

## Department of Electrical Engineering

**BEEG-1001**

**Session:2021-22**

**Tutorial sheet: 3**

**Basic Electrical Engineering**

**Even Semester**

**Module II**

1. The open-circuit voltage of a transformer is 240V. A tap-changing device is set to operate when the percentage regulation drops below 2.5%. Determine the load voltage at which the mechanism operates.

Ans: 234V

2. A 200 kVA rated transformer has a full load copper loss of 1.5kW and an iron loss of 1kW. Determine the transformer efficiency (a) at full load and 0.85 power factor (b) at half full load and 0.85 power factor.

Ans: 98.55%, 98.41%

3. A 500 kVA transformer has a full load copper loss of 4kW and an iron loss of 2.5kW. Determine (a) the output kVA at which the efficiency of the transformer is a maximum, and (b) the maximum efficiency, assuming the power factor of the load is 0.75.

Ans: 395.5KVA, 98.34%

4. The following results were obtained on a 50KVA, 2400/120V single-phase transformer:

Open circuit test: 396W, 9.65A, 120V on low voltage side. Determine the circuit constants.

Ans:  $I_w=3.3$  A,  $I_m=9.06$  A,  $R_w=36.3$  ohm,  $x_m=13.2$  ohm

5. The following results were obtained on a 50KVA, 2400/120V single-phase transformer:

short circuit test: 810W, 20.8A, 92V on HV side. Determine the efficiency of transformer at full load and 0.8 lagging power factor. Assume the core loss is 396W.

Ans: 97.0%