusal surface, incisal edge, or at the height of contour would let the clamp slip off or rock. **Final Answer:** Four cervical points below the bulge

Answer: (A) [Go Back to Q25](#)



Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	D	2	C	3	D	4	C	5	C
6	A	7	D	8	C	9	B	10	A
11	D	12	A	13	B	14	B	15	C
16	B	17	B	18	D	19	B	20	A
21	D	22	A	23	C	24	A	25	A

