Maximum : 100 marks

Time : 1 hour and 15 minutes

1. In series RLC circuit at resonance :

    (A) V is in phase with I

    (B) I is maximum

    (C) Inductive reactance = Capacitive reactance

    (D) All the above

2. The superposition theorem is essentially based on the concept of :

    (A) Duality   (B) Linearity

    (C) Reciprocity   (D) Non-linearity

3. The voltage drop across a resistor of 100 Ω is 10 volts. The wattage of the resistor must be :

    (A) 2 W   (B) 1 W

    (C) 0.5 W   (D) 0.25 W

4. For a symmetric lattice network the value of parameters is 3 Ω and that of diagonal impedance is 5 Ω. Then the Z parameters of the network are given below :

    (A) $Z_{11} = Z_{22} = 2 \, \Omega$ (B) $Z_{12} = Z_{21} = 0.5 \, \Omega$

    (C) $Z_{11} = Z_{22} = 4 \, \Omega$ (D) $Z_{12} = Z_{21} = 1 \, \Omega$

5. The following relation expresses Ohms law at a point :

    (A) $A = j = \sigma E$ (B) $\nabla \cdot J = -\dfrac{\partial \rho}{\partial t}$

    (C) $\nabla \cdot D = \rho$ (D) $\nabla^2 V = -\dfrac{\rho}{E}$

6. Maxwell's divergence equation for the magnetic field is given by :

    (A) $\nabla \times B = 0$ (B) $\nabla \cdot B = 0$

    (C) $\nabla \times B = \rho$ (D) $\nabla \cdot B = \rho$

7. Unit of magnetic flux is :

    (A) Ampere turns   (B) Tesla

    (C) Coulomb   (D) Weber

8. If E is the field between the plates of a parallel plate capacitor, the electrostatic energy per unit volume is :

(A) $\varepsilon_0 E$

(B) $\varepsilon_0 E^2$

(C) $(1/2)\varepsilon_0 E^2$

(D) $\varepsilon_0 / 2 E^2$

9. The condition for an electric field E to be a static electric field is :

(A) $\oint_s \overline{E} \cdot \overline{ds} = 0$

(B) $\oint_s \overline{E} \cdot \overline{dl} = 0$

(C) $\nabla \times \overline{E} = 0$

(D) None of these

10. Which of the following system is non-linear?

(A) $y(t) = x(t-1) - 2x(t-2) + x(t-3)$

(B) $y(t) = 4x(t)$

(C) $y(t) = x(t-1) - 2x(t-x) - x(t-3)$

(D) $y(t) = x(t) + 2.5$

11. The system $y(t) = e^{-x(t)}$:

(A) stable, causal

(B) non causal, stable

(C) unstable, causal

(D) unstable, non-causal

12. The system $y(x+3) + y(x+2) = x(x+4)$ is :

(A) causal and memory less

(B) causal and has memory

(C) is causal

(D) is non-causal

13. If $x(t)$ is odd, then Fourier series coefficients must be :

(A) real and odd

(B) real and even

(C) imaginary and even

(D) imaginary and odd

14. The trigonometric Fourier series of an even function of time does not have the :

(A) Cosine terms

(B) Sine terms

(C) Both cosine and sine terms

(D) DC term

15. The Z transform of the sequence $x(n) = u(n)$ where

$u(n) = 1$ for $n \geq 0$

$= 0$ for $n < 0$ is :

(A) $1/(z-1)$

(B) $z/(z-1)^2$

(C) $z/(z-1)$

(D) $(z-1)/z$

4

16. Kelvin's double bridge is used for the measurement of :

    (A) Low capacitance   (B) High inductance

    (C) High resistance   (D) Low resistance

17. Megger is basically a :

    (A) Moving iron instrument   (B) Moving coil instrument

    (C) Hot wire instrument   (D) Electrolytic type instrument

18. A quadrant electrometer measures :

    (A) Charge   (B) Capacitance

    (C) Inductance   (D) Current

19. A circuit has impedance of $(3+j4)$. If a voltage $(100+j50)$ is applied, power in the circuit will be across the $5\,\Omega$ resistance in the mesh shown below is :

    (A) 100 W   (B) 250 W

    (C) 500 W   (D) 660 W

20. TOD meter is used to record :

    (A) Energy, time and demand   (B) Energy, power and demand

    (C) Power, demand and time   (D) None of the above

21. In an induction machine, if the air gap is increased :

    (A) Efficiency will be improved   (B) Speed will reduce

    (C) Power factor will be lowered   (D) Brake down torque will be reduced

22. The all-day efficiency of a transformer depends on :

    (A) its copper loss   (B) amount of load

    (C) the duration of load   (D) both (B) and (C) are correct

23. A transformer has negative voltage regulation when its power factor is :

    (A) Zero   (B) Unity

    (C) Leading   (D) Lagging

24. Instrument transformers are used in alternating current circuits for extending the range of :

    (A) Ammeters   (B) Voltmeters

    (C) Wattmeter's   (D) All the above

25. An autotransformer has a transformation ratio of 0.7, supplies a load of 2 KW. The power transferred conductively from primary to secondary is :

    (A) 0.6 KW   (B) 1.4 KW

    (C) 0.35 KW   (D) None of the above

26. The number of armature parallel paths in a triplex, lap wound, 12 pole, dc generator :

    (A) 12   (B) 24

    (C) 36   (D) 6

27. The full load copper loss of a transformer is 1200 W its copper loss at 50% load would be :

    (A) 300 W   (B) 600 W

    (C) 1200 W   (D) 1600 W

28. A 400 KVA, 200 Hz transformer is operated at 100 Hz, its KVA rating is :

    (A) 200 KVA   (B) 400 KVA

    (C) 800 KVA   (D) 2000 KVA

29. Over excited synchronous generator runs at :

    (A) leading pf   (B) lagging pf

    (C) UPF   (D) none of the above

30. The voltage between adjacent coils in a cross over winding of a transformer should not be greater than :

    (A) 500–700 V   (B) 800–1000 V

    (C) 1200–1500 V   (D) 200–400 V

31. The percentage of silicon in transformer stampings is usually limited to :

    (A) 0.4%   (B) 1.4%

    (C) 4%   (D) 14%

32. The permeability of a material is 0.999991, it is classified as :

    (A) paramagnetic   (B) diamagnetic

    (C) ferromagnetic   (D) ferrite

33. Hysteresis loss varies with frequency f as :

   (A) f
   (B) $f^{1.6}$

   (C) f^2
   (D) $f^{2.6}$

34. Usual values of flux density B_m for a power transformer using hot rolled silicon steel is :

   (A) 1.1 to 1.35 Wb/m²
   (B) 1.25 to 1.45 Wb/m²

   (C) 1.55 Wb/m²
   (D) 1.6 to 1.7 Wb/m²

35. The ratio of height to width of window while designing window dimensions of a transformer can be between :

   (A) 1 to 2
   (B) 2 to 4

   (C) 4 to 6
   (D) none of these

36. Skewing of rotor slots in an induction motor helps in :

   (A) Improving heat transfer
   (B) Reducing noise

   (C) Suppressing undesirable harmonics
   (D) All the above

37. In induction motors larger the air gap ————————— noise level and ————————— cooling.

   (A) increases — improves
   (B) reduces — improves

   (C) reduces — reduces
   (D) none of the above

38. Alternators are usually rated in :

   (A) KVA
   (B) KVA and KW

   (C) KW
   (D) KVA, KW and power factor

39. Due to skin effect the effective resistance ————————— with increase in frequency.

   (A) decreases
   (B) increases

   (C) remains constant
   (D) none

40. The surge impedance of a transmission line is given by :

   (A) $\sqrt{(LC)}$
   (B) $\sqrt{(L/C)}$

   (C) $\sqrt{(C/L)}$
   (D) $\sqrt{(L+C)}$

41. MHO relay is usually employed in protection of :

    (A) short lines only   (B) medium lines only

    (C) long lines only   (D) all the above

42. For interrupting capacitive currents which circuit breaker is used :

    (A) MCCB   (B) ACB

    (C) SF6   (D) VCB

43. Per unit value of any quantity is defined as :

    (A) Base value in any unit to actual value in the same unit

    (B) Actual value in any unit to the base value in the same unit

    (C) Phase value in any unit to line value in the same unit

    (D) None of the above

44. A relay which operates when the alternating current exceeds a certain preset value :

    (A) Over current relay   (B) Reverse power relay

    (C) Polarized relay   (D) Under voltage relay

45. A 10 MVA generator has power factor 0.866 lagging. The reactive power produced will be :

    (A) 10 MVA   (B) 8 MVA

    (C) 5 MVA   (D) 1.34 MVA

46. Corona loss in HVDC transmission compared that of AC transmission is :

    (A) Very high   (B) Low

    (C) Same   (D) None of these

47. Nyquist stability is used to determine :

    (A) Absolute stability   (B) Relative stability

    (C) Both   (D) None

48. Compared to a closed loop system an open loop system is :

    (A) more stable and more accurate   (B) more stable and less accurate

    (C) less stable and more accurate   (D) less stable and less accurate

49. In a feedback amplifier, the band width :

    (A)   increases by the same amount as the gain decreases

    (B)   decreases by the same amount as the gain decreases

    (C)   decreases by the same amount as the gain increases

    (D)   remains unaffected

50. The main application of transfer function is in the study of :

    (A)   steady state behavior of systems

    (B)   steady state as well as transient behavior of the systems

    (C)   only transient behavior of the systems

    (D)   none of these

51. Given the system specification in time domain, best approach for designing is :

    (A)   Nyquist plot   (B)   Root locus

    (C)   Bode's plot   (D)   None of these

52. The band width of a control system can be increased by :

    (A)   phase lag compensator   (B)   phase lead compensator

    (C)   phase lag-lead compensator   (D)   all the above

53. The servo motor differs from other motors since it has :

    (A)   high inertia and high torque   (B)   low inertia and low torque

    (C)   low inertia and high torque   (D)   constructionally it is different

54. A 100 V voltmeter has an accuracy of 5% on full scale. The percentage error while measuring 50 V will be :

    (A)   2.5%   (B)   5%

    (C)   7.5%   (D)   10%

55. Moving coil in dynamometer wattmeter is connected :

    (A)   in series with fixed coil   (B)   across load

    (C)   in series with load   (D)   across supply

56. Induction wattmeter's are free from ——————— error.

    (A)   phase   (B)   creeping

    (C)   frequency   (D)   temperature

57. Hay's bridge is particularly used for measurement of :

    (A)   inductance Z with large phase angle

    (B)   mutual inductance

    (C)   self inductance

    (D)   capacitance and dielectric loss

58. Operation of Q meter is based on :

    (A)   series induction   (B)   mutual induction

    (C)   series resonance   (D)   eddy current

59. At low power factor dynamometer type wattmeter will cause :

    (A)   no error   (B)   high error

    (C)   low error   (D)   none of these

60. The observed signal in an oscilloscope should be applied :

    (A)   across its X plates   (B)   across its Y plates

    (C)   to the horizontal amplifier   (D)   to the trigger circuit

61. A modern power semiconductor device IGBT combines the characteristic of :

    (A)   BJT and MOSFET   (B)   FCT and GTO

    (C)   SCR and MOSFET   (D)   SCR and BJT

62. In thyristor latching current is ———————— than holding current.

    (A)   Equal   (B)   Less

    (C)   Greater   (D)   None of these

63. Voltage feedback amplifier is a ———————— amplifier.

    (A)   shunt – shunt   (B)   shunt – series

    (C)   series – shunt   (D)   series – series

64. Which of the following is a fastest ADC?

    (A)   Counter type   (B)   Flash type

    (C)   Successive approximation type   (D)   Dual slope type

65. Which of the following is the most popular DAC?

    (A) R – 2R ladder type   (B) weighted – resister type

    (C) switched – current source type   (D) switched – capacitor type

66. The sequential circuit in which the output depends only on the present state of flip-flops is called a ——————— circuit.

    (A) Mealy   (B) Moore

    (C) Transition   (D) None of the above

67. A ——————— circuit is used to improve the rise time and fall time of pulses.

    (A) Multivibrator   (B) Oscillator

    (C) Monostable   (D) Schmitt trigger

68. How many inputs and outputs does a full adder have?

    (A) 2 inputs and 2 outputs   (B) 2 inputs and 1 output

    (C) 3 inputs and 2 outputs   (D) 2 inputs and 3 outputs

69. For an SCR, dv/dt protection is achieved through the use of :

    (A) RL in series with SCR   (B) RL across SCR

    (C) L in series with SCR   (D) None of the above

70. A single phase voltage controller feeds an induction motor and a heater, which of the following statements are true?

    (A) In both the loads, fundamental and harmonics are useful

    (B) In induction motor only fundamental and in heater only harmonics are useful

    (C) In induction motor only fundamental and in heater fundamental as well as harmonics are useful

    (D) In induction motor only harmonics and in heater only fundamental are useful none of the above

71. A motor armature supplied through phase control SCR's receives a smoother voltage shape at :

    (A) high motor speeds   (B) low motor speeds

    (C) rated speed   (D) none of these

72. A single phase full bridge voltage source inverter (VSI) has inductor as the load. For a constant source voltage, the current through the inverter is :

    (A) Square wave   (B) Sine wave

    (C) Saw tooth wave   (D) Triangular wave

73. A single phase full bridge inverter can operate in load commutation mode in case load consists of :

    (A) RLC over damped   (B) RLC under damped

    (C) RLC critically damped   (D) None of these

74. Hard firing of a thyristor :

    (A) Reduces TURN ON time   (B) Reduces TURN OFF time

    (C) Increases TURN ON time   (D) Increases TURN OFF time

75. The maximum load that is usually connected in power sub-circuit is :

    (A) 2000 W   (B) 3000 W

    (C) 1500 W   (D) 5000 W

76. The insulation resistance of HV circuit breaker is :

    (A) $2\,K\Omega$ (B) $20\,K\Omega$

    (C) $20\,M\Omega$ (D) $2000\,M\Omega$

77. The range of a dc ammeter can be increased by using :

    (A) Series resistor   (B) Inductance in series

    (C) Shunt resistor   (D) Capacitance in parallel

78. Which of the following wires will have the least diameter?

    (A) 1 SWG   (B) 10 SWG

    (C) 20 SWG   (D) 40 SWG

79. The rated load of an underground cable is always ——————— the natural load.

    (A) higher than   (B) lesser than

    (C) equal to   (D) none of these

80. While laying 11 KV cables, the minimum bending radius has to be (If D = diameter of the cable) :

    (A) 2 D   (B) 4 D

    (C) 6 D   (D) 12 D

81. Identify the present Governor of Kerala :

    (A) Sheela Kaul   (B) Nikhil Kumar

    (C) Sheela Dheeshith   (D) H.R. Bhradwaj

82. Name the Kerala reformer who was famous for 'Villu Vandi Yathra' :
    - (A) K. Kelappan
    - (B) Ayyankali
    - (C) Sree Narayana Guru
    - (D) Mannathu Padmanabhan

83. The poem 'Udyanavirunnu' was penned by :
    - (A) Bhavabhuti
    - (B) Kumaranasan
    - (C) Kumara Guru
    - (D) Pandit Karuppan

84. Srinagar is situated on the bank of the river :
    - (A) Indus
    - (B) Jhelum
    - (C) Ravi
    - (D) Godavari

85. 'Green Revolution' has been very successful in which of the following crops?
    - (A) Sugarcane
    - (B) Wheat
    - (C) Rice
    - (D) Barley

86. Bhagat Singh, Raja Guru, Sukhdev were hanged for their role in :
    - (A) Meerat conspiracy
    - (B) Civil disobedience strike
    - (C) Kaker Case
    - (D) Lahore Conspiracy

87. The person who led 'Ezhava memorial' of 1896 :
    - (A) Sree Narayana Guru
    - (B) Kumaranasan
    - (C) Dr. Palpu
    - (D) T.K. Madhavan

88. In which year was the human population census last conducted in India?
    - (A) 2001
    - (B) 2008
    - (C) 2011
    - (D) 2013

89. Who was the founder of 'Vavoottu Yogam'?
    - (A) Sahodaran Ayyappan
    - (B) Vagbhatananda
    - (C) Sree Narayana Guru
    - (D) Ayya Vaikundar

90. Which type of clouds are popularly called 'rain clouds'?
    - (A) Cumulonimbus
    - (B) Nimbostratus
    - (C) Cirrus
    - (D) Altocumulus

91. Who founded 'Prathyaksha Raksha Daiva Sabha' (PRDS)?
    - (A) Blessed Kuriakose Elias Chavara
    - (B) William Logan
    - (C) Poikayil Yohannan
    - (D) St. Thomas Acquinas

92. Sardar Sarovar project is to be constructed on the river :
    (A) Krishna   (B) Tapti
    (C) Brahmaputra   (D) Narmada

93. The 2016 edition of Olympic Games will be held in which country?
    (A) Russia   (B) Pakistan
    (C) Brazil   (D) Indonesia

94. The prestigious Gandhi Peace Prize – 2013 has been conferred to :
    (A) Chandi Prasad Bhatt   (B) Medhapadkar
    (C) Prabhat Padnaik   (D) Sugatha Kumari

95. Who was the founder of 'Ananda Maha Sabha'?
    (A) Ayya Vaikundar   (B) Brahmananda Swami Sivyogi
    (C) Swami Vivekananda   (D) Karunakara Guru

96. Which of the following states of India has longest coast line?
    (A) Kerala   (B) Tamilnadu
    (C) Gujarath   (D) Sikkim

97. The unique identification number has been associated with :
    (A) Aaswas   (B) Sweekar
    (C) Uphar   (D) Aadhaar

98. Vayalar Award 2013 was given to :
    (A) Prabha Varma   (B) Perumpadavam Sreedharan
    (C) M. Mukundan   (D) Sara Joseph

99. Name the journal published by Vagbhatananda :
    (A) Abinava Keralam   (B) Navabharat
    (C) Navamanjari   (D) Vivekodayam

100. Which of the following programme aims to bring the deprived sections of society with in the banking network through opening account?
    (A) Suvidha   (B) Saksharbharat
    (C) Swabhimaan   (D) Swasraya