Uka Tarsadia University (Diwaliba Polytechnic)
Diploma in Electrical Engineering
MCQ / True and False (Single Phase and Polyphase Transformer)

CH: 1 Basic transformer theory

1. Which of the following relation is true for magnetic circuits?
   A. **$F = \phi S$** B. $F = \phi / S$
   C. $F = \phi^2 S$ D. $F = \phi / S^2$

2. What happens to the MMF when the magnetic flux decreases?
   A. Increases B. **Decreases**
   C. Remains constant D. Becomes zero

3. The MMF is directly proportional to the magnetic flux.

   True

4. Calculate the MMF when the magnetic flux is 5Wb and the reluctance is 3A/Wb.
   A. 10AT B. 10N
   C. 15N D. **15AT**

5. The magnetic flux is measured in _____.
   A. Weber B. weber/m^2
   C. m^2/weber D. weber/m^3

6. The _____ is defined as the total number of lines of force in a magnetic field.
   A. **Magnetic flux** B. Magnetic density
   C. Magnetic pole D. Magnetic strength

7. The device which transfers power from one circuit to another circuit at same frequency is known as _____.
   A. Motor B. Generator
   C. Inductor D. **Transformer**

8. M.M.F. of magnetic circuit is analogous to _____in electrical circuit.
   A. Electric current B. Current density
   C. **Electro motive force** D. Resistance

9. The reluctance of a material is defined as _____
   A. **Opposition offered to the magnetic field** B. Its ability to conduct magnetic flux
   C. Opposition offered to the electric field D. None of above

10. Hysteresis loss in magnetic material depends on _____
    A. Area of hysteresis loop
    B. Frequency of reversed of field
    C. Volume of magnetic material
    D. **All of above**

11. Area of hysteresis loop shows _____
    A. **Hysteresis loss**
    B. Eddy current loss
    C. Both hysteresis and eddy current loss
    D. Copper loss

12. The magnetic flux density is measured in _____.
    A. Weber
    B. **weber/m^2**
    C. m^2/weber
    D. weber/m^3

13. The magnetic flux is defined as the total number of _____in magnetic field.
    A. **Lines of force**
    B. Magnetic density
    C. Magnetic pole
    D. Magnetic strength

14. The device which step up or step down the voltage level at same frequency is known as _____.
    A. Motor
    B. Generator
    C. Inductor
    D. **Transformer**

15. E.M.F. of electrical circuit is analogous to _____in magnetic circuit.
    A. **M.M.F.**
    B. Reluctance
    C. Flux
    D. Flux density

16. The opposition offered to the magnetic field is defined as _____
    A. **Reluctance**
    B. M.M.F.
    C. Flux density
    D. Field intensity

17. Flux density is given by formula
    A. $B = A / \phi$
    B. $B = \phi / A^2$
    C. **$B = \phi / A$**
    D. $B = A^2 / \phi$

18. Magnetic flux density is _____.
    A. **Flux per unit area**
    B. Flux per meter length
    C. Unit area per flux
    D. Meter length per flux

19. Which of the following formula of reluctance is correct?
    A. $S = l / (\mu * A)$
    B. $S = A / (\mu * l)$
    C. $S = (\mu * l) / A$
    D. $S = l^2 / A$

20. What is MMF?
    A. Magnetic Machine Force
    B. **Magneto Motive Force**
    C. Magnetic Motion Force
    D. Magneto motion Force

CH: 2 Single phase transformers

1. What is the principle of the transformer?
   A. Gauss law
   B. Coulomb's law
   C. **Electromagnetic induction**
   D. Ampere's law

2. Voltage induced in secondary coil of transformer is given by_____.
   A. N_P*V_P/N_S
   B. **N_S*V_P/N_P**
   C. $(N_P/V_P)*N_S$
   D. $N_P/(V_P*N_S)$

3. According to _____ induced e.m.f. opposes the cause due to which they are produced.
   A. **Lenz law**
   B. Newton's law
   C. Faraday's law
   D. Coulomb's law

4. The emf induced in a coil having N turns is?
   A. $E = \phi/t$
   B. **$E = N*\phi/t$**
   C. $E = N*\phi*t$
   D. $E = N^2*\phi*t$

5. According to _____ induced emf is equal to rate of change of magnetic flux.
   A. Newton's law
   B. Lenz law
   C. **Faraday's law**
   D. Coulomb's law

6. Transformer cores are laminated to reduce
   A. Copper loss
   B. **Eddy current loss**
   C. Hysteresis loss
   D. All of the above

7. To reduce hysteresis loss, transformer core is made of
   A. **Silicon steel**
   B. Aluminium
   C. Copper
   D. Lead

8. If R_1 is the primary winding resistance and R_2 is the secondary winding resistance then the equivalent resistance of the transformer as referred to the primary is_____.
   A. **$R_1+ R_2/K^2$**
   B. $R_2+ R_1/K^2$
   C. $R_1+ K^2R_2$
   D. $R_2+ K^2R_1$

9. If the transformer is loaded then the secondary terminal voltage falls for lagging power factor.
   A. **True**
   B. False

10. If the transformer is loaded then the secondary terminal voltage falls for leading power factor.
   A. True
   B. **False**

11. The efficiency of the transformer will be maximum when
    A. Iron losses is equal to the twice of the copper losses
    B. Copper losses is equal to the twice of the iron losses
    C. **Iron losses is equal to the copper losses**
    D. All of these

12. Copper losses occurs due to ohmic resistance in
    A. Primary winding
    B. Secondary winding
    C. **Both primary and secondary winding**
    D. None of these

13. In transformer if the secondary is open circuited then its terminal voltage is
    A. **Same as the induced emf**
    B. Greater than the induced emf
    C. Lesser than the induced emf
    D. None of these

14. The steel used for laminations should have high permeability.

    A. **True**
    B. False

15. Which of the following equation correctly represents the exact phasor diagram of transformer?
    A. **$V_1=E_1+I_1R_1+jI_1X_1$**
    B. $V_1=E_1+I_1R_1+jI_2X_2$
    C. $V_2=E_2+I_1R_1+jI_1X_1$
    D. $V_1=E_1-I_1R_1+jI_1X_1$

16. If R_1 is the primary winding resistance and R_2 is the secondary winding resistance then the equivalent resistance of the transformer as referred to the secondary is
    A. $R_1+ R_2/K^2$
    B. $R_2+ R_1/K^2$
    C. $R_1+ K^2R_2$
    D. **$R_2+ K^2R_1$**

17. Which of the following does not change in an ordinary transformer _____?
    A. **Frequency**
    B. Voltage
    C. Current
    D. Any of the above

18. If primary number of turns are higher then, transformer is called _____

    A. **Step-down**
    B. Step-up
    C. One-one
    D. Autotransformer

19. If the power factor of a transformer is increases, then its efficiency will decrease.
    A. True
    B. **False**

20. If secondary number of turns are higher then, transformer is called _____

    A. Step-down
    B. **Step-up**
    C. One-one
    D. Autotransformer

CH: 3 Testing and design of Single Phase Transformer

1. In core type transformer, the coils are wound in helical layers, each layers being insulated from each other by using
   A. Paper B. Cloth
   C. Cooling ducts D. **All of these**
2. For a transformer, no load primary current has two components, magnetizing component and active components. The magnetizing component is given by
   A. $I_0 \cos \Phi_0$ B. $I_0 \cot \Phi_0$
   C. **$I_0 \sin \Phi_0$** D. $I_0 \tan \Phi_0$
3. For a transformer, no load primary current has two components, magnetizing component and active components. The active component is given by
   A. **$I_0 \cos \Phi_0$** B. $I_0 \cot \Phi_0$
   C. $I_0 \sin \Phi_0$ D. $I_0 \tan \Phi_0$
4. For a transformer, no load primary current has two components, magnetizing component and active components.
   True
5. For a transformer, no load primary current has only one component.
   False
6. The transformer ratings are usually expressed in
   A. Volts B. Amperes
   C. kW D. **kVA**
7. The open circuit test in a transformer is used to measure___
   A. Copper loss B. Winding loss
   C. Total loss D. **Core loss**
8. The open circuit test in a transformer is used to measure core loss.
   True
9. The open circuit test in a transformer is not used to measure copper loss.
   True
10. The open circuit test in a transformer is not used to measure core loss.
    False
11. The short circuit test in a transformer is used to measure copper loss.
    True
12. Which of the following losses are neglected in the short circuit test in a transformer?
    A. Copper loss B. Winding loss
    C. Total loss D. **Core loss**
13. Why OC test is performed on LV side?
    A) Simple construction
    B) **Less voltage is required and parameters can be transformed to HV side**
    C) It'll not give losses if conducted on HV side
    D) HV side does not have connections for voltage
14. While conducting short-circuit test on a transformer which side is short circuited?
    A) High voltage side
    B) Low voltage side

C) Primary side
D) Secondary side

15. During short circuit test why iron losses are negligible?
A) The current on secondary side is negligible
B) The voltage on secondary side does not vary
C) **The voltage applied on primary side is low**
D) Full-load current is not supplied to the transformer

16. OC, SC, Sumpner's tests are enough to find all the parameters related to a transformer.
True

17. Sumpner's test is performed on _____
A) Single transformer at a time
B) **Only two transformers at a time**
C) Minimum 2 transformers at a time
D) Many transformers at a time

18. Which test is sufficient for efficiency of two identical transformers under load conditions?
A) Short-circuit test
B) **Back-to-back test**
C) Open circuit test
D) Any of the above

19. In Sumpner's test _____
A) Primaries can be connected in either way
B) **Primaries are connected in parallel with each other**
C) Primaries of both transformers are connected in series with each other
D) No need to connect primaries

20. A good voltage regulation of a transformer indicates _____
A) **output voltage fluctuation from no load to full load is least**
B) output voltage fluctuation with power factor is least
C) difference between primary and secondary voltage is least
D) difference between primary and secondary voltage is maximum

21. In kapp regulation method, which of the following parameters are needed?
A. Equivalent reactance (X_{02}) B. Equivalent resistance (R_{02})
C. Both A & B D. None of above

22. Which of the following are the parts of kapp regulation diagram?
A. Open circuit EMF circle B. Terminal voltage circle
C. Both A & B D. None of above

23. Which types of windings are used in transformer?
A. Helical winding B. Cylindrical winding
C. Continuous disc winding **D. All of above**

24. Which types of windings are used in shell type transformer?
A. Helical winding B. Cylindrical winding
C. Continuous disc winding D. **Sandwich type winding**

25. Which of the following is not the type of helical winding?
A. Single Helical Winding B. Double Helical Winding
C. Disc-Helical Winding D. **Cylindrical winding**

26. Window space factor is defined as the ratio of copper area in the window to the area of the window.
A. **True** B. False

CH: 4 three phase transformers

1 Scott Connection is the method of connecting two single phase transformer to perform the 3-phase to 2-phase conversion and vice-versa.
T

2 Y-Y connection is the method of connecting two single phase transformer to perform the 3-phase to 2-phase conversion and vice-versa.
F

3 Δ-Δ connection is the method of connecting two single phase transformer to perform the 3-phase to 2-phase conversion and vice-versa.
F

4 Δ-Y connection is the method of connecting two single phase transformer to perform the 3-phase to 2-phase conversion and vice-versa.
F

5 In Dd0 connection, primary winding is connected in star connection.
F

6 In Yd0 connection, primary winding is connected in star connection.
T

7 In Yy11 connection, the phase difference between primary and secondary is +30 degree.
T

8 In Yy11 connection, the phase difference between primary and secondary is -30 degree.
F

9 In Yy1 connection, the phase difference between primary and secondary is -30 degree.
T

10 In Yy1 connection, the phase difference between primary and secondary is +30 degree.
F

11 Teaser transformer is the component of Scott connection.
T

12 In a V-V circuit, the ratio of (operating capacity/Available capacity) is 86.6 percentage.
T

13 T-T connection is also known as scott connection.
T

14 For the parallel operation of two single phase transformers, it is necessary that they should have same polarity.
T

15 For the parallel operation of two single phase transformers, it is necessary that they should have different polarity.
T

16 Star – delta connection is used with generation and transmission transformer.
T

17 Delta – delta connection is used with generation and transmission transformer.
F

18 Star – star connection is used with generation and transmission transformer.
F

19 For carrying out parallel operation, both transformers should have same R / X ratio.
F

20 For carrying out parallel operation, both transformers should have same X / Z ratio.
F

21 For carrying out parallel operation, both transformers should have same R / Z ratio.
F

22 Open delta connection has VA rating of $1/\sqrt{3}$ times delta/delta VA rating.
T

23 Open delta connection has VA rating of $\sqrt{3}$ times delta/delta VA rating.
F

24 Open delta connection has VA rating of 3 times delta/delta VA rating.
F

25 Open delta connection has VA rating of 2 times delta/delta VA rating.
F

26 The most commonly used connections for power systems as a step-up and step-down transformer are star- delta and delta – star.
T

27 In a transformer the tapping are generally provided on primary and secondary side.
T

28 In mines we use a bank of 3 single phase transformers
T

29 The phase shift in a star-star connected three phase transformer is 0 degree
T

30 The phase shift in a star-star connected three phase transformer is 30 degree
F

CH: 5 Construction and Testing of Three Phase Transformer

1. Breather is provided in a transformer to
   A.**Absorb moisture of air during breathing**
   B. provide cold air in the transformer
   C. The filter of transformer oil
   D. None of above
2. Oil is provided in an oil filled transformer for
   A. Lubrication
   B. Insulation
   C. cooling
   D. both cooling and insulation
3. Which of the following is not a part of transformer?
   A. Conservator
   B. breather
   C. Exciter
   D. Buchholz relay
4. Noise of transformer mainly due to
   A. Cooling fan
   B. magnetostriction in an iron core
   C. Mechanical vibration
   D. All of the above
5. Natural air cooling method is also known as self – cooled method.
   A. **True** B. False
6. Natural air cooling method is effective for higher output transformer.
   A. True B. **False**
7. The transformer oil should have _____ Viscosity.
   A. **Low** B. High
   C. Zero D. None of above.
8. The part of a transformer which is visible from outside _____
   a) **Bushings**
   b) Core
   c) Primary winding
   d) Secondary winding
9. Part of the transformer which undergoes most damage from overheating is _____
   a) Iron core
   b) Copper winding
   c) **Winding insulation**
   d) Frame or case
10. If a transformer is continuously operated the maximum temperature rise will occur in _____
    a) Core
    b) **Windings**
    c) Tank
    d) Cannot be determined

11. Which is the most common, famous and adopted method of cooling of a power transformer?
    a) Air blast cooling
    b) Natural air cooling
    c) **Oil cooling**
    d) Any of the above method can be used
12. Function of conservator in an electrical transformer is _____
    a) Supply cooling oil to transformer in time of need
    b) Provide fresh air for cooling the transformer
    c) **Protect the transformer from damage when oil expends due to heating**
    d) Cannot be determined
13. Silica jell is used as moisture absorber in breather.
    A. **True** B. False
14. Which chemical is used in breather?
    a) Asbestos fibre
    b) Silica sand
    c) Sodium chloride
    d) **Silica gel**
15. Which of the following is the most important quality required for chemical in breather, so that it can be used perfectly in an electrical transformer?
    a) Ionizing air
    b) **Absorbing moisture**
    c) Cleansing the transformer oil
    d) Cooling the transformer oil
16. A transformer oil used in an electrical transformer must be free from _____
    a) Gases
    b) Odour
    c) Sludge
    d) Moisture
17. On which of the following transformer, Buchholz's relay can be fixed on?
    a) Auto-transformers
    b) Air-cooled transformers
    c) Welding transformers
    d) Oil cooled transformers
18. Buchholz's relay will give warning and protection against _____
    a) **Electrical fault inside the transformer itself**
    b) Electrical fault outside the transformer in outgoing feeder
    c) For both outside and inside faults
    d) Cannot be determined
19. Which of the following listed component will see and perform according to changes in volume of transformer cooling oil due to variation of atmospheric temperature during day and night?
    a) **Conservator**
    b) Breather
    c) Bushings
    d) Buchholz relay

20. Natural air cooling method can't be adopted because of some unavoidable effects, beyond _____
    a) **1.5 MVA**
    b) 5 MVA
    c) 15 MVA
    d) 50 MVA
21. Which type of winding is used in 3-phase shell-type transformer?
    a) Circular type
    b) **Sandwich type**
    c) Cylindrical type
    d) Rectangular type
22. How 3-phase transformers are constructed?
    a) A bank of 3 single phase transformers
    b) A single 3-phase transformer with the primary and secondary of each phase wound on three legs of a common core
    c) **both 1 & 2**
    d) By different method
23. In core type 3-phase transformer flux path chooses how many paths to return?
    a) **2**
    b) Single
    c) 3
    d) Many
24. A three-phase transformer generally has the three magnetic circuits interlaced.
    a) True
    b) False
25. For performing back to back test on 3-phase transformer, transformers should be _____
    a) non-identical
    b) **identical**
    c) they can be identical or non-identical
    d) they should not be identical nor non-identical

CH: 6 Special purpose transformers

1. An auto transformer can be used as
   A. Step up device
   B. Step down device
   C. Both step up and step down
   D. None of the above
2. Auto transformers are often used to step up or step down voltages upto _____range.
   A. **240 V** B. 440 V
   C. 11 kV D. 33 kV
3. In Auto Transformer, one single winding is used as primary winding as well as secondary winding.
   A. **True** B. False
4. The primary is electrically not connected to the secondary on auto transformer.
   A. True B. **False**
5. In auto transformer primary is magnetically coupled with secondary winding.
   A. **True** B. False
6. In an Auto Transformer, The Primary and Secondary are_____coupled.
   A. Electrically only
   B. Magnetically only
   C. Both electrically & magnetically
   D. None of the above
7. Which of the following is the main advantage of auto transformer over a two winding transformer?
   A. Reduces hysteresis losses
   B. Reduce eddy current losses
   C. Copper losses are negligible
   D. Saving of copper material
8. For the same excitation voltage and winding currents, the autotransformer gives
   a. Less output than two winding transformer
   b. Equal to the output of two winding transformer
   c. Half of the output of two winding transformer
   d. **More than the output of the two winding transformer**
9. Compared to the two winding transformer, in an autotransformer the leakage reactance and copper losses is
   a. less, more
   b. **less, less**
   c. more, more
   d. more, less
10. Total windings present in a autotransformer are _____
    a) **1**
    b) 2
    c) 3
    d) 4

11. An autotransformer compared to its two-winding counterpart has a higher operating efficiency.
    a) True
    b) False
12. Where the tappings are provided in a transformer?
    a) At the phase end of LV side
    b) At the phase end of HV side
    c) At the neutral side end of the HV side
    d) **At the middle of HV side**
13. Tappings are on _____
    a) LV side of a transformer
    b) **HV side of transformer**
    c) Not on any side
    d) On both sides
14. Potential transformers are used to measure the large value of current.
    A. True B. **False**
15. Current transformers are used to measure the large value of current.
    A. **True** B. False
16. Potential transformers are used to measure the large value of voltage.
    A. **True** B. False
17. Current transformers are used to measure the large value of voltage.
    A. True B. **False**
18. Welding transformer is _____
    a) step-up transformer
    b) **step-down transformer**
    c) auto transformer
    d) one-one transformer
19. V-I characteristics of welding transformer are decreasing steeply.
    A. **True** B. False
20. For welding transformer as current increases induced emf _____
    a) stays constant
    b) increases
    c) **decreases**
    d) depends on application
21. Welding transformers work on principle that weld is actually _____
    a) open circuit
    b) **short circuit**
    c) circuit with finite resistance
    d) circuit with finite reactance
23. What is the voltage rating of welding transformer?
    A. **15 V** B. 230 V
    C. 100 V D. 400 V
24. Secondary current of welding transformer is about 200 A to 600 A.
    A. **True** B. False
25. DC supply can be used for welding transformer.
    A. **True** B. False

26. The impedance of welding transformer may be higher than that of the impedance of a general purpose transformer.
    A. **True** B. False
27. Instrument transformer cannot be used for protective transformer.
    A. True B. **False**
28. Instrument transformer is used for the measurement purpose.
    A. **True** B. False
29. CT stands for
    A. Capacitor Transient B. **Current Transformer**
    C. Capacitor Transformer D. Current Transient
30. PT stands for
    A. **Potential Transformer** B. Passive Transformer
    C. Passive Transient D. Potential Transient