213/2014

1. The average power delivered to an impedance $(4-j3)\Omega$ by a current $5\cos(100\pi t+100)$A is :

   (A) 50 W (B) 44.2 W (C) 62.5 W (D) 125 W

2. The power in a series RLC circuit will be half of that at resonance when magnitude of current is equal to :

   (A) $\frac{V}{2R}$ (B) $\frac{V}{\sqrt{2R}}$ (C) $\frac{V}{\sqrt{3R}}$ (D) $\frac{\sqrt{2V}}{R}$

3. The Thevenin's equivalent of a circuit operation at $\omega=5$ rads/s, has $V_{oc}=3.71 \angle 15.9°$ V and $Z_0=2.38-j0.667\ \Omega$. At this frequency, the minimal realization of the Thevenin's impedance will have a :

   (A) resistor and capacitor (B) resistor, capacitor and inductor
   (C) resistor and inductor (D) capacitor and inductor

4. If $\vec{E}$ is the electric intensity, $\nabla(\nabla * \vec{E})$ is equal to (a) (b) :

   (A) $\vec{E}$ (B) $|\vec{E}|$ (C) Zero (D) Null vector

5. The graph of an electrical network has N nodes and B branches. The number of links L, with respect to the choice of a tree, is given by :

   (A) $B-N+1$ (B) $B+N$ (C) $N-B+1$ (D) $N-2B-1$

6. Consider a long, two-wire line composed of solid round conductors. The radius of both conductors is 0.25 cm and the distance between their centres is 1 m. If this distance is doubled, then the inductance per unit length :

   (A) increases but does not double (B) halves
   (C) doubles (D) decreases but does not halve

7. A series R - L - C circuit has R = 50 Ω; L = 100 μH and C = 1 μF. The lower half power frequency of the circuit is :

   (A) 30.55 kHz (B) 1.92 kHz (C) 51.92 kHz (D) 3.055 kHz

8. A passive 2-port network is in a steady-state. Compared to its input, the steady state output can never offer :

   (A) higher voltage (B) lower impedance
   (C) better regulation (D) greater power

9. If A.C. voltage is applied to capacitive circuit, the alternating current can flow in the circuit because :
   (A) discharging current can flow
   (B) of high peak value
   (C) charging current can flow
   (D) varying voltage produces the charging and discharging currents

10. "The total electric flux through any closed surface surrounding charges is equal to the amount of charge enclosed". The above statement is associated with :
   (A) Coulomb's square law (B) Maxwell's second law
   (C) Maxwell's first law (D) Gauss's law

11. The voltage induced in a transformer per turn is :
   (A) less in primary than in secondary
   (B) more in primary than in secondary
   (C) same whether it is primary or secondary
   (D) twice in primary than in secondary

12. A 3 - phase, 3 - wire, 100 V system supplies a balanced delta connected load of $z = 2 + j7\Omega$. The line currents when one of the lines is opened :
   (A) 20.6 ∟ - 74.05, 20.6∟ - 74.05, 0 (B) 20.6 ∟ - 74.05, 0, 0
   (C) 41.2 ∟ 90, 0, 0 (D) None of these

13. Which of the following relay is used on transformers ?
   (A) Buchholz relay (B) MHO relay
   (C) Distance relay (D) None of the above

14. Steady magnetic fields are governed by _____ law.
   (A) Biot - Savart's (B) Ampere's Circuital
   (C) Both (A) and (B) (D) None of these

15. The following is true :
   (A) A finite signal is always bounded
   (B) A bounded signal is always zero outside the interval $[-t_0, t_0]$ for some t_0
   (C) A bounded signal always possesses finite energy
   (D) A bounded signal is always infinite

16. The system characterized by the equation $y(t) = ax(t) + b$ is :
   (A) linear for any value of b (B) non - linear
   (C) linear if $b < 0$ (D) linear if $b > 0$

17. The impulse response of a system is $h(n) = a^n u(n)$. The condition for the system to be BIBO stable is :
(A) a is real and positive (B) $|a| < 1$
(C) a is real and negative (D) $|a| > 1$

18. The continuous time system described by $y(t) = x(t^2)$ is :
(A) causal, non - linear (B) non causal, linear
(C) non causal, non - linear (D) causal, linear

19. The region of convergence of the z-transform of the signal $2^n u(n) - 3^n u(-n-1)$:
(A) is $|z| > 1$ (B) is $2 < |z| < 3$
(C) is $|z| < 1$ (D) does not exist

20. The Fourier Transform of a rectangular pulse is :
(A) Another rectangular pulse (B) Triangular pulse
(C) Sinc function (D) Impulse

21. The open circuit test of a transformer gives information about :
(A) Core losses of the transformer (B) Cu losses of the transformer
(C) Both (A) and (B) (D) None of these

22. For a transformer which of the following connection is best suited for 3 phase, 4 wire service ?
(A) Star - delta (B) Delta - delta (C) Delta - star (D) Star - star

23. The typical value of turns ratio of a transformer used only for electrical isolation between two circuits can be :
(A) > 1 (B) < 1 (C) Less than 0.4 (D) Equal to unity

24. A transformer 4,000 kVA, 250 Hz is operated at 50 Hz. Its kVA rating should be revised to :
(A) 800 kVA (B) 10,000 kVA
(C) 4000 kVA (D) Cannot be revised

25. Among the following the transformer having largest size is :
(A) 250 kVA, 25 Hz (B) 250 kVA, 100 Hz
(C) 250 kVA, 50 Hz (D) 250 kVA, 60 Hz

26. Incorrect polarity of transformers during parallel operation of transformers will result in :
(A) Open circuit
(B) Dead short circuit
(C) Regeneration of power
(D) Power factor of transformer will be different from that of the connected load

27. For a transformer the all day efficiency primarily depends on :
(A) the amount of load (B) duration of load
(C) its copper loss (D) both (A) and (B)

28. If a D.C. motor is connected across the A.C. supply it will :
(A) run at normal speed
(B) not run
(C) run at lower speed
(D) burn due to heat produced in the field winding by eddy currents

29. D.C. motor would be preferred for conveyors :
(A) Series motor (B) Shunt motor
(C) Differentially compound motor (D) Cumulative compound motor

30. What will happen if the back e.m.f. of a D.C. motor vanishes suddenly ?
(A) The motor will stop (B) The motor will continue to run
(C) The armature may burn (D) The motor will run noisy

31. Ward - Leonard system of dc motor speed control is not recommended for :
(A) Very low speed (B) Frequent motor reversals
(C) Constant speed operation (D) Wide speed change

32. Among the following generators which one has poorest regulation ?
(A) series (B) shunt (C) long shunt (D) short shunt

33. For stable parallel operation shunt generators are most suitable because their voltage characteristics is :
(A) drooping (B) linear (C) rising (D) identical

34. Which winding will provide the higher e.m.f. for a D.C. generator when the number of poles and the number of armature conductors is fixed ?
(A) Wave winding
(B) Lap winding
(C) Depends on other features of design
(D) Either of (A) and (B) above

35. A single phase motor :
(A) Requires only one winding (B) Can rotate in one direction only
(C) Is not self starting (D) Is self starting

36. The current carried by the damper winding under normal running condition is :
(A) Zero (B) High (C) Low (D) Medium

37. For an alternator the power factor is determined by its :
(A) Speed (B) Prime mover (C) Excitation (D) Load

38. In a synchronous motor the maximum value of torque angle is :
(A) $< 90°$ electrical (B) $0°$ electrical (C) $> 90°$ electrical (D) $90°$ electrical

39. The detent torque in a stepper motor is the :
(A) minimum of the static torque with the phase winding excited
(B) maximum of the static torque with the phase winding over excited
(C) minimum of the static torque with the phase winding under excited
(D) maximum of the static torque with the phase winding unexcited

40. A synchronous generator is feeding a zero power factor (lagging) load at rated current. The armature reaction is :
(A) magnetizing (B) demagnetizing
(C) cross - magnetizing (D) ineffective

41. Negative sequence relay is commonly used to protect :
(A) a transformer (B) a transmission line
(C) a bus bar (D) an alternator

42. In a transmission line having a sending end voltage V, for a fixed value of complex power flow the real loss will be proportional to :
(A) V (B) V^2 (C) $\frac{I}{V}$ (D) $\frac{I}{V^2}$

43. The short, medium and long transmission lines is primarily based on the concept of :
(A) physical length of the line (B) wavelength of the line
(C) nominal voltage of the line (D) power transmitted over the line

44. In load flow analysis, the load connected at a bus is represented as :
(A) Constant current drawn from the bus
(B) Constant real and reactive power drawn from the bus
(C) Constant impedance connected at the bus
(D) Voltage and frequency dependent source at the bus

45. In the thermal power plants, the pressure in the working fluid cycle is developed by :
(A) turbine (B) super heater
(C) feed water pump (D) condenser

46. Advantage of using bundled conductors in transmission lines is to :
(A) reduce sag
(B) increase mechanical strength of the line
(C) reduce corona
(D) all of these

47. The major factor in the insulation strength of an EHV transmission line is :
(A) corona (B) switching over - voltages
(C) harmonics (D) load power factor

48. An open loop system represented by the transfer function $G(s) = \frac{(s-1)}{(s+2)(s+3)}$ is :
(A) Stable and of the non - minimum phase type
(B) Unstable and of non - minimum phase type
(C) Stable and of the minimum phase type
(D) Unstable and of the minimum phase type

49. The number of roots in the left half of s - plane for the equation, $s^3 - 4s^2 + s + 6 = 0$ will be :
(A) Zero (B) One (C) Two (D) Three

50. Transfer function of a lead compensator used for a closed loop controller is $\frac{K\left(1+\frac{s}{a}\right)}{\left(1+\frac{s}{b}\right)}$. For such a lead compensator :
(A) $a < Kb$ (B) $a > Kb$ (C) $a < b$ (D) $b < a$

51. As compared to a closed loop system an open loop system is :
(A) more stable as well as more accurate
(B) less stable as well as less accurate
(C) less stable but more accurate
(D) more stable but less accurate

52. In the G(s)H(s) plane the Nyquist plot of loop transfer function G(s)H(s) of a closed loop control system passes through the point $(-1, j0)$. The phase margin of the system is :
(A) 45° (B) 0° (C) 180° (D) 90°

53. The state variable description of a linear autonomous system is $X = AX$ where X is the two dimensional state vector and A is the system matrix given by $A = \begin{bmatrix} 0 & 2 \\ 2 & 0 \end{bmatrix}$. The roots of the characteristic equation are :
(A) -2 and -2 (B) -2 and $+2$ (C) $-j2$ and $+j2$ (D) $+2$ and $+2$

54. Signal flow graph is used to obtain :
(A) Controllability of the system (B) Stability of the system
(C) Transfer function of the system (D) Poles of the system

55. The damping ratio of a system having the characteristic equation $s^2+2s+8=0$ is :
(A) 0.300 (B) 0.330 (C) 0.353 (D) 0.250

56. An ammeter having internal resistance of 0.2Ω, has a current range of 0-5 A. In order to change the range to 0-25 A, we need to add a resistance of :
(A) 0.05 Ω in parallel with the meter
(B) 0.8 Ω in series with the meter
(C) 1.0 Ω in series with the meter
(D) 0.04 Ω in parallel with the meter

57. In a dynamometer type wattmeter the pressure coil is :
(A) Highly resistive (B) Highly inductive
(C) Purely resistive (D) Purely inductive

58. The Q-meter works on the principle of :
(A) series resonance (B) mutual inductance
(C) self inductance (D) parallel resonance

59. When a load of 450 W is connected, if an energy meter disc makes 10 revolutions in 100 seconds the meter constant (in rev/kWh) is :
(A) 1000 (B) 800 (C) 500 (D) 1600

60. In dc potentiometer measurements, a second reading is often taken after reversing the polarities of dc supply. This is to eliminate the effects of :
(A) Ripples in dc supply (B) Stray magnetic fields
(C) Stray thermal emf's (D) Erroneous standardisation

61. A low-pass filter with a cut-off frequency of 60 Hz is cascaded with a high pass filter with a cut-off frequency of 40 Hz. The resultant system of filters will function as :
(A) an all-pass filter (B) an all - stop filter
(C) a band stop (band-reject) filter (D) a band - pass filter

62. Circuit turn - off time of an SCR is defined as the time :
(A) taken by the SCR turn to be off
(B) required for the SCR current to become zero
(C) for which the SCR is reverse biased to reduce its current below the holding current
(D) for which the SCR is reverse biased by the commutation circuit

63. When is a voltage source inverter normally used ?
(A) Source inductance is large and load inductance is small
(B) Source inductance is large and load inductance is large
(C) Source inductance is small and load inductance is small
(D) Source inductance is small and load inductance is large

64. A single - phase fully controlled thyristor bridge ac - dc converter is operating at a firing angle of 25° and an overlap angle of 10° with constant dc output current of 20 A. The fundamental power factor (displacement factor) at input ac mains is :
(A) 0.827 (B) 0.866 (C) 0.78 (D) 0.9

65. HVDC transmission systems generally employ :
(A) 6 pulse converters (B) 3 pulse converters
(C) 12 pulse converters (D) either 12 or 6 pulse converters

66. Which of these commutation methods is used in AC-DC converters ?
(A) Class F (B) Class D (C) Class C (D) Class A

67. A single phase half wave rectifier circuit has a freewheeling diode which will conduct only if :
(A) load is combination of R and L
(B) load is purely inductive or combination of R and L
(C) load is purely resistive
(D) load is purely inductive

68. As compared to BJT, MOSFET has :
(A) higher switching losses and higher conduction losses
(B) lower switching losses and higher conduction losses
(C) higher switching losses and lower conduction losses
(D) lower switching losses and lower conduction losses

69. Which chopper circuit uses saturable reactor ?
(A) Morgan chopper (B) Auxiliary commutated
(C) Jones chopper (D) Load Commutated

70. The contents of the Accumulator, in an 8085 microprocessor, after the following instructions are executed will become :

XRA A
MVI B, $F0_H$
SUB B

(A) 10_H (B) 01_H (C) $0F_H$ (D) $F0_H$

71. In an 8085 A microprocessor based system, it is desired to increment the contents of memory location whose address is available in (D,E) register pair and store the result in same location. The sequence of instruction is :

(A) XCHG
INR M

(B) XCHG
INX H

(C) INX D
XCHG

(D) INR M
XCHG

72. A memory system has a total of 8 memory chips each with 12 address lines and 4 data lines. The total size of the memory system is :

(A) 64 k bytes (B) 48 k bytes (C) 32 k bytes (D) 16 k bytes

73. PSW in 8085 contains :

(A) accumulator (B) flags (C) either (A) or (B) (D) both (A) and (B)

74. Schmitt trigger is a comparator circuit with hysteresis, implemented by applying _____ to the non inverting input of a comparator or differential amplifier.

(A) negative feedback (B) zero feedback
(C) positive feedback (D) both (A) and (B)

75. An IGBT is a combination of :

(A) MOSFET and UJT (B) SCR and MOSFET
(C) MOSFET and BJT (D) None of these

76. Sample - and - hold circuits in analog - to digital converters (ADCs) are designed to :

(A) sample and hold the output of the binary counter during the conversion process
(B) stabilize the input analog signal during the conversion process
(C) sample and hold the D/A converter staircase waveform during the conversion process
(D) stabilize the comparator's threshold voltage during the conversion process

77. ACSR (Aluminium Conductor Steel Reinforced) are used as :
(A) super conductors
(B) over head transmission lines
(C) underground cables
(D) none of these

78. If δ is the loss angle of a cable, its power factor is :
(A) cosδ
(B) sinδ
(C) p.f. is independent of δ
(D) p.f. is dependent on δ but not as in (A) or (B)

79. For an EHV equipment for maintenance first it should be isolated and connected to ground because :
(A) to provide low impedance
(B) to discharge the charging capacitance to ground
(C) protection for operating personnel
(D) both (B) and (C)

80. For protecting from lightning surges which of the following devices can be used ?
(A) Lightning arresters
(B) Surge diverters
(C) Horn gap
(D) Any of the above

81. First widow remarriage was conducted by :
(A) Ayyankali
(B) Swami Vagbhatananda
(C) V.T. Bhattatirippadu
(D) Chattampi Swamikal

82. The first President who ordered that instead of "His Excellency" only "Sri" he prefixed to his name :
(A) A.P.J. Abdul Kalam
(B) K.R. Narayan
(C) Pratibha Patil
(D) Pranab Kumar Mukherjee

83. Sabarigiri Project is located in :
(A) Periyar (B) Pampa (C) Chalakudy (D) Muthirapuzha

84. Which was known as the first experiment of Gandhi in India ?
(A) Champaran Satyagraha
(B) Kheda Satyagraha
(C) Ahemadabad Mill strike
(D) Quit India Movement

85. Who was known as "Kerala Scott" ?
(A) Thakazhi
(B) Changampuzha
(C) M.T. Vasudevan Nair
(D) C.V. Raman Pillai

86. The famous Malayali Memorial was submitted on :
(A) 1891 (B) 1881 (C) 1897 (D) 1887

87. Founder of sarvodaya samajam :
(A) Veeresalingam (B) Subhash Chandra Bose
(C) Vinoba Bhave (D) Devendra Natha Tagore

88. The leader of revolt of 1857 in Kanpur :
(A) Kunwar Singh (B) Nana Saheb
(C) Bahadur Khan (D) Rani Lakshmibai

89. During Sangam age inhabitants of Mullai is known as :
(A) Idayar (B) Vettuvar (C) Meenavar (D) Uzhavar

90. The famous work "One hundred years of solitude" was written by :
(A) Arundhati Roy (B) Julian Barnes
(C) Gabriyel Garsia Markes (D) R.K. Narayan

91. The state in which "Vrindavan Chandrodaya Mandir" is proposed to be built is :
(A) Karnataka (B) Uttar Pradesh
(C) Madhya Pradesh (D) Maharashtra

92. Who among the following has become the first Indian Piston shooter to be rank no. 1 in the world ranking, recently :
(A) Anjali Bhagwat (B) Rani Sarnobat (C) Annu Raj Singh (D) Heena Sidhu

93. "Earth Hour" is a movement uniting people to protect the planet, organised by :
(A) UNESCO (B) World Wide Fund for Nature
(C) World Bank (D) World Trade Organisation

94. The revised Direct Tax code proposes to introduce tax slab for individuals earning more than ₹ 10 crore a year by taxing them at :
(A) 20% (B) 30% (C) 25% (D) 35%

95. "Panama Disease" or "Fusarium Wilt" is a most deadly disease related to which crop ?
(A) Banana (B) Cashew (C) Coconut (D) Mango

96. Study of Rocks is known as :
(A) Limnology (B) Pedology (C) Lithology (D) Postamology

97. Who elected with maximum majority in 2014 Loksabha Election from Kerala ?
(A) Jose K. Mani (B) E. Ahamed (C) P.K. Biju (D) Sasi Taroor

98. Which among the following countries is the largest supplier of arms to India in 2009 - 2013 ?
(A) USA (B) Japan (C) China (D) Russia

99. Minister for Foreign affairs is :
(A) Sushma Swaraj (B) Raj Nath Singh
(C) Najma Hepthulla (D) Arun Jately

100. Which year is considered as International year of Family Farming ?
(A) 2013 (B) 2012 (C) 2014 (D) 2011

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