TNEB ECE Model Question Paper 1

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1. Internal resistance of ideal current source is
   a)Zero **b)Infinite**
   c)Finite d)100 ohms
2. Kelvin's double bridge is used to measure low resistance because
   a)It has high sensitivity
   b)There is no thermoelectric emf
   c)Resistance variation due to temperature
   d)Effect of contact and lead resistance is eliminated
3. Nodal analysis can be applied for
   a)Planar networks
   b)Non planar networks
   c)Both planar and non planar networks
   d)Neither planar and non planar networks
4. A D-flip-flop is said to be transparent when
   a)The output is LOW
   b)The output is HIGH
   c)The output follows clock
   d)The output follow input
5. If a pure inductor is connected across the ac source, the average power taken by the inductor
   a)A few watt b)100 watt
   c)Zero watt d)Maximum power
6. Bundled conductors in EHV transmission lines
   a)Increase inductance
   b)Increase capacitance
   c)Decrease inductance
   d)Decrease capacitance
7. The alternative names for active power is/are
   a)Real power b)Average power
   c)True power **d)All of the above**
8. The D'Arsonval movement can be converted into audio frequency ac ammeter by adding a
   a)Thermocouple
   b)Transducer
   c)Chopper
   d)Rectifier
9. Assertion(A) : Schering bridge is a low voltage bridge
   Reason(R): Schering bridge is very commonly used for measurement of capacitance
   a)Both A and R are true and R is correct explanation of A
   b)Both A and R are true but R is not correct explanation of A
   c)A is true R is false
   d)A if false R is true
10. DC machine windings are
    a)Full pitched b)Short pitched
    c)Either of these d)None of the above
11. In a lap winding dc machine number of conductors are 100 and number of parallel paths are 10. Find the average pitch
    a)10 b)100
    c)50 d)1

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12. India's largest thermal power station is located at
a)Kota b)Sarni
c)Chandrapur d)Neyveli

13. MICR stands for
a)Magnetic Ink Chart Receipt
b)Magnetic Ink Character Recognition
c)Magnetic Ink Chart Recognition
d)Magnetic Ink Character Receipt

14. The filter that may not be realized by approximation of derivatives techniques are
1)Band pass filters 2)High pass filters
3)Low pass filters 4)Band reject filters
a)1,2 and 3 are correct
b)2and4are correct
c)2 and 3 are correct
d)All the four are correct

15. A transmission line has a reactance of 1 Pu is operating at $V_s=V_r=1$Pu. The generator is connected at source end which is delivering 0.5 Pu of active power. Find the load angle?
a)35^0 **b)30^o**
c)45^o d)60^0

16. Under over excitation synchronous phase modifier works as
a)Shut capacitor b)Series capacitor
c)Shunt capacitor d)Any of the above

17. For n bus power system size of Y bus matrix is
a)(n-1)*(n-1) b)(n-2)*(n-2)
c)n*n d)(n-1)(n-2)

18. A20m antenna gives a certain uplink gain at frequencies of 4/6 GHz. For getting same gain in the 20/30 GHz band, antenna size required is meter
a)100 **b)4**
c)1 d)10

19. Sum of the elements of row I equal to shunt admittances connected to bus i. If this summation is zero, indicates there is no
a)Shunt admittance b)Mutual coupling
c)Both 1 & 2 d)None of the above

20. If sparsity of a bus 5 bus transmission line is 0.4. Find the number of transmission lines?
a)6 **b)5**
c)4 d)3

21. Inductor does not allow the sudden change of
a)Current b)Voltage
c)Power d)None of the above

22. 2's complement of 10101011 is
a)01010101 b)00111100
c)10101011 d)10101100

23. Which ionization layer exists during day time & usually vanishes at night due to highest recombination rate?
a)D-region
b)Normal E-region
c)Sporadic E-region
d)Appleton region

24. 8085 has 6 sign flags
a)True b)False

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25. Which addresses are related to the processes involved in an application layer of TCP/IP architecture?
    a)Physical (link)Addresses
    b)Logical (IP)addresses
    c)Port addresses
    d)Specific addresses
26. JCOKE =3
    JCOKE =JCOKE +1
    GO TO (5,8,9,11,15,16,18,20) JCOKE
    After the execution of above statement, the control is transferred to stamen number
    a)8
    b)11
    c)16
    d)20
27. Which type of node comprises incoming as well as outgoing branches?
    a)Source node b)Sink node
    c)Chain node d)Main node
28. On the basis of an output response, in to how many parts can the s-plane be divided?
    a)2 **b)3**
    c)4 d)6
29. Dynamic equalizing circuit is useful
    a)To limit di/dt of SCR
    b)To limit dV/dt of SCR
    c)For Voltage equalization
    d)Both B &C
30. For Carrier Sense Multiple Access/ Collision Detection(CSMA/CD), we need a restriction on the
    a)Collision Size b)Signal size
    c)Frame size d)Station size
31. An SCR has cycle surge current rating of 3000 A for 50Hz supply. One cycle surge current will be
    a)1500A b)6000A
    c)2121.32A d)2131.43A
32. If holding current of a thyristor is 2 mA then latching current should be
    a)0.01A b)0.002A
    c)0.009A **d)0.004A**
33. Which is not the internal circuit of operational amplifier?
    a)Differential amplifier
    b)Level translator
    c)Output driver
    d)Clamper
34. Power transistor are type of
    a)BJT_s b)$MOSFET_S$
    c)$IGBT_s$ **d)All of the above**
35. Which among the following is an application of high frequency?
    a)SONAR
    b)Subsurface communication
    c)Radio navigation
    d)Facsimile
36. Which semi conductor device acts like a diode and two transistor?

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a)UJT b)Diac
c)Triac d)SCR

37. Which quantity consists of a unit 1Kwh?
a)Energy b)Time
c)Power d)Charge

38. Which number system has a base of 16
a)Decimal b)Octal
c)Hexadecimal d)None

39. In ward-Leonard system, the lower limit of the speed imposed by
a)Field resistance
b)Armature resistance
c)Residual magnetism of the generator
d)None of the above

40. At which angles does the front to back ratio specify an antenna gain?
a)0^o & 180^0 b)90^o & 180^0
c)180^0 & 270^0 d)180^0 & 360^0

41. Which logic family provide minimum power dissipation
a)TTL b)CMOS
c)ECL d)JFET

42. Convert the binary number(1111000011110000) to hexadecimal number
a)1010 **b)F0F0**
c)7070 d)5050

43. Why generic array logic (GAL) device was invented?
a)Mask programmable
b)One time programmable
c)Reprogrammable
d)None of the above

44. Which of the following logic circuits is the fastest?
a)RTL
b)DTL
c)TTL
d)All have same speed

45. The Nyquist theorem for sampling
a)Relates the conditions in time domain and frequency domain
b)Helps in quantization
c)Limits the bandwidth requirement
d)Gives the spectrum of the signal
a)1,2 and 3 are correct
b) 1and 2 are correct
c)1 and 3 are correct
d)All the four are correct

46. The cooley –Tukey algorithm of FFT is a
a)Divide and conquer algorithm
b)Divide and rule algorithm
c)Split and rule algorithm
d)Split and combine algorithm

47. The similarity between the fourier transform and the Z transform is that
a)Both convert frequency spectrum domain to discrete time domain
b)Both convert discrete tie domain to frequency spectrum domain
c)Both convert analog signal to digital signal

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d)Both convert digital signal to analog signal

48. The region of convergence of x/(1+2x+x2) is

a)0 **b)1**

c)Negative d)Positive

49. The direct form II for realization involves

1)The realization of transfer function in to two parts

2)Realization after fraction

3)Product of two transfer functions

4)Addition of two transfer functions

a)1.2 and 3 are correct

b)1 and 3 are correct

c)3 and 4 are correct

d)All the four are correct

50. Which among the following is a disadvantage of modern control theory?

a)Implementation of optimal design

b)Transfer function can also be defined for different initial conditions

c)Analysis of all systems take place

d)Necessity of computational work

51. State space analysis is applicable even if the initial conditions are___

a)Zero **b)Non zero**

c)Equal d)Not equal

52. How does the crosstalk generated due to the electromagnetic interference between two copper wires placed in vicinity get reduced?

a)By twisting the copper wire

b)By using the repeaters

c)By using amplifiers

d)All of the above

53. Spread time is defined as the interval during which

a)Anode voltage drops from 10% of its initial value to zero

b)Anode current rises from 90% to its final value

c)Both a and b

d)Anode current rises from 10% to 90% of its final value

54. What is/are the major roles of Data Link Layer(DLL) in an OSI model?

a)Detection & correction of transmission errors

b)Provision of data flow control to prevent DTE from overburdening

c)Identification of various devices on the network

d)Generation of a frame for easy data transfer

a)A,B,C,D b)Only C

c)Only D d)None of the above

55. In a transmitter___ oscillator is used

a)Hartley b)RC phase shift

c)Wien – bridge **d)Crystal**

56. Over modulation (amplitude) occurs when signal amplitude is ___ carrier amplitude

a)Equal to **b)Greater than**

c)Less than d)None of the above

57. Which among the following is provided by and optical receiver for the regeneration of data signal with minimum error?

a)Photo –Diode

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b)Signal processing Circuits

c)Linear Circuitry

d)None of the above

58. The speech signal is obtained after

a)Analog to digital conversion

b)Digital to analog conversion

c)Modulation

d)Quantization

59. In an optical fiber, the concept of Numerical aperture is applicable in describing the ability of ___

a)Light collection b)Light Scattering

c)Light Dispersion d)Light Polarization

60. Which among the following is regarded as an inelastic scattering of a photon?

a)Kerr effect **b)Raman effect**

c)Hall effect d)Miller effect

61. Three points (x_r, y_r) r = 1, 2, 3 are collinear if and only if the rank of the matrix $\begin{bmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{bmatrix}$ is

1) 3 **2) less than 3**

3) greater than 3 4) 32

62. The eigen values of an orthogonal matrix A are positive. What is the value of |A|?

1) 1 2) -1

3) 2 4) 3

63. At the point (4, 0) the function f (x, y) = $x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$ attains

1) Maximupi 2) Minimum

3) Saddle 4) None of these

64. The minimum value of $x^2 + y^2 + 6x + 12$ is

1) 2 **2) 3** 3) 20 4) 25

65. Stationary points of $x^2 + y^2 + 6x + 12$ is

1) (1, 2) 2) (3, 4)

3) (-3, 0) 4) (-4, -3)

66. If $\bar{V} = \bar{w} \times \bar{r}$, $\bar{w}$ is a constant vector and $\bar{r} = x\bar{i} + y\bar{j} + z\bar{w}$ then $\bar{w}$ is

1) 0 **2) $\frac{1}{2}$ curl $\bar{v}$**

3) div $\bar{r}$ 4) 1

67. If $\bar{r} = x\bar{i} + y\bar{j} + z\bar{k}$, then $\nabla \times (\nabla r^n) =$

1) 0 2) 1 3) 2 4) 3

68. The vector $\bar{F} = yz\bar{i} + zx\bar{j} + xy\bar{k}$

1) If rotational 2) solenoidal

3) 0 4) 1

69. Complete integral of $p = e^q$ is

1) $z = ax + e^a y + c$

2) $z = ax + 2y + c$

3) z = ax + y log a + c

4) None of these

70. Form the partial differential equation from log (az - 1) = x + ay + b

1) (p + 1) (q+1) = zpq

2) p (q + 1) = zq

3) q (p+1) = zp

4) pq (p+1) = zpq

71. Particular integral for $(D^2 - 4D + 4)\ y = \cos 2x$ is

1) $\frac{\sin 2x}{4}$ **2) $\frac{-\sin 2x}{8}$**

3) $\frac{\cos 2x}{8}$ 4) 0

72. Find the particular Integral for $(D^3-1)\ y = x^{2x}$

1) $\frac{e^{2x}}{5}$ 2) $\frac{e^{2x}}{6}$

3) $\frac{e^{2x}}{7}$ 4) $\frac{e^{2x}}{9}$

73. A square matrix A is nilpotent of order n if

1) $A^n = 0$ 2) $A^{n+1} = 0$

3) $A^n = A$ 4) $A^{2n} = 1$

74. If $A = \begin{bmatrix} 3 & 5 & 3 \\ 0 & 4 & 6 \\ 0 & 0 & 1 \end{bmatrix}$ then the eigen values of A^{-1}

1) $\frac{1}{3}, \frac{1}{4}, 1$ 2) $\frac{1}{5}, \frac{1}{4}, 1$

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3) $\frac{1}{6}, \frac{1}{5}, \frac{1}{3}$ 4) None of these

75. The moment generating function of the poisson distribution about x=0 is
1) e^t **2) $e^{\lambda(e^t-1)}$**
3) 1 4) 0

76. If X is a poisson variate such that P(X=1)=0.3 and P(X=2) = 0.2. Then $E(X^2)$
1) $\frac{28}{9}$ 2) $\frac{4}{3}$
3) $\frac{16}{9}$ 4) 0.63

77. The "three sigma" (3σ) value associated with the random variable X with normal distribution implies that the probability for X to be between -3σ and +3σ is
1) 0.683 2) 0.965
3) 0.511 **4) 0.997**

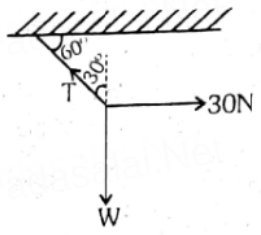
78. Solution of $(D^2 + 4)\, y = \sin 3x$
1) $y = A \cos 2x + B \sin 2x$
2) $y = A \cos x + B \sin x + \frac{\sin 3x}{5}$
3) $y = A \cos 2x + B \sin 2x - \frac{\sin 3x}{5}$
4) $y = \frac{\sin 3x}{5} + A \cos x + B \sin 3x$

79. Particular Integral of $(D^2 + D + 1)\, y = \sin 2x$ is
1) $\frac{3 \sin 2x}{15}$ 2) $\frac{-2 \cos 2x}{13}$
3) $\frac{-2 \cos 2x}{13} - \frac{3 \sin 2x}{13}$ 4) $\frac{e^{4x}}{2}$

80. Particular integral for $(D^2 - 3D^2 + 4D - 2)\, y = e^x$
1) xe^x 2) $2xe^x$
3) $3xe^x$ 4) 0

81. 9. An object is moving with a velocity $v=5 + 2t^2$ ms^{-1} for 't' seconds. Find the average acceleration for the first 5s and the acceleration of the object at t = 3s
1) 5 ms^{-2}, 6 ms^{-2} **2) 10 ms^{-2}, 15 ms^{-2}**
3) 7 ms^{-2}, 9 ms^{-2} 4) 12 ms^{-2}, 20 ms^{-2}

82. The shown in figure, the tension in the horizontal cord in 30N. The weight 'w' and tension in the string OA in Newton's are



1) $30\sqrt{3}$, 30 **2) $30\sqrt{3}$, 60**
3) $60\sqrt{3}$, 60 4) none of the above

83. A solid can be resist of the following stresses.
1) Tensil 2) Shear
3) Compressive **4) All of the above**

84. When a pressure of 20.7 MN/m^2 is applied to 100 litres of a liquid its volume decreases by 1 litre. Find the bulk modulus of the liquid and identify this liquid
1) 2 GN/m^2 2) 2.007 GN/m^2
3) 2.07 GN/m^2 4)None of the above

85. _____is a phenomenon by which a liquid rises into a thin glass tube above or below its general level.
1) Adhesion 2) Capillary
3) Surface tension **4) Cohesion**

86. The height of the free surface above any point is known as
1) static head
2) intensity of pressure
3) either of the above
4) none of the above

87. Information involved in any operation performed by the CPU needs to be addressed such information is called the
1) Operand 2) Operation
3) Address 4) none

88. Operand is in a memory location whose address is in the memory location specified in the instruction
1) Memory Indirect Mode
2) Relative Mode
3) Indexed Mode
4) Memory Direct Mode

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89. The resistance of a straight conductor does not depend on its
1) shape of cross-section
2) length
3) temperature
4) material

90. Current density (J) = ……
1) $\frac{q}{tA}$ 2) $\frac{1}{A}$
3) Both (1) and (2) 4)Neither(1) nor (2)

91. The resistance of a conductor with a diameter of 2mm is 20 ohms. If the diameter is doubled with length remaining the same, the new resistance, becomes
1) 10 ohms 2) 40 ohms
3) 5 ohms 4) 30 ohms

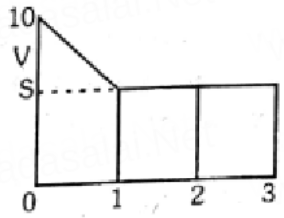
92. A 20m length of wire 1.5 mm in diameter has a resistance of 2.5Ω. What is the resistance of a 35m length of wire 3mm in diameter made of the same material?
1) 10.94Ω **2) 1.094Ω**
3) 0.547 Ω 4) 2.184Ω

93. Materials which show zero resistance are called
1) super conductors
2) electrolytic conductors
3) dielectrics
4) semi conductors
Joule's heating effect is zero.

94. If the temperature of a conductor is decreased below its critical temperature T_c, the value of critical magnetic field H_c will
1) decrease
2) increase
3) remain constant
4) may increase (or) decrease

95. Dielectric loss in ferrites is
1) very high **2) very low**
3) zero 4) none of these

96. The given figure shows the variation of force in an elementary system which undergoes a process during which the plunger position changes from 0 to 3m. If the internal energy of the system at the end of the process is 2.53 higher then the heat absorbed during the process is



1) 15J **2) 20J** 3) 5J 4) 30J

97. A diesel engine theoretically operates on
1) constant volume cycle
2) constant pressure cycle
3) constant temperature cycle
4) constant entropy cycle

98. In all reversible process, entropy of the system
1) increases
2) decreases
3) remains the same
4) none of the above

99. The time duration for which a sound persists even after the source of sound is cut off is called
1) Reverberation time
2) Standard reverberation time
3) Decibel
4) bel

100. The ratio of velocity of sound in air at 4 atmosphere pressure and that at one 1 atmosphere pressure would be
1) 1:1 2) 4:1
3) 1:4 4) 3:1