TRANSFORMERS AND ALTERNATORS

BRANCH :- EE / EEE

These Questions are made for your previous exam, from PYQ and some internet….(Notes reference le Lena ek baar)

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🎯 *Based on 2024 PYQ + Exam Pattern + Practical Logic*

🔷 Unit 1: AC Fundamentals *(Only Basics – as per PYQ)*

1. Define inductive reactance, capacitive reactance, and impedance. ✅
2. Explain the concept of time constant in RL circuit. ✅
3. Phasor diagram for RLC series circuit. ✅
4. Define power factor and its significance. *(Expected)*

🔷 Unit 2: Transformer – Basics

5. Define transformer and its working principle. ✅
6. Core-type vs Shell-type transformer. ✅
7. Types/classification of transformers. *(Expected)*

🔷 Unit 3: Transformer – Performance

8. ⭐ **Derive EMF equation of transformer.** 🧠 ✅
9. ⭐ **Derive efficiency and all-day efficiency formula.** 🧠 ✅
10. Define voltage regulation with significance. ✅
11. Tap-changer: function and location near neutral. ✅
12. Explain leakage flux and factors affecting it. ✅
13. Pure resistive load — power factor at primary side. *(Expected)*

🔷 Unit 4: Transformer – Testing & Operation

14. OC & SC test with diagrams and explanation. ✅
15. Conditions for parallel operation of transformer. ✅
16. Auto-transformer vs Two-winding transformer. ✅
17. Star–Delta & Delta–Delta connections with relation. *(Expected)*

Unit 5: Alternator – Construction & Performance

18. Salient vs Non-salient pole construction. ✅
19. ⭐ **Derive EMF equation of alternator.** 🧠 *(Expected)*
20. Armature reaction – effect on voltage. ✅

Unit 6: Alternator – Test & Synchronizing

21. OC and SC test on alternator – purpose and use. ✅
22. Regulation using EMF method. *(Numerical expected)*
23. Conditions for parallel operation of alternators. *(Expected)*
24. Synchronization methods – Lamp & Synchroscope. ✅
25. Hunting – causes and how to prevent. ✅
26. Cooling methods – hydrogen-based. ✅

Unit 7: Windings & Safety

27. Define & explain distribution factor and pitch factor. ✅
28. Calculate Kd and Kp for given data. *(Numerical expected)*
29. Safety practices while working with transformers/alternators. ✅