

**Department of Electrical Engineering, NIT Hamirpur**

**M.tech First Year End Semester Exam (Specialization: Condition Monitoring of Power Apparatus)**

**Subject: Transformer Engineering and Practices (EE-651)**

**Instructions to students:**

1. All questions are compulsory. Each question carries 05 marks.
2. Answer sheet must be in a sequence and uploaded in form of pdf. The answer sheet need to be saved in the format rollnoEE651.pdf.
3. Submit the paper in 15 minutes of paper completion time
4. Name, roll no., subject name and subject code must be mentioned at the top of paper. In the bottom of answer sheet students must put their sign with date of exam. Once submitted answer sheet should not be modified again.

**Questions:**

Q1.	Describe the characteristics of Pressboard and its significance.	[05]
Q2.	Explain the transient voltage distribution along the winding under switching surges.	[05]
Q3.	Derive the optimum location of oil ducts in the core section using suitable criterion.	[05]
Q4.	Explain the different considerations required regarding the design of composite dielectric insulation system.	[05]
Q5.	Describe different types of on-load tapchangers with neat diagram.	[05]
Q6.	Explain the failure of winding due to radial and axial forces. How these failures can be eliminated?	[05]
Q7.	Describe different type of cooling methods used in transformers with its application.	[05]
Q8.	Draw a schematic diagram of temperature indicator and explain its construction and operating principle.	[05]
Q9.	Explain different type of core configuration for single phase and three phase transformer with a neat diagram.	[05]
Q10.	<p>A 575 kVA, 7500/435V, 50Hz, single phase core type transformer has following data: Width of h.v winding= 27mm, width of l.v winding =23mm, width of duct= 15mm, height of coils= 0.35m, length of mean turn =1.25m, number of turns in h.v. winding =190, per unit impedance =0.036, doubling effect multiplier=1.8</p> <p>(a) Find the instantaneous radial force on h.v. winding under short circuit conditions if the height of h.v. and l.v. winding is equal. (b) Find the instantaneous axial force on h.v. winding under short circuit conditions if h.v. winding is 5% shorter than l.V. winding at one end.</p>	[05]