

NEET MDS Conservative Dentistry and Endodontics Sample Paper – 7

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. In passive ultrasonic irrigation (PUI), the improved cleaning of the canal is produced mainly by:

- (A) Continuous mechanical filing of the dentinal walls by the tip
- (B) The heat generated melting residual gutta-percha
- (C) Acoustic streaming and cavitation of the irrigant around a freely oscillating file
- (D) Simple pressure injection of irrigant to the apex

Q2. The term “passive” in passive ultrasonic irrigation refers to the fact that the oscillating instrument should ideally:

- (A) Be used at low rotational torque
- (B) Not touch or actively cut the canal walls during activation



- (C) Remain switched off between pulses
- (D) Be pre-bent to the canal curvature

Q3. The EndoActivator system activates irrigant within the canal using:

- (A) A rotating nickel-titanium file
- (B) Piezoelectric ultrasonic energy
- (C) A continuous negative-pressure cannula at the apex
- (D) A sonically driven flexible polymer tip

Q4. The EndoVac apical negative-pressure system reduces the risk of a hypochlorite extrusion accident chiefly because:

- (A) It uses only sterile saline instead of NaOCl
- (B) Irrigant is aspirated coronally so fluid is pulled down the canal rather than pushed past the apex
- (C) The micro-cannula physically blocks the apical foramen
- (D) It never allows irrigant to reach working length

Q5. Laser-activated irrigation (including the photon-induced photoacoustic streaming, PIPS, technique) enhances irrigant action by:

- (A) Directly lasing and vaporising the canal walls to working length
- (B) Chemically converting NaOCl into chlorine dioxide
- (C) Raising irrigant temperature above 100 °C throughout the canal
- (D) Creating photoacoustic shock waves and cavitation bubbles that agitate the irrigant

Q6. Compared with 2% sodium hypochlorite, a key limitation of chlorhexidine (CHX) as a sole root-canal irrigant is that it:

- (A) Has no antibacterial activity
- (B) Stains the dentin permanently green



- (C) Cannot dissolve organic pulp tissue or the necrotic/biofilm matrix
- (D) Is far more cytotoxic than NaOCl

Q7. The property that makes 2% chlorhexidine attractive as a final irrigant—its ability to adsorb to dentin and be released over time to give prolonged antibacterial action—is termed:

- (A) Chelation
- (B) Substantivity
- (C) Saponification
- (D) Buffering capacity

Q8. MTAD, promoted as a final rinse, is a mixture of:

- (A) Sodium hypochlorite, hydrogen peroxide and saline
- (B) Chlorhexidine and calcium hydroxide
- (C) A tetracycline isomer (doxycycline), citric acid and a detergent (Tween-80)
- (D) EDTA, iodine and potassium nitrate

Q9. QMix is a combination final-rinse solution whose components are:

- (A) NaOCl plus EDTA
- (B) EDTA, chlorhexidine and a surfactant (detergent)
- (C) Citric acid plus doxycycline
- (D) Iodine potassium iodide plus saline

Q10. In the widely recommended final-rinse sequence for smear-layer management, EDTA is used first and is then followed by a final flush of:

- (A) More 17% EDTA to deepen demineralisation
- (B) Distilled water only, to avoid any interaction
- (C) Sodium hypochlorite, to remove the organic component of the smear layer exposed by EDTA



(D) Phosphoric acid gel

Q11. Prolonged or high-concentration EDTA contact with the canal wall is undesirable because it can:

- (A) Raise the dentin pH to 12
- (B) Coagulate residual pulp tissue
- (C) Precipitate a brown para-chloroaniline layer
- (D) Cause excessive peritubular and intertubular dentin erosion, weakening the dentin

Q12. A root-canal biofilm is best defined as:

- (A) A structured community of microorganisms embedded in a self-produced extracellular polymeric matrix adherent to the canal wall
- (B) A single planktonic species floating freely in the irrigant
- (C) The inorganic smear layer produced by filing
- (D) A sterile layer of denatured collagen

Q13. Bacteria organised within a biofilm are clinically important in endodontics mainly because they:

- (A) Are markedly more resistant to antimicrobials than their planktonic counterparts
- (B) Cannot survive once the pulp is removed
- (C) Are always strict aerobes
- (D) Are destroyed instantly by a single pass of any irrigant

Q14. Triple antibiotic paste (TAP), used as an intracanal medicament chiefly in regenerative endodontics, classically combines:

- (A) Amoxicillin, erythromycin and gentamicin
- (B) Penicillin, tetracycline and vancomycin



- (C) Metronidazole, ciprofloxacin and minocycline
- (D) Clindamycin, azithromycin and doxycycline

Q15. A recognised drawback of using minocycline in triple antibiotic paste for regenerative procedures is:

- (A) It has no antibacterial effect
- (B) It dissolves gutta-percha
- (C) It raises canal pH excessively
- (D) Crown/coronal tooth discolouration (staining)

Q16. “Double antibiotic paste” is often preferred over the triple paste in regenerative endodontics because it:

- (A) Omits minocycline to reduce tooth discolouration while retaining metronidazole and ciprofloxacin
- (B) Contains only calcium hydroxide and iodine
- (C) Adds a fourth antibiotic for broader cover
- (D) Is a form of sodium hypochlorite gel

Q17. Chlorhexidine *gel* (rather than the liquid) is sometimes chosen as an intracanal medicament because it:

- (A) Dissolves the smear layer
- (B) Sets to a hard barrier like MTA
- (C) Neutralises residual NaOCl chemically
- (D) Stays in contact with the canal wall longer, giving sustained (substantive) antibacterial action

Q18. When sodium hypochlorite and chlorhexidine are used in direct succession without an intermediate rinse, they interact to form:

- (A) An orange-brown precipitate containing para-chloroaniline (PCA)



- (B) A harmless clear solution of increased potency
- (C) Calcium silicate hydrate
- (D) Free chlorine gas only, with no precipitate

Q19. The main clinical concern about the NaOCl–CHX precipitate (para-chloroaniline) is that it:

- (A) Improves the apical seal
- (B) Increases chlorhexidine substantivity
- (C) Is potentially cytotoxic/carcinogenic and can occlude dentinal tubules, hindering the seal
- (D) Whitens the tooth permanently

Q20. To avoid the NaOCl–CHX precipitate when a CHX final rinse is planned, the recommended intermediate step between the two solutions is:

- (A) An intervening flush with EDTA and/or sterile water (saline) to remove residual NaOCl before CHX
- (B) Immediately drying the canal with paper points only
- (C) Placing calcium hydroxide first
- (D) Increasing the NaOCl concentration

Q21. A “hypochlorite accident” (sodium hypochlorite extrusion beyond the apex) classically presents with:

- (A) Immediate severe pain, rapid diffuse swelling, bleeding/ecchymosis and a burning sensation
- (B) Painless gradual swelling appearing after several days
- (C) An immediate green discolouration of the crown only
- (D) No symptoms because NaOCl is inert in tissue

Q22. The immediate, appropriate first-line management of a hypochlorite extrusion accident is to:



- (A) Continue irrigating vigorously to flush the tissue clean
- (B) Reassure the patient, stop irrigation, and control pain and swelling (cold compress initially, then warm), with analgesics and follow-up
- (C) Immediately extract the tooth
- (D) Inject more NaOCl to dilute the first amount

Q23. Which factor most effectively increases the tissue-dissolving and antibacterial efficacy of a sodium hypochlorite irrigant?

- (A) Raising the solution temperature and frequently renewing (refreshing) the irrigant with agitation
- (B) Cooling the solution below room temperature
- (C) Leaving the same aliquot static in the canal for the whole appointment
- (D) Buffering it to a neutral pH

Q24. A practical safety measure that specifically reduces the chance of apical irrigant extrusion during positive-pressure syringe irrigation is:

- (A) Wedging the needle firmly at working length
- (B) Using the highest possible plunger force
- (C) Sealing the orifice with the needle hub
- (D) Using a side-vented needle kept 1–3 mm short of working length with gentle, non-binding delivery

Q25. Chlorhexidine is generally regarded as a substitute or adjunct final irrigant—especially in cases of non-vital, previously treated canals—mainly because of its:

- (A) Ability to dissolve the inorganic smear layer
- (B) Effectiveness (including substantivity) against organisms such as those resistant to calcium hydroxide, with low tissue toxicity
- (C) Capacity to bleach discoloured dentin



(D) Setting into a solid apical plug



Detailed Solutions

Q1.

Solution

Concept — Passive ultrasonic irrigation: A freely oscillating ultrasonic file transmits energy to the irrigant, producing *acoustic streaming* (rapid fluid movement) and *cavitation* (formation and collapse of micro-bubbles). These physical effects disrupt biofilm and drive irrigant into isthmuses and lateral spaces.

Why other options are wrong: The file should not cut the walls; heat/melting and simple pressure injection are not the mechanism of PUI. **Final Answer:**

Acoustic streaming and cavitation

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

Q2.

Solution

Concept — Meaning of “passive”: In PUI the instrument is left to oscillate *freely* in a canal already shaped; it should not bind or actively plane the walls, so that maximal energy is delivered to the irrigant rather than to dentin removal. **Why**

other options are wrong: It is an ultrasonic (not torque-limited rotary) instrument, it is activated (not switched off), and pre-bending is not what “passive” denotes. **Final Answer:**

File does not touch/cut the walls

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

Q3.

Solution

Concept — EndoActivator: It is a *sonic* device that vibrates a flexible, non-cutting polymer tip at sonic frequencies to agitate the irrigant vigorously within the canal.

Why other options are wrong: It is not a rotary file or a piezoelectric ultrasonic unit; apical negative pressure describes the EndoVac, not the EndoActivator. **Final Answer:**

Sonically driven polymer tip

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



Q4.

Solution

Concept — Apical negative pressure: In the EndoVac system irrigant is delivered coronally and *suctioned* from the apical region through a micro-cannula. Because fluid is pulled apically-to-coronally rather than pushed toward the foramen, the danger of extruding NaOCl beyond the apex is greatly reduced while irrigant still reaches working length. **Why other options are wrong:** NaOCl is still used; the cannula does not plug the foramen; irrigant does reach working length—that is its advantage. **Final Answer:** Fluid is aspirated, not pushed past the apex

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

Q5.

Solution

Concept — Laser-activated irrigation: Pulsed erbium lasers (e.g. Er:YAG in the PIPS protocol) deposit energy in the irrigant, generating expanding and collapsing vapour bubbles and *photoacoustic shock waves* that agitate the fluid three-dimensionally without needing to lase the walls directly. **Why other options are wrong:** The tip stays in the reservoir/coronal canal (it does not vaporise walls to length); there is no conversion to chlorine dioxide; bulk boiling of the whole canal does not occur. **Final Answer:** Photoacoustic shock waves / cavitation

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

Q6.

Solution

Concept — Chlorhexidine limitation: CHX is an excellent, substantive antibacterial but it *cannot dissolve organic tissue*. It has no proteolytic/saponifying action on necrotic pulp remnants or the organic biofilm matrix, so it cannot replace NaOCl during shaping. **Why other options are wrong:** CHX is strongly antibacterial, does not permanently stain green, and is actually *less* cytotoxic than NaOCl. **Final Answer:** Cannot dissolve organic tissue

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



Q7.

Solution

Concept — Substantivity: Cationic chlorhexidine binds to negatively charged dentin/hydroxyapatite and is slowly released, maintaining an antibacterial reservoir for days to weeks—this residual, sustained activity is called *substantivity*.

Why other options are wrong: Chelation is the EDTA property; saponification is NaOCl's fat-splitting reaction; buffering capacity is unrelated. **Final Answer:**

Substantivity

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

Q8.

Solution

Concept — MTAD: MTAD (a Mixture of a Tetracycline isomer, an Acid and a Detergent) contains *doxycycline*, *citric acid* and the surfactant *Tween-80*. It removes the smear layer while providing antibacterial (and substantive) action, and is used as a final rinse after NaOCl.

Why other options are wrong: The other combinations describe unrelated or fictitious mixtures. **Final Answer:**

Doxycycline + citric acid + detergent

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

Q9.

Solution

Concept — QMix: QMix is a ready-mixed final irrigant combining *EDTA* (smear-layer removal), *chlorhexidine* (antibacterial/substantive) and a *surfactant* to improve wetting. It removes the smear layer and kills residual bacteria in one step.

Why other options are wrong: It contains neither NaOCl, citric acid/doxycycline, nor iodine. **Final Answer:**

EDTA + CHX + surfactant

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

Q10.

Solution

Concept — Final-rinse sequence: EDTA removes the *inorganic* portion of the smear layer, exposing the underlying *organic* debris/collagen; a brief final flush of *NaOCl* then dissolves that organic remnant, leaving tubules clean. (A very short NaOCl flush is used to limit dentin erosion.) **Why other options are wrong:** Re-



peating EDTA over-erodes dentin; water/phosphoric acid do not complete organic removal in this protocol. **Final Answer:** Follow EDTA with a NaOCl flush

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

Q11.

Solution

Concept — EDTA over-exposure: Because EDTA chelates calcium, prolonged or concentrated contact demineralises and *erodes* peritubular and intertubular dentin, reducing microhardness and potentially weakening the root—hence EDTA is limited to about a 1-minute application. **Why other options are wrong:** EDTA does not raise pH to 12 (that is $\text{Ca}(\text{OH})_2$), does not coagulate tissue, and does not create the PCA precipitate (that is the NaOCl-CHX interaction). **Final Answer:** Excessive dentin erosion

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

Q12.

Solution

Concept — Biofilm definition: A biofilm is a *structured, matrix-embedded community* of microorganisms adherent to a surface, held together by self-produced extracellular polymeric substances (EPS). In the canal it lines dentinal walls and tubules. **Why other options are wrong:** It is neither a single planktonic species, the inorganic smear layer, nor a sterile collagen layer. **Final Answer:** Matrix-embedded microbial community

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

Q13.

Solution

Concept — Biofilm resistance: Organisms in a biofilm can be hundreds of times more *tolerant* of antimicrobials than free (planktonic) cells—owing to the protective EPS matrix, reduced penetration, altered microenvironment and slow-growing persister cells—so mechanical/physical disruption plus fresh irrigant is essential. **Why other options are wrong:** Biofilm bacteria persist after pulp removal, include facultative anaerobes, and are not instantly killed by a single irrigant pass. **Final Answer:** More resistant than planktonic bacteria



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

Q14.

Solution

Concept — Triple antibiotic paste: The classic Hoshino/regenerative TAP combines *metronidazole*, *ciprofloxacin* and *minocycline* to broadly disinfect the canal system before revascularisation. **Why other options are wrong:**

The other trios are not the recognised TAP formulation. **Final Answer:**

Metronidazole + ciprofloxacin + minocycline

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

Q15.

Solution

Concept — Minocycline staining: Minocycline chelates and binds within dentin, producing grey/brown *crown discolouration*—a well-recognised esthetic drawback of TAP in regenerative endodontics. **Why other options are wrong:** Minocycline is antibacterial, does not dissolve gutta-percha, and does not raise canal pH excessively. **Final Answer:**

Coronal tooth discolouration

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

Q16.

Solution

Concept — Double antibiotic paste: To avoid the staining caused by minocycline, the *double* paste omits it and retains *metronidazole* + *ciprofloxacin*, preserving antibacterial cover while reducing discolouration (some clinicians substitute cefaclor for minocycline for the same reason). **Why other options are wrong:**

DAP is not calcium hydroxide/iodine, does not add a fourth drug, and is not a NaOCl gel. **Final Answer:**

Metronidazole + ciprofloxacin (no minocycline)

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



Q17.

Solution

Concept — Chlorhexidine gel medicament: The gel vehicle keeps CHX in prolonged contact with the canal wall, exploiting its *substantivity* to give sustained antibacterial action between visits—useful against organisms tolerant to calcium hydroxide. **Why other options are wrong:** CHX does not dissolve the smear layer, does not set hard like MTA, and is not used chemically to neutralise NaOCl. **Final Answer:** Prolonged, substantive contact

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

Q18.

Solution

Concept — NaOCl + CHX interaction: Mixing NaOCl with CHX produces an insoluble *orange-brown precipitate* that contains *para-chloroaniline* (PCA), an aromatic amine. **Why other options are wrong:** The reaction is not harmless or clarifying, does not form calcium silicate hydrate, and yields a visible precipitate (not merely gas). **Final Answer:** Para-chloroaniline precipitate

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

Q19.

Solution

Concept — Significance of PCA: Para-chloroaniline is regarded as potentially *cytotoxic and carcinogenic*; the precipitate also occludes dentinal tubules and can compromise the seal and dye/bacterial penetration, so the interaction should be avoided. **Why other options are wrong:** It does not improve the seal, does not raise CHX substantivity, and does not whiten the tooth. **Final Answer:** Cytotoxic PCA that occludes tubules

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

Q20.

Solution

Concept — Preventing the precipitate: An *intermediate flush*—EDTA and/or sterile water/saline—removes residual NaOCl from the canal before CHX is introduced, preventing the two from meeting and forming PCA. **Why other options are wrong:** Paper-point drying alone leaves residual NaOCl in tubules;



Ca(OH)₂ first or stronger NaOCl does not address the interaction. **Final Answer:** Intervening EDTA/saline rinse

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

Q21.

Solution

Concept — Hypochlorite accident: Extrusion of NaOCl through the apex causes an immediate, dramatic reaction: sudden severe pain, a burning sensation, rapid diffuse soft-tissue swelling, and bleeding/ecchymosis (bruising) from tissue and vascular injury. **Why other options are wrong:** Onset is immediate (not delayed or painless); it is not merely a crown colour change; NaOCl is highly reactive, not inert, in tissue. **Final Answer:** Immediate pain, swelling and ecchymosis

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

Q22.

Solution

Concept — Managing the accident: Management is largely supportive: stop irrigation immediately, reassure the patient, and control pain and swelling—an initial *cold* compress to limit swelling followed later by *warm* compresses to aid resolution, plus analgesics ($\pm$ antibiotics/steroids) and close follow-up. **Why other options are wrong:** One must not keep irrigating, extract the tooth, or add more NaOCl. **Final Answer:** Stop, reassure, control pain/swelling

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

Q23.

Solution

Concept — Boosting NaOCl efficacy: *Heating* sodium hypochlorite and *frequently refreshing* it (with agitation/activation) markedly increases its tissue-dissolving and antibacterial power by speeding the reaction and maintaining available free chlorine at the wall. **Why other options are wrong:** Cooling slows the reaction; leaving a static aliquot exhausts the free chlorine; neutral buffering reduces activity. **Final Answer:** Warm it and refresh/agitate frequently

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



Q24.

Solution

Concept — Safe syringe irrigation: Using a *side-vented* (closed-ended) needle, kept about 1–3 mm short of working length, moved gently so it never binds, and delivered with slow low pressure, directs flow coronally and minimises apical extrusion. **Why other options are wrong:** Wedging at length, high plunger force, or sealing the orifice all raise apical pressure and the risk of a hypochlorite accident.

Final Answer: Side-vented needle short of length, gentle flow

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

Q25.

Solution

Concept — CHX as adjunct final irrigant: In retreatment and non-vital cases, CHX is valued for its broad antibacterial spectrum, notable *substantivity*, and effectiveness against calcium-hydroxide-tolerant organisms, all with comparatively low tissue toxicity—making it a useful final rinse or medicament adjunct.

Why other options are wrong: CHX does not remove the inorganic smear layer, does not bleach dentin, and does not set into a plug. **Final Answer:**

Substantive, low-toxicity antibacterial

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



Answer Key

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

