

TS Southern Junior Lineman Exam Model Paper 2

Electrical Engineering

1. In order to generate a square wave from a sinusoidal input signal, one can use

1. Schmitt trigger circuit
2. Clippers and amplifiers
3. Monostable multivibrator

Which of the above statements are correct?

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

2. Variation in β in a BJT can cause a fixed bias circuit to go

1. Into active mode of operation from saturation mode
2. Out of active mode
3. Out of saturation
4. Into cutoff mode from active mode of operation

3. A dual-beam CRO

1. Has one set of vertical deflection plates
2. Has two sets of horizontal deflection plates
3. Has two separate electron beams
4. None of the above

4. A unity feedback system has open-loop transfer function $G(s) = \frac{k(s+4)}{(s+1)(s+2)}$

The portions of the real axis that lie on the root loci are between

1. $s = -2$ and $s = -4$; $s = -1$ and $+\infty$
2. $s = -1$ and $s = -2$; $s = -4$ and $-\infty$

3. $s = 0$ and $s = -2$; beyond $s = -4$

4. $s = 0$ and $s = -1$

5. Consider Fourier representation of continuous and discrete-time systems. The complex exponentials (i.e. signals), which arise in such representation have

1. Same properties always
2. Different properties always
3. Non-specific properties
4. Mostly same properties

6. In a voltage-series-feedback amplifier with open loop gain A_V , and the feedback factor β , the input resistance becomes

1. $\frac{R_i}{(1+\beta A_V)}$
2. $R_i \sqrt{(1+\beta A_V)}$
3. $R_i(1+\beta A_V)$
4. $\frac{R_i}{\sqrt{(1+\beta A_V)}}$

7. In a discrete-time Low Pass filter, the frequency response is

1. Aperiodic
2. Aperiodic with response restricted to $(-\omega_c + \omega_c)$
3. Periodic with period 2π
4. Quasi periodic with response extending to infinity

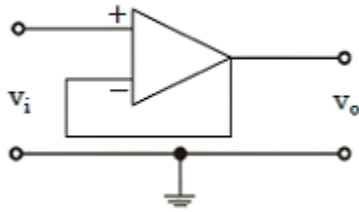
8. The power transmission capability of bipolar lines is approximately

1. Half that of 3-phase single circuit line
2. Same as that of 3-phase single circuit line

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3. Twice that of 3-phase single circuit line
4. Thrice that of 3-phase single circuit line

9. The operational amplifier circuit shown in figure having a voltage gain of unity has



1. High input impedance and high output impedance
2. High input impedance and low output impedance
3. Low input impedance and low output impedance
4. Low input impedance and high output impedance

10. The theorem which states that in any linear, non-linear, passive, active, time-variant, time-invariant network, summation of instantaneous power is zero will be called as

1. Tellegen's theorem
2. Compensation theorem
3. Reciprocity theorem
4. Superposition theorem

11. Time response of an indicating instrument is decided by which of the following systems?

1. Mechanical system provided by pivot and jewel bearing
2. Controlling system
3. Deflecting system
4. Damping system

12. An integrator type DVM (digital voltmeter) contains a 100 Ω and 1 capacitor. If the voltage

applied to the integrator input is 1 volt, what voltage will be present at the output of the integrator after 1 second?

1. 1.1 V
2. 1 V
3. 10 V
4. 100 V

13. Consider the following statements regarding an N-P-N Bipolar Junction Transistor:

1. Emitter diode is forward biased and collector diode is reverse biased
2. Emitter has many free electrons
3. Free electrons are injected into base and pass through collector
4. Depletion layers around junction J1 and J2 of BJT are widened

Which of the above statements are correct?

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

14. Modified McMurray full-bridge inverter works on:

1. Voltage commutation
2. Current commutation
3. Load commutation
4. Complementary commutation

15. XCHG instruction of 8085 exchanges the content of

1. Top of stack with contents of register pair
2. BC and DE register pairs
3. HL and DE register pairs
4. None of the above

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16. Direction flag is used with

1. String instructions
2. Stack instructions
3. Arithmetic instructions
4. Branch instructions

17. A generating station has 500 MW maximum demand and annual load factor of 50%, capacity factor of 40%. The reserve capacity of the plant is

1. 125 MW
2. 625 MW
3. 500 MW
4. 725 MW

18. The first element of each of the rows of a Routh-Hurwitz stability test showed the signs as follows:

Row	I	II	III	IV	V
Sign	+	+	-	+	-

Consider the following statements:

1. The system has three roots in the right-half of s-plane.
2. The system has three roots in the left-half of s-plane.
3. The system is stable.
4. The system is unstable.

Which of the above statements about the system are correct?

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

19. The internal characteristics of a dc generator is plotted between the

1. Field current and voltage generated at no load
2. Armature current and voltage generated at no load
3. Armature current and voltage generated after armature reaction
4. Field current and voltage generated on load

20. In measuring resistance by voltmeter-ammeter method, the voltmeter can be connected either across supply or across the resistance. If the resistance is low, the voltmeter should be connected

1. Across the supply
2. Across the resistance
3. Either across the supply or across the resistance
4. Neither across the supply nor across the resistance

21. Thermal runaway is not possible in FET because, as the temperature of FET increases

1. The drain current increases
2. The mobility of charge carriers decreases
3. The mobility of charge carriers increases
4. The transconductance increases

22. Consider two nodes A and B connected by an impedance of $j5 \text{ W}$. If the voltages at nodes A and B are $100\angle 30^\circ \text{ V}$ and $100\angle 0^\circ \text{ V}$ respectively, the real power that can be transferred from node A to B is

1. 2000 W
2. 1000 W
3. 2769 W
4. 276.9 W

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23. A 4 kVA transformer has iron-loss of 200 W and full load copper loss of 200 W. The maximum efficiency at unity power factor will be

1. 90.9%
2. 85.6%
3. 80.6%
4. 70.9%

24. A bridge circuit works at a frequency of 2 kHz. Which of the following can be used as detectors for detection of null conditions in the bridge?

1. Vibration galvanometers and headphones
2. Headphones and tunable amplifiers
3. Vibration galvanometers and tunable amplifiers
4. Vibration galvanometers, headphones and tunable amplifiers

25. Which of the following can produce maximum induced voltage?

1. 1 A d.c. current
2. 50 A d.c. current
3. 1 A, 60 Hz a.c. current
4. 1 A, 490 Hz a.c. current

26. Permanent magnet loses the magnetic behaviour when heated because of

1. atomic vibration
2. dipole vibration
3. realignment of dipoles

Which of the above are correct?

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

27. The temperature above which an anti-ferromagnetic material becomes paramagnetic is called

1. Peak temperature
2. Neel temperature
3. Critical temperature
4. Weiss temperature

28. The characteristic equation of a closed-loop system is $s^2 + 4s + 16 = 0$. The natural frequency of oscillation and damping constant respectively are

1. 2 rad/s and $\frac{1}{2}$
2. $2\sqrt{3}$ rad/s and $\frac{1}{\sqrt{3}}$
3. 4 rad/s and $\frac{1}{2}$
4. 4 rad/s and $\frac{1}{\sqrt{2}}$

29. Compared to turbines in conventional coal-fired thermal stations, nuclear power plant turbines use steam at

1. Lower pressure and temperature
2. higher pressure and temperature
3. Lower pressure and higher temperature
4. higher pressure and lower temperature

30. Consider the following statements with respect to Routh-Hurwitz criterion:

1. It can be used to determine relative stability
2. It is valid only for real coefficients of the characteristic equation
3. It is applicable only for non-linear systems.
4. It does not provide the exact location of closed-loop poles in left-or-right half of s-plane.

Which of the above statements are correct?

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

31. To interface a slow memory, wait states are added by

1. Extending the time of the chip select logic
2. Causing READY signal to go low
3. Causing READY signal to go high
4. By increasing the clock frequency

32. Which of the following is called 'hot carrier diode'?

1. PIN diode
2. LED
3. Photo diode
4. Schottky diode

33. In dc machines, the field-flux axis and armature-mmf axis are respectively along

1. Direct axis and indirect axis
2. Direct axis and inter-polar axis
3. Quadrature axis and direct axis
4. Quadrature axis and inter-polar axis

4. Which one of the following properties is not observed in the carbon nanotubes?

1. High stiffness and strengths
2. Low densities
3. Unusual electrical property
4. Non-ductile

35. A periodic function satisfies Dirichlet's conditions. This implies that the function

1. Is non-linear
2. Is not absolutely integrable
3. Guarantees that Fourier series representation of the function exists
4. Has infinite number of maxima and minima within a period

36. A dc motor running at 2000 rpm has a hysteresis loss of 500 W and eddy-current loss of 200 W. The flux is maintained constant but the speed is reduced to 1000 rpm. At the reduced speed the total iron-loss would be

1. 500 W
2. 400 W
3. 300 W
4. 200 W

37. If a system produces frequencies in the output that are not present in the input, then the system cannot be

1. Minimum phase system
2. Linear shift invariant
3. Stable and causal
4. Stable and linear

38. Let $u[n]$ be the unit-step signal $x[n] = (\frac{1}{2})^n u[n] + (-\frac{1}{3})^n u[n]$. The region of convergence of z-transform of $x[n]$ is

1. $|z| > \frac{1}{3}$
2. $\frac{1}{3} < |z| < \frac{1}{2}$
3. $|z| > \frac{1}{2}$
4. $|z| < \frac{1}{2}$

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39. For a four variable K-map, if each cell is assigned one integer value in range 0 – 15 then which is the cells adjacent to the cell corresponding to decimal value 7?

1. 3, 5, 6 and 8
2. 3, 5, 10 and 11
3. 3, 5, 6 and 15
4. 4, 6, 8 and 15

40. Damper bars in case of Salient Pole Rotors of hydro-alternators are usually inserted in pole faces to

1. Strengthen the excitation current of the poles
2. Damp out the rotor oscillations during transient state owing to sudden change in load conditions
3. Help improve the power factor of the load
4. Reduce the no-load current when load is thrown-off

41. The chief deterrent to the widespread application of superconducting materials is

1. Very difficult to form, machine or case
2. The difficult in attaining and maintaining extremely low temperature
3. The poor strength-to-weight ratio
4. The lower oxidation rate at elevated temperatures

42. The evidence for the importance of electron-phonon interaction in super-conductors comes from

1. Meissner effect
2. Josephson effect
3. Isotope effect
4. Flux quantization experiments

43. Which one of the following materials is used for cable insulation?

1. Phenol formaldehyde
2. Polytetrafluoroethylene
3. Polyvinyl chloride
4. Acrylonitrile butadiene styrene

44. For high speed reading and storing of information in a computer, the material used is

1. Ferrite
2. Piezoelectric
3. Pyroelectric
4. Ferromagnetic above 768°C

45. The Thevenin equivalent voltage and resistance across AB shown in the figure respectively are



1. 5 V and 5 Ω
2. 25 V and 3 Ω
3. 35 V and 2 Ω
4. 25 V and 5 Ω

46. The theorem which states that in any linear, non-linear, passive, active, time-variant, time-invariant network, summation of instantaneous power is zero will be called as

1. Tellegen's theorem
2. Compensation theorem
3. Reciprocity theorem
4. Superposition theorem

47. Transients are cause because

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1. The load is suddenly connected to or disconnected from the supply

2. Of the sudden change in applied voltage from one finite value to the other

3. Of the change in stored energy in inductors and capacitors

Which of the above statements are correct?

- 1 and 2 only
- 1 and 3 only
- 2 and 3 only
- 1, 2 and 3

48. For neat wiring and 250 volts supply, the cables will be placed _____ a part centre to centre for single core cables.

- 4.5 cm
- 2.5 cm
- 3 cm
- 4 cm

49. If the bandwidth of an oscilloscope is 10 MHz, what is the fastest rise time a square wave can have to be accurately reproduced by the instrument?

- 10 ns
- 35 ns
- 28 ns
- 100 ns

50. At the beginning of a Fetch cycle, the contents of the program counter are

- Incremented by one
- Transferred to address bus
- Transferred to memory address register
- Transferred to memory data register

51. What will be the contents of DE and HL register pairs respectively after the execution of the following instructions?

LXIH, 2500H

LXID, 0200H

DAD D

XCHG

- 0200H, 2500H
- 0200H, 2700H
- 2500H, 0200H
- 2700H, 0200H

52. Each instruction in an assembly language program has the following fields

- Label field
- Mnemonic field
- Operand field
- Comment field

What is the correct sequence of these fields?

- 1, 2, 3 and 4
- 2, 1, 4 and 3
- 1, 3, 2 and 4
- 2, 4, 1 and 3

53. A tunnel-diode is best suited for

- Very low frequencies
- 50 Hz
- 100 Hz
- Microwave frequencies

54. Small recovery time of a diode is most significant for

- Line-frequency rectification
- Switching operations
- High-frequency rectifications and switching operations
- Low-frequency rectifications and switching operations

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55. In JFET, when operated above the pinch-off voltage, the

1. Depletion region becomes smaller
2. Drain current starts decreasing
3. Drain current remains practically constant
4. Drain current increases steeply

56. A freewheeling diode T phase controlled rectifier

1. Improves the line power factor
2. Enables inverse operation
3. Is responsible for additional reactive power
4. Is responsible for additional harmonics

57. A semiconductor differs from a conductor in that it has

1. Only one path for the free electrons in the valence band
2. Only one path for holes in the conduction band
3. Two paths followed by free electrons and holes, one an ordinary path in the conduction band and the other one an extraordinary path in the valence band, respectively
4. Two paths followed by free electrons and holes, one an extraordinary path in the conduction band and the other one an ordinary path in valence band, respectively .

58. Consider an LTI system subjected to a wide-sense stationary input $\{x(n)\}$, which is a white noise sequence. The cross correlation $\phi_{xy}[m]$ between input $x(n)$ and output $y(n)$ is Where $\phi_{xx}[m] = \sigma_x^2 \delta[m]$ and $h[.]$ is impulse response

1. $\sigma_x^2 h[m]$
2. $\sigma_x h[m]$
3. $\frac{\sigma_x^2}{2} h[m]$
4. $\frac{\sigma_x}{2} h[m]$

59. Consider the following input and system types:

Input	System Type
Unit step	Type '0'
Unit ramp	Type '1'
Unit parabolic	Type '2'

Which of the following statements are correct?

1. Unit step input is acceptable to all the three types of system.
2. Type '0' system cannot accept unit parabolic input.
3. Unit ramp input is acceptable to Type '2' system only.
 1. 1 and 2 only
 2. 1 and 3 only
 3. 2 and 3 only
 4. 1, 2 and 3

60. A uniformly distributed winding on the stator has three full-pitched coils, each coil having N turns and each turn carrying a current L. The mmf produced by this switching is

1. Sinusoidal in waveform with an amplitude $3 NI$
2. Sinusoidal in waveform with an amplitude $3 \frac{NI}{2}$
3. Trapezoidal in waveform with an amplitude $3 NI$
4. Trapezoidal in waveform with an NI amplitude $3 \frac{NI}{2}$

61. A shunt motor supplied at 250 V, runs at 900 rpm and the armature current drawn is 30 A. The resistance of the armature circuit is 0.4 Ω . The resistance required in series with the armature to reduce the speed to 600 rpm when the armature current is 20 A will be

1. 3.17 Ω
2. 217 Ω

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3. 5.17 Ω
4. 4.17 Ω

62. The thermal and electrical efficiencies of a 100 MW steam station are respectively 30% and 92%. The coal used has a calorific value of 6400 kcal/kg. For the supply of full-load rated capacity the coal consumption in kg/hour would be approximately

1. 24340
2. 32450
3. 48690
4. 64910

63. The term 'Surge Tank' is associated with which type of power plant?

1. High head hydro
2. Low head hydro
3. medium head hydro
4. thermal

64. In a McMurray inverter, diodes are connected in inverse parallel to thyristors to

1. Protect the thyristor
2. Make the turn off of the thyristor successful
3. Make the turn on of the thyristor successful
4. Provide path to the reactive component of the load current.

Which of the above statements are correct?

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

65. In the slice processing of an integrated circuit

1. components are formed in the areas where silicon dioxide remains

2. components are formed in the areas where silicon dioxide has been removed
3. the diffusing elements diffuse through silicon dioxide
4. only on diffusion process is used

General Knowledge

66. Who was the first European to translate the Bhagwad Gita into English

1. William Jones
2. Christopher Hill
3. Charles Wilkins
4. Sir Aleacander Cunningham

67. The Asiatic Society was established in Calcutta

1. Warren Hastings
2. Sir William Jones
3. Raja Ram Mohan Rai
4. T.B. Macaulay

68. When did the Second World War end?

1. 1918
2. 1939
3. 1945
4. 1946

69. The southern most point of peninsular India, that is, Kanyakumari, is:

1. north of Tropic of Cancer
2. south of the Equator
3. south of the Capricorn
4. north of the Equator

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70. In USA, which one of the following regions receives heavy rainfall throughout the year under the influence of Westerlies?

1. North-western
2. North-eastern
3. South-western
4. South-eastern

71. Kurukshetra a journal on rural development is published by

1. Ministry of Finance
2. Ministry of Information and Broadcastin
3. Ministry of Rural Development
4. Planning Commission

72. Consider the following statements

1. Part IX of the Constitution of India provisions for Panchayats and was inserted by the Constitution (Amendment) Act, 1992.
2. Part IX A of the Constitution of India contains provisions for municipalities and the Article 243 Q envisages two types of municipalities_ a Municipal Corporation for every State.

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

1. Only 1
2. Only 2
3. Both 1 and 2
4. Neither 1 nor 2

73. "TelanganaPallePragathi" project was launched in the Village of

1. Kowdipally, Medak District
2. Erravalli, Medak District
3. Mulkanoor, Karimnagar District
4. Chevella, Rangareddy District

74. Name of the Bank founded by the last Nizam of Hyderabad Mir Osman Ali Khan is

1. Nizam State Bank
2. Hyderabad Provincial Bank
3. Hyderabad Commerical Bank
4. Hyderabad State Bank

75. Who consturcted the 'Masaheba' tank in Hyderabad ?

1. Hayat Bakshi Begum
2. KhananBakshi Begum
3. Ameena Bibi
4. Meherunnis

76.A direct current / flows along the length of an infinitely long straight thin walled pipe, then the magnetic field is

1. uniform throughout the pipe not zero
2. zero only along the axis of the pipe
3. zero at any point inside the pipe
4. maximum at the Centre and minimum at the edge

77. In the electrolysis of acidulated water, it is desired to obtain 1.12 cc of hydrogen per second under STP condition. The current to be passed is

1. 1.93 A
2. 9.65 A
3. 19.3 A
4. 0.965 A

78. Which of the following is not a green-house gas?

1. Water vapour
2. Carbon monoxide

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3. Methane
4. Oxygen

79. What does 'S' Stand for in 'SWIFT' Financial messaging service ?

1. Secure
2. Society
3. Simple
4. Service

80. Which section of Railways has completed 100 per cent electrification across the Zone ?

1. Konkan Railway
2. North East Frontier Railway
3. East Coast Railway
4. South Central Railway

Model paper 2 key

Electrical Engineering

1.3, 2.2, 3.3, 4.2, 5.1, 6.3, 7.3, 8.2, 9.2 10.1, 11.4, 12.3, 13.4,14.2, 15.3, 16.1, 17.1, 18.2, 19.3, 20.2, 21.2, 22.2, 23.1, 24.1, 25.4,26.3, 27.2, 28.3, 29.1, 30.3, 31.2, 32.4, 33.2, 34.4, 35.3, 36.3, 37.2,38.3, 39.3, 40.2, 41.2, 42.4, 43.3, 44.1, 45.3, 46.1, 47.4, 48.2, 49.2,50.3, 51.4, 52.1, 53.4, 54.3, 55.3, 56.1, 57.3, 58.1, 59.1, 60. 2, 61.4, 62.3, 63.1, 64.3, 65.1

General Knowledge

66.3, 67.2, 68.3, 69.4, 70.1, 71.2, 72.1, 73.1, 74.4, 75.2, 76.3, 77.3, 78.4, 79.2, 80. 1