## Unit-5

| S.No | Questions | BT | CO | PO |
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| Part -A (Short Answer Questions) | | | | |
| 1. | State the conditions required for the parallel operation of two single-phase transformers. | BT1 | CO5 | PO1 |
| 2. | What is meant by equal voltage ratio in parallel operation of transformers? | BT1 | CO5 | PO1 |
| 3. | What is the effect of unequal voltage ratios when transformers operate in parallel? | BT1 | CO5 | PO1 |
| 4. | Define an autotransformer. | BT1 | CO5 | PO1 |
| 5. | State one advantage of an autotransformer over a two-winding transformer. | BT1 | CO5 | PO1 |
| 6. | What is the transformation ratio of an autotransformer? | BT1 | CO5 | PO1 |
| 7. | Draw or name the equivalent circuit of an autotransformer. | BT1 | CO5 | PO1 |
| 8. | Mention one application of an autotransformer. | BT1 | CO5 | PO1 |
| 9. | Name the four standard three-phase transformer connections. | BT1 | CO5 | PO1 |
| 10. | Which transformer connection is commonly used for stepping down voltage in distribution systems? | BT1 | CO5 | PO1 |

| S.No | Questions | BT | CO | PO |
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| | Part -B (Long Answer Questions) | | | |
| 1. | Write the conditions required for the parallel operation of two single phase transformers. | BT3 | CO5 | PO3 |
| 2. | Draw the connection diagrams and explain the features of Y-Y, Y-Δ, Δ-Y and Δ-Δ three-phase connections | BT3 | CO5 | PO3 |
| 3. | A 400/100 V, 5 kVA, single-phase two winding transformer is to be used as an auto-transformer to supply 400 V from a 500 V voltage source. When tested as a two winding transformer at rated load and 0.8 p.f. lagging, its efficiency was found to be 0.95.<br>i. Determine its kVA rating as an Auto-transformer.<br>ii. Find its efficiency as an auto-transformer at rated load and at 0.8 p.f. lagging. | BT3 | CO5 | PO3 |
| 4. | Three number of single-phase ideal transformers, each of rating 5 kVA, 200V/100V,50 Hz is connected in star/delta fashion to supply a balanced three phase 10 kW,0.8 power factor load at 100 V (line to line).<br><br>A)Calculate line and phase currents on the secondary and primary sides.<br><br>B)Give the comparison of autotransformer with two winding transformer on various aspects. | BT3 | CO5 | PO3 |
| 5. | Derive the expression for saving of copper in autotransformer. | BT3 | CO5 | PO3 |
| 6. | A three-phase step down transformer is connected to 6.6 kV supply mains and takes 80A. Calculate its secondary line voltage and line currer the following connections if the ratio of turns per phase is 16. (i) Y-Y (ii) Y-Δ (iii) Δ-Δ. | BT3 | CO5 | PO3 |

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| 7. | In an auto-transformer, the power transferred from primary to secondary circuit is partly by conduction and partly by induction. Explain. | BT2 | CO5 | PO3 |
| 8. | Explain the Open-Delta (V–V) connection of three-phase transformers. Discuss its operation, merits, demerits, and applications. | BT2 | CO5 | PO3 |
| 9. | Explain the Scott connection with neat circuit diagrams and phasor diagrams. Show how three-phase power is converted into two-phase power. | BT4 | CO5 | PO3 |
| 10. | A Scott-connected transformer supplies two single phase furnaces at 100V, each taking 200kW. The load on the leading phase is at unity power factor and that on the other phase is 0.8 lagging power factors. The 3-phase input line voltage is 11000V. Calculate the line currents on the primary side. Neglect the magnetizing current and leakage impedance. | BT4 | CO5 | PO3 |