Southern Junior Lineman Exam
Model Paper 9

Electrical Engineering

1. Magnetism is mainly due to only electron spin around their axis in case of

1. Diamagnetic materials
2. Paramagnetic materials
3. Ferromagnetic materials
4. Paramagnetic and Diamagnetic materials

2. For Paramagnetic materials, the relative permeability is

1. Less than unity but magnetic susceptibility is relatively small and positive
2. greater than unity and magnetic susceptibility is relatively small but positive
3. equal to unity and magnetic susceptibility is relatively large but positive
4. Less than unity but magnetic susceptibility is relatively large and positive

3. Permalloy and Mumetal are examples of

1. Silicon and iron alloys
2. Nickel and iron alloys
3. Cobalt and iron alloys
4. Permanent magnetic materials

4. When a ferromagnetic substance is magnetized, the phenomenon of 'magnetostriction' causes

1. Increase in the body temperature
2. Change in the permeability of the substance
3. Small change in its dimensions
4. Decrease in the saturation flux-density

5. The resistivity of 'Ferrites' is very much higher than that of ferromagnetic metals, because

1. Ferrites are chemical compounds and the electrons in them are subject to restraint of valence forces
2. Ferrites have a low eddy current loss
3. Ferrites have a non-homogeneous molecular structure
4. Ferrites have varying flux-density inside the core

6. When the temperature exceeds the transition temperature, a ferromagnetic material becomes similar to

1. Anti- ferromagnetic material
2. Diamagnetic material
3. ferrimagnetic material
4. paramagnetic material

7. A magnetic ring has a mean circumference of 20cm and a cross-section of 20cm^2 and has 800 numbers of turns of wire. When the exciting current is 5 A, the flux is 2 mWb. The relative permeability of iron is nearly

1. 3.98
2. 398
3. 0.398
4. 39.8

8. The voltage and current waveforms for an element are shown in the figures:
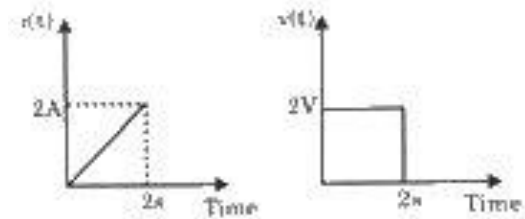
The circuit element and its value are

1. Capacitor and 2F
2. Inductor and 1H
3. Inductor and 2H
4. Resistor and 1Ω

9. For a series R-C circuit, the power factor corresponding to maximum power is

1. 0.5 lag
2. 0.5 lead

3. 0.707 lead

4. 0.707 lead

10. The power consumed by a coil is 300W when connected to a 30V dc source and 108W when connected to a 30V ac source. The reactance of the coil is

1. 3 Ω

2. 4 Ω

3. 5 Ω

4. 6.67 Ω

11. When a source is delivering maximum power to a load, the efficiency of the circuit is always

1. 50%

2. 75%

3. 100%

4. Depends on the circuit parameters

12. Consider the following statements: Any element connected in

1.Series with an ideal current source is redundant.

2.Parallel with an ideal current source is redundant.

3.Series with an ideal voltage source is redundant.

4.Parallel with an ideal voltage source is redundant.

Which of the above statements are correct?

1. 1 only

2. 2 and 3

3. 2 only

4. 1 and 4

13. Wagner's earthing device is used in A.C. bridges for

1. Shielding the bridge elements

2. Eliminating the stray electrostatic field effects

3. Eliminating the effect of earth capacitance

4. Eliminating the effect of inter-component capacitances

14. A bridge circuit works at a frequency of 2kHz. The following can be sued as detectors for detection of null conditions on the bridge

1. Vibration galvanometers and Headphones

2. Headphones and tunable amplifiers

3. Vibration galvanometers and Tunable amplifiers

4. Vibration galvanometers, Head-phones and Tunable amplifiers

15. A current transformer has a phase error of +3°. The phase angle between the primary and secondary currents is

1. 3°

2. 177°

3. 180°

4. 183°

16. Electronic voltmeters which use rectifiers employ negative feedback. This is done

1. To increase the overall gain

2. To improve the stability

3. To overcome the non-linearity of diodes

4. To increase the bandwidth

17. Creep error may occur in induction type energy meter due to

1. Incorrect position of brake magnet

2. Incorrect adjustment of position of shading band

3. Overvoltage across voltage coil

4. Increase in temperature

18. An 8-bit successive approximation DVM of 5V range is used to measure 1.2 V. The contents of SAR after 5 clock pulses is

1. 01010000

2. 00111100

3. 00111000

4. 00110111

19. How many machine cycles are required by STA instruction?

1. 2

2. 3

3. 4

4. 5

20. Which of the following instructions is closest match to the instruction POP PC?

1. RET
2. PCHL
3. POP PSW
4. DAD SP

21. LOADER is a program that

1. Loads the mnemonics and generates a hex file
2. Loads the hex file and converts to the executable file
3. Loads the COM file and generates the binary code
4. Loads English like command and generates the binary code

22. Direct-Memory-Access channel (DMA) facilitates data to move in and out of the system

1. On first-come-first-serve basis
2. With equal time delay
3. Without a sub-routine
4. Without programme intervention

23. The address lines A_{15} to A_9 of microprocessor with 64 K memory capacity are connected to the chip select line of a 512 × 8 EPROM through an AND gate. Its memory map ranges from 0000 to

1. 00FF
2. 03FF
3. 02FF
4. 01FF

24. A device or a peripheral equipment which is not in direct communication with CPU of a computer is called

1. Offline device
2. 03FF
3. Active device
4. Slow device

25. If the α value of a transistor changes 0.5% from its nominal value of 0.9, the percentage change in b will be

1. 0%
2. 2.5%
3. 5%
4. 7.5%

26. If an npn silicon transistor is operated at V_{CE} = 5 V and I_C = 100 μA and has a current gain of 100 in the CE connection, then the input resistance of this circuit will be

1. 250 Ω
2. 25 kΩ
3. 250 kΩ
4. 2500 kΩ

27. In a bipolar junction transistor an increase in magnitude of collector voltage increases the space-charge width at the output junction diode. This causes the effective base width to decrease. This effect is known as

1. Hall effect
2. Early effect
3. Miller effect
4. Zener effect

28. Which type of protection is provided for SCR by connecting the snubber circuit across it?

1. $\frac{dv}{dt}$ protection
2. $\frac{di}{dt}$ protection
3. Over-voltage protection
4. Over-current protection

29. When the photo resist coating (during IC fabrication) is exposed to ultraviolet light the photo resist becomes

1. Oxidized
2. Ionized
3. Polymerized
4. Brittle

30. The concentration of hole-electron pairs in pure silicon at T = 300 K is 7×10^{15} per cubic metre. Antimony is doped into silicon in a proportion of 1 atom in 10^7 atoms. Assuming that half of the impurity atoms contribute electrons in the conduction band, the factor by which the number of charge carriers increase due to doping (the number of silicon atoms per cubic metre is 5×10^{28}) is

1. 14×10^{15}
2. 0.5×10^{21}
3. 2.5×10^{21}
4. 1.8×10^5

31. The CE short circuit current gain, β of a transistor

1. Is a monotonically increasing function of the collector current, I_C
2. Is a monotonically increasing function of I_C
3. For low values of I_C, it increases and reaches a maximum then decreases with further increase in I_C
4. Is not a function of I_C

32. The electrical resistivity of many metals and alloys drops suddenly to zero when they are current of 5 A at an angle of 30° lagging. The readings of the two wattmeters W1 and W2 used for measuring the power drawn by the circuit, are respectively

1. 2000 W and 1000 W
2. 1500 W and 1500 W
3. 2000 W and 1500 W
4. 1500 W and 1000 W

33. For forward biased diode

1. Transition capacitance is larger than diffusion capacitance
2. Diffusion capacitance is larger than transition capacitance
3. Both capacitance are having same value
4. Cannot predict with certainty

34. Consider to following steps in the fabrication of a monolithic bipolar junction transistor:
1. Emitter diffusion

2. Base diffusion

3. Buried layer formation

4. Epi-layer formation

What is the correct sequence of these steps?

1. 1, 2, 3 and 4
2. 4, 2, 3 and 1
3. 1, 3, 2 and 4
4. 4, 3, 2 and 1

35. In a *p-n* junction diode under reverse bias, the magnitude of electric field is maximum at

1. The edge of the depletion region on the *p* side
2. The edge of the depletion region on the *n* side
3. The *p-n* junction
4. The center of the depletion region on the *n* side

36. Consider the following statements regarding a differential amplifier using an FET pair. The differential output offset voltage is due to:
1. Mismatch between FET parameters

2. Difference between the values of resistors used in the circuit even though they are marked nominally equal.

3. Variation in the operating voltage of the circuit.

Which of the above statements are correct?

1. 1, 2 and 3
2. 2 and 3 only
3. 1 and 3 only
4. 1 and 2 only

37. As compared to an LLED, LCD has the distinct advantage of

1. Extremely low power consumption
2. Providing a silver display

3. Being extremely thin

4. Giving two types of displays

38. System transformation function H(z) for a discrete time LTI system expressed in state variable form with zero initial condition is

1. e(zI - Z)$^{-1}$ b+d

2. e(zI - A)$^{-1}$

3. (zI - A)$^{-1}$ z

4. (zI - A)$^{-1}$

39.Given a unity feedback system with

$$G(s)=\frac{k}{s(s+6)}$$ **, the value of K for damping ratio of 0.75 is**

1. 1

2. 4

3. 16

4. 64

40. Z and Laplace Transform are related by

1. $s = \ln z$

2. $s = \frac{\ln z}{T}$

3. $s = z$

4. $s = \frac{T}{\ln z}$

41. Convolution of two sequences X$_1$[n] and X$_2$[n] is represented as

1. X$_1$[z] * X$_2$[z]

2. X$_1$[z] . X$_2$[z]

3. X$_1$[z] + X$_2$[z]

4. X$_1$[z] / X$_2$[z]

42. Consider the following statements:
1.The Laplace Transform of the unit impulse function is s × Laplace Transform of the unit ramp function.

2.The impulse function is a time derivative of the ramp function.

3.The Laplace Transform of the unit impulse function is s × Laplace Transform of the unit step function.

4.The impulse function is a time derivative of the step function.

Which of the above statements are correct?

1. 1 and 2 only

2. 3 and 4 only

3. 2 and 3 only

4. 1, 2, 3 and 4

43. Consider the following statements: Fourier series of any periodic function X(t) can be obtained if

1. $\int_0^1 [x(t)]dt < \infty$

2.Finite number of discontinuous exists within finite time interval t.

Which of the above statements are correct?

1. 1 only

2. 2 only

3. Both 1 and 2

4. Neither 1 nor 2

44. A transfer function has its zero in the right half of the s-plane. The function

1. Is positive real

2. Is minimum phase

3. Will give stable impulse response

4. Is non-minimum phase

45. If the s-plane contour encloses 3-zeros and 2-poles of q(s), the corresponding q(s) plane contour will encircle the origin of q(s) plane

1. Once in clockwise direction

2. Once in counter clockwise direction

3. Thrice in clockwise direction

4. Twice in counter clockwise direction

46. What is the effect of lag compensator on the system bandwidth and the signal-to-noise ratio?

1. Bandwidth in increased and signal-to-noise ratio is improved
2. Bandwidth in increased and signal-to-noise ratio is deteriorated
3. Bandwidth in reduced and signal-to-noise ratio is deteriorated
4. Bandwidth in reduced and signal-to-noise ratio is improved

47. The angle between two adjacent asymptotes in a root locus diagram is

1. $\dfrac{\pi}{n+m}$

2. $\dfrac{2\pi}{n+m}$

3. $\dfrac{\pi}{n-m}$

4. $\dfrac{2\pi}{n-m}$

48. The response y(t) of a linear system to an excitation x(t)=e^{-3t}u(t) is y(t)=(2t + 1)e^{-2t}u(t) Poles and zeros will be at

1. -1, -1 and -2, -2
2. -2, -2 and -3, -4
3. -3, -3 and -4, -5
4. None of these

49. A network has a transfer function

$$H(s)=\frac{V(s)}{I(s)}=\frac{2s+5}{s+2}$$

If the current *i(t)* is a unit step function, the steady-state value of *v(t)* is given by

1. 0
2. 2.5 A
3. 2 A
4. Infinity

50. Short circuit test is performed on a transformer with a certain impressed voltage at rated frequency. If the short circuit test is now performed with the same magnitude of impressed voltage, but at a frequency higher than the rated frequency, then the magnitude of current:

1. And power factor will both increase
2. Will decrease but the power factor will increase
3. Will increase, but the power factor will decrease
4. And power factor will both decrease

51.The impedance of Δ/Y, 11000 V/400 V, transformer of capacity 100 kVA, on its name plate data base is (0.02 + j0.07) p.u. The ohmic impedance p.u phase referred to the primary (11000 V) side is:

1. (0.02 + j 0.07) Ω
2. (0.55 + j 1.925) Ω
3. (42 + j 147) Ω
4. (72.6 + j 254.1) Ω

52. A 50 kVA transformer has a core loss of 500 W and full-load core loss of 900 W. The load at which the efficiency is maximum is:

1. 27.45 kVA
2. 37.75 kVA
3. 45.5 kVA
4. 47.5 kVA

53. For a two-winding power transformer, with the effects of the no-load current being neglected, the 'Voltage Regulation' can be zero at load, when the load power-factor is:

1. Lagging only
2. Leading only
3. Either lagging or leading, depending upon power rating of the transformer
4. Unity

54. The ratio of primary/secondary voltages is 2 : 1. The savings in terms of weight of copper required if an auto transformer is used instead of a two-winding transformer will be:

1. 95%
2. 66.7%
3. 50%

4. 33.3%

55. Consider the following statements concerning the utility of mesh-connected tertiary windings in star-star transformers:

1.It is used to suppress harmonic voltages

2.It is used to allow flow of earth fault current for operation of protective devices

3.If facilitates supply of single-phase loads

4.It provides low-reactance paths for zero sequence currents
Which of these statements are correct?

1. 1, 2, 3 and 4

2. 1, 2 and 3 only

3. 1, 2 and 4 only

4. 3 and 4 only

56.The radiation shield for a nuclear power reactor for biological safety is provided by having the reactor:

1. Immersed in water pool

2. Encased by thick metal walls

3. Encased by thick concrete walls

4. Isolated from outside world with strong magnetic fields

57. A 'Pumped storage hydro-electric-plant' consist of:

1. A synchronous machine and a multistage centrifugal pump in one shaft

2. A synchronous machine, a reaction turbine, and a multistage centrifugal pump all in one shaft

3. An induction generator, a synchronous machine and a reaction turbine all in one shaft

4. An induction generator, a synchronous machine, and a multistage centrifugal pump all in one shaft

58. The economics of power plant is greatly influenced by:

1.Load factor

2.Utilization factor

3.Unit capacity

4.Type of load

1. 1, 2, 3 and 4

2. 1, 3 and 4

3. 1, 2 and 3

4. 2, 3 and 4

59. Match List-I and List-II and select the correct answer using the code given below the lists:
List-I
A.Thyrite arrester
B.Sag template
C.Cable sheaths
D.Circuit breaker

List-II
1.Tower location
2.Cross bonding
3.Restriking voltage
4.Non-linear resistor

	A	B	C	D
1.	3	1	2	4
2.	4	1	2	3
3.	3	2	1	4
4.	4	2	1	3

60. The incremental fuel costs for two generating units G_1 and G_2 are given by: $IC_1 = 25 + 0.2 PG_1$ and $IC_2 = 32 + 0.2 PG_2$ where PG_1 and PG_2 are real powers generated by the units. The economic allocation for total of 250 MW, neglecting transmission loss, is given by

1. $PG_1 = 142.5$ MW and $PG_2 = 107.5$ MW

2. $PG_1 = 109.75$ MW and $PG_2 = 140.25$ MW

3. $PG_1 = 125$ MW and $PG_2 = 125$ MW

4. $PG_1 = 100$ MW and $PG_2 = 150$ MW

61. The main objective of load frequency controller is to apply control of:

1. Frequency alone

2. Frequency and at the same time of real power exchange via the outgoing lines

3. Frequency and at the same time of reactive power exchange via the outgoing lines

4. Frequency and bus voltages

62. A line commutated phase-controlled inverter is operating at its inverter limit. There can be a commutation failure is

1. The frequency decreases

2. The voltage increases

3. The frequency increases

4. Both voltage and frequency change such that v/f is constant

63. A single phase, voltage source, square wave inverter feeds a pure inductive load. The waveform of the current will be

1. Sinusoidal

2. Rectangular

3. Trapezoidal

4. Triangular

64. The characteristic impedance of a transmission line depends upon

1. shape of the conductor

2. surface treatment of the conductor

3. conductivity of the material

4. geometric configuration of the conductor

65. Superconductivity in a material can be destroyed by

1. increasing the temperature above a certain limit.

2. applying a magnetic field above a certain limit.

3. passing a current above a certain limit.

4. decreasing the temperature to a point below the critical temperature

Which of the above are correct?

1. 1 and 2 only

2. 2 and 3 only

3. 1, 2 and 3 only

4. 1, 2, 3 and 4

General Knowledge

66. The first Anglo Burmese War was concluded by a treaty which one among the folloiwgn is that

1. Treaty of Bharma

2. Treaty of Tamu

3. Treaty of Bhamo

4. Treaty of Yandanboo

67. Match List-I with List-II and select the correct answer using the code given below the List

	List-I	List-II
A.	Third Carnatic War Sablai	1. Treaty of
B.	Third Mysore War Lahor	2. Treaty of
C.	First Maratha War Paris	3. Treaty of
D.	First Anglo Sikh war Sriangapatam	4. Treaty of
E.		

1. 2 1 4 3

2. 2 4 1 3

3. 3 4 1 2

4. 3 1 4 2

68. Which of the following events symbolised the fall of autocracy during the course of French Revolution?

1. Mass execution by the Guillotine in 1792

2. The meeting of the States General on 17th June , 1789

3. Execution of the king and the Queen

4. The fall of Bastille on 14th July 1789

69.Which one of the following countries has the longest international boundary with India?

1. Bangladesh
2. Bhutan
3. China
4. Pakistan

70. Winds blow:

1. From a region of high pressure to a region of low pressure
2. In regions of low pressure
3. In region of high pressure
4. From a region of low pressure to a region of high pressure

71. During which Five Year Plan was the annual growth rate of National Income the lowest

1. 2nd plan
2. 3rd plan
3. 5th plan
4. 6th plan

72. Consider the following statements

1. The Constitution of the United States of America came into force in year 1810.

2. All revenue bills must originate in the House of Representative of the US Congress.

3. George W Bush is the only President in the history of the United States of America.

Which of the statements(s) given above is/are correct?

1. Only 1
2. Only 2
3. 1 and 2
4. 2 and 3

73. Where is the 100 pillar temple located ?

1. Nizamabad
2. Hanmakonda
3. Medak
4. Karimnagar

74. The Dandora Movement was launched for the purpose of

1. Sub-classification of Scheduled Castes
2. Sub-classification of Scheduled Tribes
3. Sub-classification of the most Backward classes
4. Abolition of Caste based reservation

75. Which district in Telangana has the highest number of cement factories ?

1. Warangal
2. Khammam
3. Nalgonda
4. Nizamabad.

76. Ferromagnetic materials used in a transformer must have

1. low permeability and high hysterisis loss

2. high permeability and low hysterisis loss

3. high permeability and high hysterisis loss

4. low permeability and low hysterisis loss

77. The best method for the conversion of an alcohol into an alkyl chloride is by treating the alcohol with

1. PCl_3

2. PCl_3

3. $SOCL_2$ in presence of pyridine

4. dry HCl in the presence of anhydrous $ZnCl_2$

78. Bryophytes resemble algae is the following aspects

1. Filamentous body, presence of vascular tissues and autotrophic nutrition

2. Differentiation of plant body into root, stem and leaves and autotrophic nutrition

3. Thallus like plant body, presence of roots and autotrophic nutrition

4. Thallus like plant body, lack of vascular tissues and autotrophic nutrition

3. Rafael Nadal

4. Novak Djokovic

79. Who has won the 2022 Mexican Open Tennis Tournament ?

1. Alexander Zverev

2. Danil Medvedev

80. Which of the following won the Khelo India Women's Hockey League (U-21) on 30 March 2022 ?

1. Raja Karan Hockey Academy

2. Madhya Pradesh Hockey Academy

3. Pritam Siwach Hockey Academy

4. Har Hockey Academy

Model paper 9 key

Electrical Engineering

1.3, 2.2, 3.2, 4.3, 5.1, 6.4, 7.3, 8.3, 9.4, 10.2, 11.1, 12.4, 13.2, 14.2, 15.2, 16.4, 17.2, 18.3, 19.3, 20.1, 21.2, 22.4, 23.4, 24.1, 25.3, 26.2, 27.2, 28.1, 29.3, 30.3, 31.3, 32.1, 33.2, 34.4, 35.3, 36.3, 37.1, 38.3, 39.3, 40.2, 41.2, 42.2, 43.3, 44.4, 45.1, 46.3, 47.4, 48.2, 49.2, 50.4, 51.4, 52.2, 53.2, 54.3, 55.1, 56.3, 57.2, 58.1, 59.2, 60.1, 61.2, 62.3, 63.4, 64.4,65.3

General Knowledge

66.4, 67.3, 68.3, 69.1, 70.1, 71.2, 72.2, 73.1, 74.1, 75.3, 76.2, 77.2, 78.4, 79.3, 80.3