01. A pn junction diode dynamic conductance is directly proportional to
(a) The applied voltage
(b) The temperature
(c) Its current
(d) The Thermal Voltage

02. The output impedance of a BJT under common-collector configuration is
(a) low
(b) high
(c) medium
(d) very high

03. The voltage gain of a given common source JFET amplifier depends on its
(a) input impedance
(b) amplification factor
(c) dynamic drain resistance
(d) drain load resistance

04. The increase in value of β of transistor can cause the fixed bias circuit to
(a) shift from saturation region
(b) shift the operation from active mode to saturation mode
(c) shift the operation from saturation mode to cutoff mode
(d) shift the operation from cutoff mode to active mode

05. In case of amplifiers, which coupling gives the highest gain?
(a) Transformer coupling
(b) Resistance coupling
(c) impedance coupling
(d) capacitance coupling

06. The Barkhausen criterion for sustained oscillation is given by
(a) $A\beta = 1$ (b) $|A\beta| \geq 1$
(c) $|A\beta| < 1$ (d) $\angle A\beta = 180°$

07. A negative feedback amplifier with open-loop gain $\frac{-A_0}{1+j\frac{\omega}{\omega_0}}$; $A_0 > 0$ and feedback factor β (>0) will have a 3 dB cut – off at what frequency ?
(a) $\omega_0 A_0 \beta$ (b) $\omega_0 (1+A_0\beta)$
(c) $\frac{\omega}{(1+A_0\beta)}$ (d) $\omega_0 (1-A_0\beta)$

08. Class AB operation is often used in power (large signal) amplifier in order to
(a) get maximum efficiency
(b) remove even harmonics
(c) overcome cross – over feedback
(d) reduce collector dissipation

09. What is the octal equivalent of $(5621.125)_{10}$?
(a) 11774.010 (b) 12765.100
(c) 16572.100 (d) 17652.010

SSC-JE

PRELIMS & MAINS

And also, Useful For RRB-JE & State Service Commissions / State PSUs / Etc.,

PROGRAMS OFFERED

- CLASSROOM COACHING
- POSTAL COACHING
- ONLINE/OFFLINE TEST SERIES

STREAMS : **Civil, Mechanical & Electrical**

- @ Hyderabad : 10th May
- @ Delhi : 10th June
- @ Pune : 10th June
- @ Kolkata : 15th June

Early Bird Discount:
Get 15,000/- OFF
Register on or before
31st March 2020

* Note: Medium of instruction : (Hyderabad- English) (Delhi, Pune, Kolkata - Hindi + English)

Online Test Series

No. of Tests : 20

Subject Wise Tests	16
Full Length Mock Tests	4

POSTAL COACHING

10. Which code is used for identification of cells in k-map?
(a) BCD code (b) excess-3 code
(c) Hamming code (d) Gray code

11. The number of comparators needed in a 4-bit flash-type A/D converter is
(a) 32 (b) 15 (c) 8 (d) 4

12. The third order polynomial system $P(s) = a_1s^3 + a_2s^2 + a_3 s + a_0$ is stable, if :
(a) $a_2a_0 > a_1a_3$ (b) $a_2a_3 < a_0a_1$
(c) $a_2a_0 < a_1a_3$ (d) $a_2a_3 > a_0a_1$

13. Principle of argument is the basis for
(a) Compensation using bode plots
(b) Compensation using pole-placement
(c) Nyquist criterion
(d) R-H criterion

14. For DC voltage, inductor behaves as
(a) open circuit (b) short circuit
(c) Voltage source (d) current source

15. If four 10 μF capacitors are connected in parallel, the net capacitance is
(a) 2.5 μF (b) 40 μF (c) 20 μF (d)15 μF

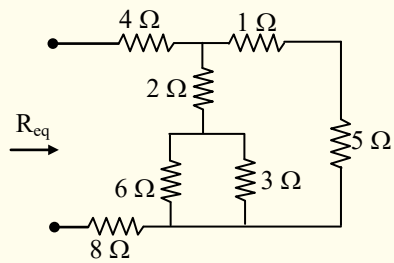
16. Two wires A and B of the same material but of different lengths L and 2L have the radius r and 2r respectively. The ratio of specific resistance will be
(a) 1 : 8 (b) 1 : 1 (c) 1 : 2 (d) 1 : 4

17. A 20 micro Farad capacitor is connected across an ideal voltage source. The current in the capacitor
(a) None of these true.
(b) Will be zero at first, and then exponentially rise
(c) Will be very high at first, and then exponentially decay.
(d) Will be very high at first, and then exponentially decay and at steady state will become zero

18. Two resistors of 3Ω and 5 Ω in parallel are connected to a dc supply of 15 V. If the 3 Ω resistor is short circuited, then theoretically the supply current is:
(a) 3 A (b) 5 A
(c) infinity (d) 0

19. A pulse of+10V in magnitude and 2s in duration is applied to the terminals of a lossless inductor of 1.0H. the current through the inductor would
(a) Be a pulse of +20A for the duration of 2s
(b) Be a pulse of –20A for the duration of 2s
(c) increase linearly form zero to 20A in 2s, and in the positive direction, and, from thereon, it remains constant at +20A
(d) increase linearly form zero to–20A in 2s, and in the negative direction, and, from thereon, it remains constant at –20A.

20. The R_{eq} for the circuit shown in figure is



(a) 14.4 Ω (b) 14.57 Ω
(c) 15.27 Ω (d) 15.88 Ω

21. The material to be used in the manufacture of a standard resistor should be of
(a) Low resistivity
(b) High resistivity and low temperature coefficient
(c) High temperature coefficient
(d) Low resistivity and high temperature coefficient

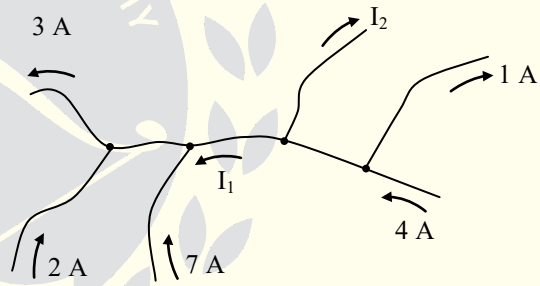
22. The time rate of change of a voltage applied across a 1 μF capacitor is 2V/s. This means that the current flowing through the capacitor is
(a) 2×10^{-6} A (b) 2 A
(c) 0.5×10^{-6} A (d) 0.5 A

23. The energy capacity of a storage battery is rated in
(a) kWh (b) kW
(c) Ampere hours (d) Joules

24. Energy stored in a capacitor over a cycle, when excited by an ac source is
(a) the same as that due to a dc source of equivalent magnitude.
(b) half of that due to a dc source of equivalent magnitude
(c) zero
(d) none of the above

25. The number of turns of a coil having a time constant T is doubled. Then the new time constant will be
(a) T (b) 2T
(c) 4T (d) T / 2

26. Find currents I_1 and I_2 for circuit shown below are



(a) $I_1 = 6A, I_2 = 9A$
(b) $I_1 = 6A, I_2 = -9A$
(c) $I_1 = -6A, I_2 = -9A$
(d) $I_1 = -6A, I_2 = 9A$

27. A sinusoidal voltage waveform has frequency 50Hz and RMS voltage 30V. The equation representing the waveform is
(a) V = 30 sin50t
(b) V = 60 sin20t
(c) V = 42.42 sin314t
(d) V = 84.84 sin314t

28. For a series resonant circuit, at the half power points, which of the following is true?
(a) Current is half of the current at resonance
(b) Resistance is equal to the reactance
(c) The impedance is half the impedance at the resonance
(d) None of the above

29. In a series RL circuit, the voltage across the resistance is 40V and voltage across inductance is 40V. Then the total voltage across the series circuit is
(a) 40V (b) 56.56V
(c) 80V (d) 5.656V

30. What is the value of R so that i = 2A?

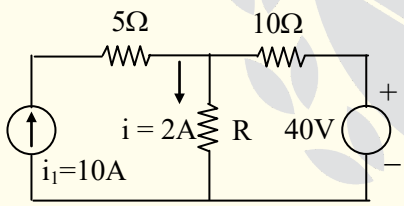


Fig.

(a) 5 Ω (b) 10 Ω
(c) 40 Ω (d) 60 Ω

31. If impedance of an ac circuit is given by Z = (3 – j2)Ω, then the respective values of conductance and susceptance in mho are:
(a) $\frac{2}{13}, \frac{3}{13}$ (b) $\frac{2}{13}, -\frac{3}{12}$
(c) $\frac{3}{13}, \frac{2}{13}$ (d) $\frac{3}{13}, -\frac{2}{13}$

32. An RLC series circuit has a resistance R of 20Ω and a current which lags behind the applied voltage by 45°. If the voltage across the inductor is twice the voltage across the capacitor, what is the value of inductive reactance?
(a) 10 Ω (b) 20 Ω
(c) 40 Ω (d) 60 Ω

33. A magnetic material has a total flux ϕ of 80 μWb with an mmf of 160 AT. The reluctance in ampere turn per Weber is.
(a) 2×10^{-6} (b) 2×10^{6}
(c) 2×10^{-8} (d) 2×10^{8}

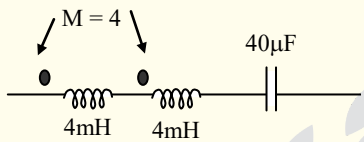
34. The lagging of flux density behind the applied magnetising force is known as
(a) Permeance (b) Flux
(c) Hysteresis (d) All of the above

35. The attraction capacity of electromagnet will increase if the
(a) Core length increases
(b) Core area increases
(c) Flux density increases
(d) Flux density decreases

36. The value of electric field at a distance of 1 m from an infinite line charge density of 1C/m is
(a) $2\pi\varepsilon_0$ (b) $\frac{1}{2\pi\varepsilon_0}$
(c) $\frac{\varepsilon_0}{2\pi}$ (d) $\frac{2\pi}{\varepsilon_0}$

37. For static fields which of the following is invalid.
(a) $\nabla \times \vec{E} = 0$ (b) $\nabla . \vec{B} = 0$
(c) $\nabla \times \nabla \times \vec{H} = \sigma \vec{E}$ (d) $\nabla . \vec{D} = 0$

38. Find the resonant frequency in the below circuit (in rad/sec)



(a) 1250 (b) 1000
(c) 1562.5 (d) 1500

39. An emf of 16 V is induced in a coil of inductance 4 H. The rate of change of current must be
(a) 64 A/s (b) 32 A/s
(c) 16 A/s (d) 4 A/s

40. Which of the following can induce the maximum induced voltage?
(a) 1 amp DC (b) 1 amp, 1 Hz AC
(c) 1 amp, 100 Hz AC (d) 20 amp DC

41. Which of the following materials possesses the least resistivity?
(a) Iron (b) Mangnin
(c) Aluminum (d) Copper

42. Given two coupled inductors L_1 and L_2 having their mutual inductance M. The relationship among them must satisfy
(a) $M > L_1L_2$ (b) $M < L_1L_2$
(c) $M = L_1L_2$ (d) $M > \frac{L_1L_2}{2}$

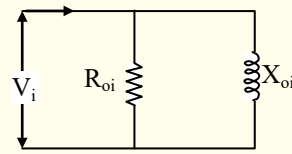
43. If $\bar{E} = 5$ V/m for an air medium, what is the value of H?
(a) $\frac{5}{120\pi}$ A/m (b) $5 \times 120\pi$ /m
(c) $\frac{5}{60\pi}$ A/m (d) $5 \times 60\pi$ A/m

44. Voltage applied across a ceramic dielectric produces an electrostatic field 100 times greater than in air. The dielectric constant of the ceramic equals_____ .
(a) 100/3 (b) 50
(c) 100 (d) 1/100

45. Internal heating of capacitor is usually attributed to
(a) Dielectric charge (b) Plate vibration
(c) Electron movement (d) Leakage resistance

46. In a transformer fed from a fundamental frequency voltage source, the source of harmonics is the
(a) overload (b) poor insulation
(c) iron loss (d) saturation of core

47. At which condition of the transformer the equivalent circuit will be as shown below?



(a) Under short circuit
(b) Under rated load
(c) Under open circuit
(d) Under load and no load

ACE® Engineering Academy

Leading Institute for ESE/GATE/PSUs

24 Years of Excellence Since 1995

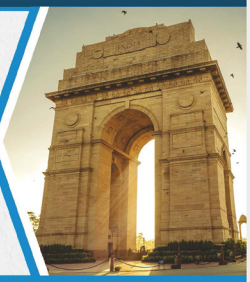
48 ALL INDIA 1st RANKS IN GATE

15 ALL INDIA 1st RANKS IN ESE

Hyderabad | Ahmedabad | Pune | Delhi | Bhubaneswar | Bangalore | Chennai | Lucknow | Visakhapatnam | Vijayawada | Tirupati | Kolkata

Head Office Address: # 4-1-1236/1/A, Sindhu Sadan, King Koti, Abids, Hyderabad – 500001, Telangana, India.

SUMMER



SHORT TERM BATCHES GATE + PSUs - 2021

@ HYDERABAD

Streams: EC, EE, ME, CE, CSIT, IN & PI

28th April, 5th May,
10th May, 17th May, 25th May,
1st June, 8th June, 2020

Course Duration: 55 to 60 Days

040-23234418/19/20, 040-24750437

hyderabad@aceenggacademy.com

@ DELHI

Streams: EC, EE, ME, CE, IN & PI

10th & 20th
May 2020

Course Duration: 60 to 70 Days

7838971777 (Call or Whatsapp)

delhi@aceenggacademy.com

Upcoming Batches @ HYDERABAD

GATE + PSUs - 2021	
Spark Batches	10th May, 8th & 23rd June 2020.
Regular Batches	26th April, 10th, 24th May, 8th, 23rd June, 7th, 22nd July, 5th & 20th August 2020.

ESE + GATE + PSUs - 2021	
Spark Batches	10th May, 8th & 23rd June 2020.
Regular Batches	29th March, 26th April, 10th, 24th May, 8th, 23rd June & 7th July 2020

Upcoming Batches @ DELHI

GATE + PSUs - 2021 & ESE + GATE + PSUs - 2021	
Regular Batches	21st March, 10th & 20th May 2020.

Upcoming Batches @ PUNE

GATE + PSUs - 2021 & ESE + GATE + PSUs - 2021	
Regular Batches	1st & 15th June, 6th July 2020.

www.aceenggacademy.com

follow us on:

48. A 100V/10V, 50VA transformer is converted to 100V/110V auto transformer, the rating of the auto transformer is
(a) 100 VA (b) 500 VA
(c) 110 VA (d) 550 VA

49. When a V-V three phase transformer system is converted into a Δ-Δ system, increase in capacity of the system is
(a) 86.6% (b) 50%
(c) 57.7% (d) 73.2%

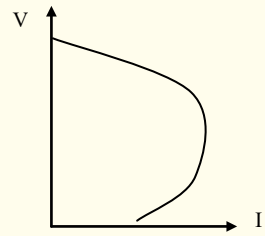
50. The all day efficiency of a distribution transformer will be low with high
(a) copper losses
(b) iron losses
(c) operating temperature
(d) copper as will as iron losses

51. Which of the following motor is suitable for high starting torque?
(a) Compound motor
(b) Cumulative compound motor
(c) Series motor
(d) Shunt motor

52. For a 6-pole dc machine with lap wound armature, the number of brushes required are
(a) 2 (b) 4 (c) 6 (d) 12

53. A dc shunt generator is supplying a load of 1.8 kW at 200 V. Its armature and field resistances are 0.2 Ω and 200 Ω respectively. What is the generated emf?
(a) 190 V (b) 195 V (c) 205 V (d) 210 V

54. The graph shown below represents which characteristic of a d.c shunt generator?



(a) Internal characteristic
(b) External characteristic
(c) Open-circuit characteristic
(d) Magnetic characteristic

55. The torque speed characteristic of a Repulsion motor resembles which of the following dc motor characteristic?
(a) Separately excited (b) Shunt
(c) Series (d) Compound

56. The slip of an induction motor is the ratio of
(a) rotor copper loss to rotor output
(b) stator copper loss to stator input
(c) rotor copper loss to rotor input
(d) rotor copper loss to stator input

57. To improve the power factor_____ slots are used
(a) Open (b) Semi-closed
(c) Closed (d) Either (b) or (c)

58. If the full-load speed of a 3-phase, 50 Hz, 6-pole, induction motor is 950 rpm. What is its half-load speed nearly equal to?
(a) 1000 rpm (b) 450 rpm
(c) 1900 rpm (d) 975 rpm

59. A single -phase motor is made self-starting by the addition of a/an
(a) running winding (b) starting winding
(c) electric starter (d) autotransformer

60. Which of the following is true about low frequency operation of ac series motor?
(a) It improves its commutation property but affects adversely the pf and efficiency.
(b) It improves its commutation property, pf and efficiency.
(c) It affects adversely commutation but improves pf and efficiency.
(d) It effects adversely efficiency but improves commutation and pf.

61. When 'V' is the supply voltage per phase and 'R' is the stator resistance per phase, the maximum mechanical power developed by the synchronous motor will be proportional to
(a) $\frac{V}{R}$ (b) $\frac{V^2}{R}$
(c) $\frac{R}{V^2}$ (d) $\frac{V}{R^2}$

62. The voltage across the open-circuited field terminals of a synchronous machine under slip test when the armature field rotation and rotor rotations are in opposite directions is
(a) ac of frequency nearly double the supply frequency.
(b) ac of slip frequency
(c) a modulated supply frequency ac voltage with slip frequency envelope
(d) ac of supply frequency

63. When compared with power transformer a distribution transformer has
(a) Low % Z and High copper loss to Iron loss ratio
(b) High % Z and High copper loss to Iron loss ratio
(c) High % Z and Low copper loss to Iron loss ratio
(d) Low % Z and Low copper loss to Iron loss ratio

64. In the measurement of X_d, X_q (in ohms), following data are obtained by the slip test on a salient pole machine:
$I_{d\,max} = 10$ A $I_{d\,min} = 6$ A
$V_{d\,max} = 30$ V $V_{d\,min} = 25$ V
Which one of the following is correct?
(a) $X_d = 3\ \Omega$, $X_q = 3.86\ \Omega$
(b) $X_d = 5\ \Omega$, $X_q = 2.5\ \Omega$
(c) $X_d = 3\ \Omega$, $X_q = 2.5\ \Omega$
(d) $X_d = 4.61\ \Omega$, $X_q = 3.86\ \Omega$

65. The leakage reactance of a three-phase alternator determined by performing
(a) Open circuit and zero power factor tests
(b) Zero power factor and slip tests
(c) Open-circuit and short-circuit tests
(d) Short-circuit and slip tests

66. In a single-phase induction motor
(a) both the main and auxiliary windings are placed on stator
(b) main winding is placed on stator and auxiliary winding on rotor
(c) both the main and auxiliary windings are placed on the rotor
(d) auxiliary winding is placed on stator and main winding on rotor

67. Control rods used in nuclear reactors are made of
(a) zirconium (b) boron
(c) beryllium (d) lead

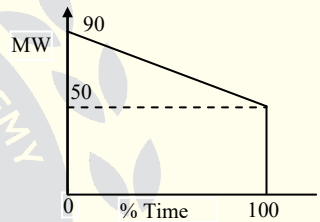
68. With reference to hydropower station, the graphical representation of the discharge as a function of time is known as:
(a) Monograph (b) Hectograph
(c) Load duration curve (d) Hydrograph

69. The charging reactance of 50 km length of the line is 1000 Ω. What is the charging reactance for 100 km length of the line?
(a) 1500 Ω (b) 3000 Ω
(c) 750 Ω (d) 500 Ω

70. The locus of constant received power is a circle of radius
(a) $\frac{|V_S||V_R|}{|B|}$ (b) $\frac{|V_S|^2}{|B|}$
(c) $\frac{|V_R|^2}{|B|}$ (d) $\frac{|V_S - V_R|^2}{|B|}$

71. The time interval needed for a surge to travel to the end of a 600 km long overhead transmission line is
(a) 6 s (b) 2 s
(c) 20 ms (d) 2 ms

72. The load duration curve for a power station is as shown in the below figure. The reserve capacity in the plant at 70% capacity factor is



(a) zero (b) 10 MW
(c) 30 MW (d) 50 MW

73. A power station has a maximum demand of 2500 kW and number of kWh generated per year is 45×10^5. The load factor is
(a) 10.25% (b) 20.5%
(c) 41% (d) 82%

74. Which of the following circuit breakers has the lowest voltage range?
(a) SF_6 circuit breaker
(b) Air-blast circuit breaker
(c) Tank type oil circuit breaker
(d) Air-break circuit breaker

75. Under voltage relays are mainly used for
(a) Motor protection
(b) Transformer protection
(c) Transmission line protection
(d) All the above

76. In case of frosted GLS lamps, frosting is done by
(a) acid etching (b) ammonia
(c) ozone (d) salt water

77. Pantograph is
(a) a device used to draw Speed-Time characteristics in traction.
(b) Used to supply a.c. to transformer in locomotive.
(c) a part of the control devices in locomotives.
(d) used in traction motors for better efficiency.

78. The frequencies and voltage used in Dielectric heating are
(a) 10 – 30 MHz, up to 25 kV
(b) 50 – 60 Hz, up to 25 kV
(c) 10 – 30 MHz, up to 100 V
(d) 50 – 60 Hz, 110 V – 230 V

79. In distribution system for power factor improvement, the power factor correction devices are installed at
(a) the sending end
(b) near the earthing point
(c) the load end
(d) anywhere in the circuit

80. Reflector mirrors employed for exploiting solar energy are called the
(a) Mantle (b) Heliostats
(c) Diffusers (d) Ponds

81. In lead acid battery, the density of acid indicates the
(a) charge of the battery
(b) level of acid
(c) e.m.f of the battery
(d) damage of the plates

82. A load has a per unit impedance of 0.6 to a base of 20 MVA and 33 kV. The p.u. impedance to a base of 10 MVA and 11 kV is:
(a) 0.121 (b) 2.7 (c) 0.133 (d) 0.9

83. Find the value of a^{729} where 'a' is an operator
(a) 1.0 (b) a (c) a^2 (d) 625

84. Which one of the following statement is normally correct for a Z bus matrix?
(a) Null matrix (b) Sparce matrix
(c) Full matrix (d) Unity matrix

85. Load flow study is carried out for
(a) Load Frequency control (b) Stability studies
(c) System planning (d) Fault calculations

86. For a given frequency, the deflecting torque of an induction ammeter is directly proportional to
(a) current (b) current^2
(c) current^3 (d) $\sqrt{\text{current}}$

87. A manganin swamp resistance is connected in series with a moving coil ammeter consisting of a milliammeter and a suitable shunt in order to
(a) minimize the effect of stray magnetic fields
(b) minimize the effect of temperature variation
(c) obtain large deflecting torque
(d) reduce the size of the meter

88. The bridge used to measure frequency is
(a) Schering bridge (b) Owen bridge
(c) Hay bridge (d) Wien bridge

89. Which bridge is best suited for use in Harmonic Distortion Analyzers?
(a) Heaviside
(b) Kelvin's double Bridge
(c) Wein
(d) Schering

90. Two equal voltages of same frequency applied to the X and Y plates of a CRO, produce a circle on the screen. The phase difference between the two voltages is
(a) 30° (b) 60° (c) 90° (d) 150°

91. Loading by the measuring instruments introduces an error in the measured parameter. Which of the following devices gives the most accurate result?
(a) PMMC (b) Hot-wire
(c) CRO (d) Electro dynamic

92. What is the number of turns of wire needed to provide a potentiometer with a resolution of 0.05 percent?
(a) 200 turns (b) 2000 turns
(c) 20 turns (d) 20000 turns

93. Consider the following transducers:
1. LVDT 2. Piezoelectric
3. Thermocouple 4. Photovoltaic cell
Which of the above are active transducers?
(a) 1, 2 and 3 (b) 1, 2 and 4
(c) 2 and 3 only (d) 2, 3 and 4

94. Which effect is the converse of Peltier effect?
(a) Seebeck effect (b) Thomson effect
(c) Hall effect (d) Joule effect

95. The errors introduced by an instrument fall in which category?
(a) Systematic error
(b) Random errors
(c) Gross errors
(d) Environmental errors

96. The reliability of an instrument refers to
(a) The measurement of changes due to temperature variation
(b) The degree to which repeatability continues to remain within specified limits
(c) The life of an instrument
(d) The extent to which the characteristics remain linear

97. A current transformer has a phase error of +3°. The phase angle between the primary and secondary currents is
(a) 3° (b) 177°
(c) 180° (d) 183°

98. An energy meter having a meter constant of 1200 rev per kWh is found to make 5 revolution in 75s. The load power is
(a) 500 W (b) 100 W
(c) 200 W (d) 1000 W

99. In the protection of transformers, harmonic restraint is used to guard against
(a) Magnetizing inrush current
(b) Unbalanced operation
(c) Lightning
(d) Switching over-voltages

100. A distance relay with inherent directional property is known as
(a) Buchholtz relay
(b) Admittance relay
(c) Directional over current relay
(d) Directional switched relay

ACE

New Batches @ Hyderabad

GATE + PSUs – 2021 (Short Term Batches)				
Batch Type	Timings	Batch Date	Duration	Venue & Streams
Short Term	Full Day Classes	28th April 2020	55 to 60 Days	**ABIDS** (CS&IT) **DILSUKHNAGAR** (EE, ME, PI) **KUKATPALLY** (EC, CE, INST)
		05th,10th,17th, 25th May 2020		
		01st & 08th June 2020		

GATE + PSUs – 2021 (Regular Batches)				
Batch Type	Timings	Batch Date	Duration	Venue & Streams
Regular	Daily 4 to 6 Hours	26th April 2020	5 to 6 Months	**ABIDS** (CS & IT)
		10th & 24th May 2020		
		08th & 23rd June 2020		
		07th & 22nd July 2020		
		26th April 2020	5 to 6 Months	**DILSUKHNAGAR** (EC, EE, INST, ME, PI) **KOTHAPET** (CE)
		10th & 24th May 2020		
		08th & 23rd June 2020		
		07th & 22nd July 2020		
		05th & 20th August 2020		
		17th May 2020	5 to 6 Months	**KUKATPALLY,** (EC, EE, ME, CE)
		01st & 15th June 2020		

GATE + PSUs – 2021 (Spark Batches)				
Batch Type	Timings	Batch Date	Duration	Venue & Streams
Spark	Daily 4 to 6 Hours	10th May 2020,	5 to 6 Months	**ABIDS** (EC, EE, ME, CE, CS & IT)
		08th & 23rd June 2020		

ESE + GATE + PSUs – 2021 Regular Batches				
Batch Type	Timings	Batch Date	Duration	Venue & Streams
Regular	Daily 6 to 8 Hours	29th March 2020	9 to 10 Months	**ABIDS** (EE, EC) **KOTHAPET** (CE, ME)
		26th April 2020		
		10th & 24th May 2020		
		08th & 23rd June 2020		
		07th July 2020		

ESE + GATE + PSUs – 2021 Spark Batches				
Batch Type	Timings	Batch Date	Duration	Venue & Streams
Spark	Daily 6 to 8 Hours	10th May 2020,	9 to 10 Months	**ABIDS** (EC, EE, ME, CE)
		08th & 23rd June 2020		

Early Bird Offer: Get Rs. 3,000/- Discount
(Register on or before 31st March 2020)

Detailed Solutions

01. Ans: (c)

Sol: In a PN Junction diode the dynamic conductance,

$$g_m = \frac{\Delta I}{\Delta V},\ g_m = \frac{I_C}{V_{BE}}$$

$$V_{BE} = I_E \times r_e$$

$$r_e = \frac{V_T}{I_E} \quad V_T = \frac{KT}{q}$$

i.e., $g_m \propto I_C$

$$g_m = \frac{I_C}{\frac{KT}{q}} = q\frac{I_C}{KT}$$

$g_m \propto \frac{1}{T}$ i.e., g_m is inversely proportional to the temperature

02. Ans: (a)

Sol: This configuration is also known as emitter follower. The properties are: high input impedance, very low output impedance, a unity (or less) voltage gain and a high current gain. This circuit is also used extensively as a "buffer".

03. Ans: (b)

Sol: Voltage gain of a common source JFET is

$$A_v = \frac{\mu R_d}{r_d + R_d}$$

μ = amplification factor

R_d = load resistance at drain

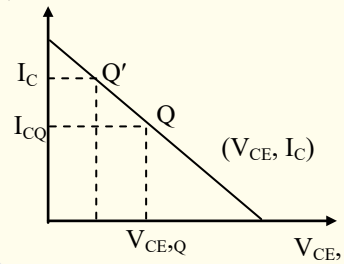
r_d = drain resistance

If $R_d >> r_d$, then $A_v \approx -\mu$

Thus voltage gain (A_v) depends on its amplification factor (μ).

04. Ans: (b)

Sol:



As $\beta\uparrow$, I_C will increase

Here V_{CE} is decreased

$(V_{CE} = V_{CC} = -I_C R_C)$

The operating point is shifted towards saturation region.

05. Ans: (a)

Sol: Voltage gain of an amplifier is proportional to the load resistance.

Transformer coupling provides high load resistance as the frequency of signal input increases [$X_L = 2\pi fL$].

Therefore transformer coupling provides high voltage gain.

06. Ans: (a)

Sol: Barkhausen criterion for sustained oscillation

$: A\beta = 1$

$: \angle A\beta = 360°$

07. Ans: (b)

Sol: ω_0 = higher cut-off frequency

With negative feedback higher cut-off frequency will increases.

08. Ans: (c)

Sol: Class B : max. efficiency = 78.5%

: Cross-over-distortion occurs

Class AB: Cross – over – distortion can be removed by using Class AB amplifier.

09. Ans: (b)

Sol:

$8 \mid 5621$

$8 \mid 702 - 5$

$8 \mid 87 - 6$

$8 \mid 10 - 7$

$1 - 2$

$0.125 \times 8 = 1.0 = 1$

$(12765.100)_8$

10. Ans: (d)

Sol: In k-map, only one bit difference is permitted between grouping cells. Hence Gray code is used for cell identification.

11. Ans: (b)

Sol: For n-bit flash type A/D converter we required $2^n - 1$ comparators, 2^n Resistors and a priority encoder.

$\therefore$ For 4 - bit flash type A/D converter we required $(2^4 - 1) = 15$ comparators.

12. Ans: (d)

Sol: R-H table

s^3	a_1	a_3
s^2	a_2	a_0
s^1	$\frac{a_2 a_3 - a_0 a_1}{a_2}$	0
s^0	a_0	

For stability, all the elements in the first column of Routh table should not have sign changes.

$a_1 > 0, \quad a_2 > 0, \ a_0 > 0$

$\frac{a_2 a_3 - a_0 a_1}{a_2} > 0$

$a_2 a_3 > a_0 a_1$

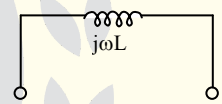
So option (d) is the correct choice.

13. Ans: (c)

Sol: In Nyquist plot, we are using principle of argument.

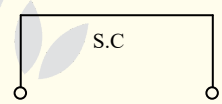
14. Ans: (b)

Sol: For DC voltage, f = 0



$X_L = j\,2\pi(0)\,L$

$= 0$



Inductor behaves as short circuit

15. Ans: (b)

Sol: $C_{eq} = C_1 + C_2 + C_3 + C_4$

$= 40\ \mu F$

16. Ans: (b)

Sol: Specific resistance is depends on type of material and does not depend on physical dimensions

17. Ans: (d)

Sol: Because at starting capacitor acts as short circuit.

ACE®
Engineering Academy
Leading Institute for ESE/GATE/PSUs
Since 1995

24 Years of Excellence
Since 1995

DEEP LEARN

ONLINE CLASSES

for

ESE
GS & Engg. Aptitude

250+
Hours of Classes
with Quizzes

GATE
CS & IT

450+
Hours of Classes
with Quizzes

SALIENT FEATURES

- Erudite & Experienced Faculty
- Free ONLINE Test Series
- Live Doubt Clearing Sessions
- Write & Store Your Notes ONLINE
- Relevant Study Material
- EMI Option Available

LAUNCHING SOON
for
SSC-JE , RRB-JE
& Other State Engineering Service Exams.

Scan QR Code
to Download
Deep-Learn
Mobile App

GET IT ON Google Play

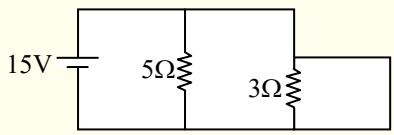
Access The Course at
www.deep-learn.in

H.O. #4-1-1236/1/A, Sindhu Sadan, King Koti, Abids, Hyderabad – 500001, Telangana, India.

Call: 040-23234418/19/20 | www.aceenggacademy.com

18. Ans: (C)

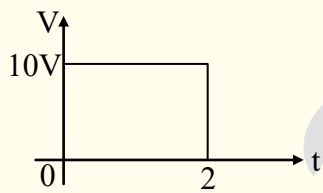
Sol:



$$I_{SC} = \frac{15}{0} = \infty$$

19. Ans: (c)

Sol:



$$i = \frac{1}{L}\int V dt = \frac{1}{1}\int_0^2 10 dt$$

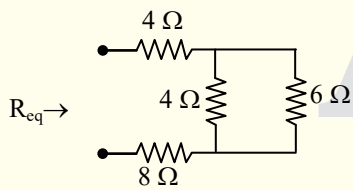
$i = 10t\,|_0^2$

At $t = 0 \Rightarrow i = 0$

At $t = 2 \Rightarrow i = 20$ A

20. Ans: (a)

Sol:



$R_{eq} = 4 + 8 + (6 \parallel 4)$

$= 14.4\ \Omega$

21. Ans: (b)

22. Ans: (a)

Sol: Given data, $\frac{dv}{dt} = 2$V/sec

$C = 1\ \mu$F

Current flowing through a capacitor $= I_C = C\frac{dv}{dt}$

$I_C = 1 \times 10^{-6} \times 2$

$= 2 \times 10^{-6}$ A

23. Ans: (c)

Sol: The energy stored in the battery is in the form of charge, Q

$Q = i \times t$ = Ampere hours

24. Ans: (c)

Sol: Let $v(t) = \sin\omega t$

$$\therefore i(t) = C\frac{dv(t)}{dt} = C\omega \cos \omega t$$

$$\text{Instantaneous power } p(t) = v(t)\, i(t) = \frac{C\omega}{2}\sin(2\omega t)$$

$\therefore$ Energy in the capacitor over one cycle,

$$\int_0^{2\pi/\omega} p(t)\,dt = \frac{C\omega}{2}\int_0^{2\pi/\omega} \sin(2\omega t)\,dt = 0$$

25. Ans: (b)

Sol: $L \propto N_2$, $R \propto N$

If N is doubled,

$$\frac{L_1}{L_2} = \frac{1}{4},\ \frac{R_1}{R_2} = \frac{1}{2}$$

$$\frac{T_1}{T_2} = \frac{\frac{L_1}{R_1}}{\frac{L_2}{R_2}} = \frac{\frac{L_1}{L_2}}{\frac{R_1}{R_2}}$$

New Time constant, $T_2 = 2\,T_1 = 2\,T$

26. Ans: (d)

Sol: Apply KCL at first node A,

$2 + 7 + I_1 = 3 \Rightarrow I_1 = -6A$

Apply KCL at second node B,

$4 + 6 = I_2 + 1 \Rightarrow I_2 = 9A$

27. Ans: (c)

Sol: $V = V_m \sin\omega t$

$= V_{RMS} \sin(2\pi ft)$

$= 30 \sin(2\pi(50)t) = 42.42 \sin 314\, t$

28. Ans: (b)

Sol: For RLC series circuit, at half power points

$$I = \frac{I_0}{\sqrt{2}} \qquad \frac{V}{Z} = \frac{V}{\sqrt{2}R}$$

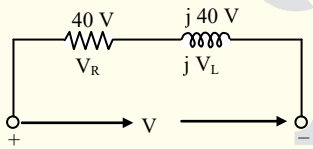
$Z^2 = 2R^2 \Rightarrow R^2 + (X_L - X_C)^2 = 2R^2$

$(X_L - X_C)^2 = R^2$

$(X_L - X_C) = +R$ and $(X_L - X_C) = -R$

29. Ans: (b)

Sol:



$V = \sqrt{V_R^2 + V_L^2} = 40$

$= \sqrt{(40)^2 + (40)^2} = 40\sqrt{2} = 56.56$ V

30. Ans: (d)

Sol: Writing KCL equation at middle node,

$$10 = 2 + \frac{2R - 40}{10} \Rightarrow 2R = 120,\ R = 60\ \Omega$$

31. Ans: (c)

Sol: $Z = 3 - j2$

$$Y = \frac{1}{Z}$$

$$Y = \frac{1}{3 - j2} \times \frac{3 + j2}{3 + j2}$$

$$Y = \frac{3 + j2}{13}$$

$$Y = \frac{3}{13} + \frac{j2}{13}$$

32. Ans: (c)

Sol: $V_L = 2V_C$ or $\omega LI = \frac{2}{\omega C} I$

or $\omega L = \frac{2}{\omega C}$

$R = 20\ \Omega$

$$Z = R + j\left(\omega L - \frac{1}{\omega C}\right) = 20 + j\frac{\omega L}{2}$$

$$\bar{I} = \frac{\bar{V}}{Z},\ \text{I lags V by } 45°$$

$$\angle Z = \tan^{-1}\left(\frac{\omega L}{40}\right) = 45°$$

$\therefore$ Inductive reactance $= \omega L = 40\ \Omega$

33. Ans: (b)

Sol: Given, total flux $\phi = 80\ \mu$Wb

mmf = 160 AT

Reluctance = ?

$$R = \frac{\text{mmf}}{\text{flux}} = \frac{160}{80 \times 10^{-6}}$$

$= 2 \times 10^6$ AT/Wb

34. Ans: (c)

Sol: The lag or delay of a magnetic flux density is commonly known as hysteresis. This relates to the magnetization properties of a material by which it firstly becomes magnetized and then de-magnetized.

35. Ans: (c)

Sol: The amount of flux production is the only property to decide the attraction capacity of an electromagnet. So, if the flux density increases then the attraction capacity of an electromagnet will also increase.

36. Ans: (b)

Sol: ρ_1=1 C/m, ρ = 1 m

$$\bar{E} = \frac{\rho_1}{2\pi\rho\varepsilon_0} = \frac{1}{2\pi\varepsilon_0}$$

37. Ans: (d)

Sol: Generalized Maxwell's equations are

1. $\nabla\times\vec{E} = -\frac{\partial\vec{B}}{\partial t}$
2. $\nabla.\vec{D} = \rho_v$
3. $\nabla\times\vec{H} = J_C + \frac{\partial\vec{D}}{\partial t}$
4. $\nabla.\vec{B} = 0$

For static fields $\frac{\partial}{\partial t}(*) = 0$

1. $\nabla\times\vec{E} = 0$
2. $\nabla.\vec{D} = \rho_v$
3. $\nabla\times\vec{H} = J_C$
4. $\nabla.\vec{B} = 0$

38. Ans: (a)

Sol: $\omega_0 = \frac{1}{\sqrt{L_{eq}C}}$

$L_{eq} = L_1 + L_2 + 2M$

$= 4 + 4 + 2\times 4$

$= 8 + 8$

$= 16$ mH

$$\omega_0 = \frac{1}{\sqrt{16\times10^{-3}\times40\times10^{-6}}}$$

$= 1250$ rad/sec

39. Ans: (d)

Sol: Rate of change of current, $\frac{dI}{dt} = \frac{\text{Induced emf}}{\text{inductance}}$

$= \frac{16}{4}$

$= 4$ A/s

40. Ans: (c)

Sol: DC current cannot induce any voltage and induced emf is directly proportional to the frequency of current.

Therefore, 1 amp 100 Hz is the right answer.

41. Ans: (d)

Sol: Order of resistivity

Cu < A*l* < iron < manganin

Hence, Cu is having least resistivity

42. Ans: (b)

Sol: Mutual inductance M is given as $M = K\sqrt{L_1L_2}$

Where K = coefficient of coupling

Value of K : $0 < K < 1$

Hence $M < \sqrt{L_1L_2}$ is correct option

43. Ans: (a)

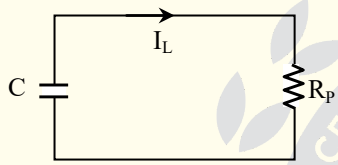
Sol: $H = \frac{E}{\eta} = \frac{5}{120\pi}$

44. Ans: (c)

Sol: The amount of electrostatic field is directly proportional to μ_r (i.e., relative permitting of the medium)

45. Ans: (d)

Sol:



As dielectric of a capacitor is not ideal and a small leakage current (I_L) flows through R_p and this led to internal heating of capacitor (non ideal)

46. Ans: (d)

Sol: Due to non-linearity in the core, harmonics will develop.

47. Ans: (c)

Sol: Open circuit test is actually conducted to find shunt branch parameters R_{0i} & X_{0i} of transformer equivalent circuit.

Where $R_{0i} = \frac{V_1}{I_w}$ and $X_{0i} = \frac{V_1}{I_\mu}$

48. Ans: (d)

Sol: $k = \frac{LV}{HV} = \frac{100}{110}$

Auto transformer rating $= \frac{1}{(1-k)} \times$ two winding transformer

$$= \frac{1}{1-\frac{10}{11}} \times 50 = 550 \text{ VA}$$

49. Ans: (d)

Sol: In V–V connection, VA rating is $VA_{v-v} = \sqrt{3}\, V_{ph} I_{ph}$

In Δ-Δ connection, VA rating is $\frac{VA_{\Delta-\Delta}}{VA_{V-V}} = \frac{3V_{ph} I_{ph}}{\sqrt{3}\, V_{ph} I_{ph}}$

$VA_{\Delta-\Delta} = 1.732\, VA_{V-V}$

$\therefore$ 73.2% will be increased

50. Ans: (d)

Sol: All day efficiency of a distribution transformer

$$= \frac{\text{Energy output in 24 hours}}{\text{Energy output in 24 hours loss due to iron loss in 24 hours} + \text{Energy loss due to copper loss in 24 hours}}$$

If the iron losses and copper losses of the transformer are high, all day efficiency will be low Option (d) is correct.

51. Ans: (c)

Sol: DC series motor has high starting torque.

52. Ans: (c)

Sol: No. of brushes

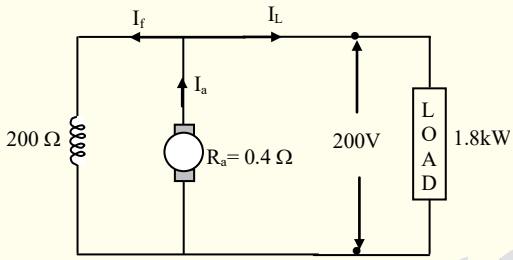
= No. of poles in lap winding

= 2 in wave winding

= No. of poles for large current wave wound machine.

53. Ans: (c)

Sol:



Generated EMF

$\Rightarrow E_g = V + I_a . R_a$ ..... (1)

Electrical load, $P_L = V.I_L = 1.8$ kW

$\Rightarrow I_L = \frac{1800}{200} = 9$ A,

$I_f = \frac{V}{R_f} = \frac{200}{200} = 1$ A

For generator $\Rightarrow I_a = I_L + I_f$

$= 9A + 1A = 10A$

From eq (1),

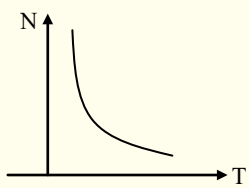
$E_g = 200 + (10)(0.2) = 205$ V

54. Ans: (b)

Sol: Graph represents External characteristics of DC shunt generator drawn for $V \sim I_a$.

55. Ans: (c)

Sol: For repulsion motor the speed Torque Characteristics resembles that of a series motor.



56. Ans: (c)

Sol: Rotor input: rotor copper loss: rotor output= 1: s : 1– s, $s = \frac{\text{rotor copper loss}}{\text{rotor input}}$

57. Ans: (d)

Sol: Power factor in open slots < power factor in semi-closed slots < power factor in closed slots.

58. Ans: (d)

Sol: $S = \frac{N_s - N_r}{N_s}$

$N_s = \frac{120 \times f}{P} = \frac{120 \times 50}{6} = 1000$

$S_1 = \frac{1000 - 950}{950} = 0.05$

For half load $S_2 = \frac{S_1}{2} = \frac{0.05}{2} = 0.025$

$N_r = N_s (1 - S)$

$N_r = 1000(1 - 0.025) = 975$ rpm

59. Ans: (b)

Sol: It is assumed that the question refers to a single-phase induction motor. An auxiliary winding (or starting winding), with its axis 90° away from the axis of the main winding (or running winding) is provided in the stator of the motor. The auxiliary winding is designed such that when it receives the same ac voltage supply as the main winding, it draws a current nearly in phase with the supply voltage while the main winding draws a current lagging the supply by a much larger angle.

This phase shift between the main and auxiliary winding current causes a non -zero starting torque and the motor becomes self-starting.

ACE Engineering Academy
Leading Institute for ESE/GATE/PSUs
24 Years of Excellence
040 - 48539866 / 040 - 40136222
testseries@aceenggacademy.com

ESE-2020 (MAINS)

OFFLINE TEST SERIES

NO. OF TESTS : 14 (GRAND TESTS : 10 & MOCK TESTS : 4)

- Starts from **28th March 2020**
- **Test Series will be conducted at all ACE centres.**

Hyderabad | Delhi | Pune | Bhubaneswar | Bengaluru | Lucknow | Chennai
Vijayawada | Vizag | Tirupathi | Kukatpally | Kolkata | Ahmedabad | Kothapet

HIGHLIGHTS :

- All tests will be conducted in QCAB format.
- All tests will be conducted in same format followed by UPSC.
- Meticulously designed test series, which maximizes your potential.
- All India rank will be given for each test among the ACE students.
- Detailed solutions will be given for each test.

Free
Classroom Coaching,
Postal Coaching and Test Series for
All ESE-2020 Prelims Qualified Students

UPPSC

UPPSC

UTTAR PRADESH PUBLIC SERVICE COMMISSION

Assistant Engineer Examination 2019

Online Test Series (Civil Engineering)

No. of Tests : 18
Subject Wise Tests : 12
Mock Tests : 6

Starts From **2nd March 2020**
All tests will be available till
UPPSC Assistant Engineer Examination

For Registration Please Visit Our Website : www.aceenggacademy.com

60. Ans: (b)

Sol: Let ac series motor be operated at a lower frequency than it is rated. Then

1. Reactances of windings will be smaller. This improves the power factor.
2. With lesser frequency, increase in winding resistance due to skin effect is smaller and hence copper losses are smaller. Also, eddy current and hysteresis losses in the cores become smaller. These cause the efficiency to improve.
3. With currents in the armature coils varying with lesser frequency, induced emfs in the coils undergoing commutation reduce, and commutation is improved.

A detailed analysis is needed to give an quantitative justification for the conclusions.

61. Ans: (b)

Sol: Maximum mechanical power developed by varying both excitation and load is, $P = \frac{V^2}{4R}$

Therefore, $P \propto \frac{V^2}{R}$

62. Ans: (a)

Sol:
- During slip test an emf is induced in open field winding which is A.C sinusoidal at slip frequency.
- As the air gap is non uniform, the reactance offered varies cyclically and hence armature current drawn also varies cyclically at twice the slip frequency.
- During the slip test the rotor is driven at less than synchronous speed. If it is driven at synchronous speed, then no variations in ammeter and voltmeter readings.
- During slip test sometimes the induced emf in the open field winding will be much more. The reason is the armature field rotation & rotor rotations are in opposite directions. Induced emf is much more and it's frequency nearly double the supply frequency.

63. Ans: (a)

Sol: i) For power transformer full load copper loss $\simeq$ iron loss but for distribution transformer full load copper loss = 2 iron loss.

ii) Distribution transformer has low % impedance.

64. Ans: (b)

Sol: $X_d = \frac{V_{d\,max}}{I_{d\,min}} = \frac{30}{6} = 5\ \Omega$

$X_q = \frac{V_{d\,min}}{I_{d\,max}} = \frac{25}{10} = 2.5\ \Omega$

65. Ans: (a)

Sol: Leakage reactance of the alternator found from "potier triangle method". i.e., "zero power factor method". For this method, we should conduct both open circuit and ZPF tests.

66. Ans: (a)

67. Ans: (b)

Sol: Control rods are used to absorb the neutrons. Cadmium and Boron are the two most commonly used materials.

68. Ans: (d)

Sol: The graphical representation of the discharge as a function of time is known as Hydrograph.

69. Ans: (d)

Sol: $Xc = \frac{1}{\omega C \ell} \Rightarrow Xc = \frac{1}{\ell}$

$$\frac{X_{C1}}{X_{C2}} = \frac{\ell_2}{\ell_1} \Rightarrow X_{C2} = 1000 \times \frac{50}{100} = 500$$

70. Ans: (a)

71. Ans: (d)

Sol: Given data: Length of line, $l = 600$ km

Time taken by surge to reach end of the line,

$$T = \frac{\text{length of line}}{\text{velocity of wave}}$$

$$= \frac{600}{3 \times 10^5} s = \frac{600}{300 \times 10^3} s = 2 \text{ ms}$$

72. Ans: (b)

Sol: Plant capacity factor $= \frac{\text{Average load}}{\text{installed capacity}}$

Average load = Area covered under the curve

$$= 90 \times 100\% - \frac{1}{2}(40 \times 100\%)$$

$$= 100\%\left(90 - \frac{1}{2} \times 40\right) = 70 \text{ MW}$$

Installed capacity $= \frac{70}{0.7} = 100\text{MW}$

Reserve capacity = Installed capacity – Max. load

$$= 100 - 90 = 10 \text{ MW}.$$

73. Ans: (b)

Sol: $\frac{\text{energy generated during 24 hrs}}{\text{maximum demand} \times 24 \text{ hrs}} = \frac{(45 \times 10^5)}{2500 \times 365 \times 24}$

$= 20.5\%$

74. Ans: (d)

Sol: Air-break circuit breakers are used for voltages, below 1kV.

75. Ans: (a)

Sol: Under voltage relays are mainly used for protection of motors because for a given load torque if under voltage occurs the motor draws more current to meet the load. If the current is beyond rated current, windings may burn out due to insulation failure.

76. Ans: (a)

Sol: GLS (general lighting service) lamps are the source of incandescent light.

Acid etching creates a very smooth, glossy and satin finish; the acid-etched lamp is maintenance free as it does not show dirt marks or fingerprints

77. Ans: (b)

Sol: A pantograph is a device for collecting an electrical current to power an electric locomotive, or EMU. The system is employed to make contact with an electrified overhead wire (cable).

Pantographs come in all shapes and sizes depending on the speed of the loco/train set, power requirements, power supply systems etc. The basic parts of a pantograph is a lower arm(s) that pivot against the roof, of a carriage/loco, and

is attached to upper arm(s) that is in-turn attached to a collector 'head' or 'pan'. The head is the only part of the pantograph to touch the wire pick-up. The current is collected via metalized carbon strips on the head.

78. Ans: (a)

Sol: In dielectric heating, for producing sufficient heat frequency is used between 10 MHz and 30 MHz. Dielectric heating depend upon the value of frequency. Hence to achieve more heat, high frequency is used.

79. Ans: (c)

Sol: Power factor is the cosine of angle between voltage and current.

Inductive loads generate lagging current and power factor will be lagging. Capacitive loads generate leading current and leading power factor. Most of the loads are combination of resistive and inductive loads. So resultant power factor will be less than one and lagging which is not good for electrical system. Transformer output reduced with reduced power factor. System load carrying capacity will affect because same capacity load with less power factor required more current to flow. Now if additional capacitor used at load point, then total power factor will improve and system delivered best output with less current to same load.

80. Ans: (b)

Sol: Reflector mirrors employed for exploiting solar energy are called the Heliostats.

81. Ans: (a)

Sol: In lead acid battery, the density of acid indicates the charge of the battery.

82. Ans: (b)

Sol: $$Z_{pu\ new} = Z_{pu\ old} \times \frac{MVA_{new}}{MVA_{old}} \times \left(\frac{kV_{old}}{kV_{new}}\right)^2$$

$$= 0.6 \times \frac{10}{20} \times \left(\frac{33}{11}\right)^2 = 2.7\ p.u$$

83. Ans: (a)

Sol: $a^{729} = a^{243\times3} = a^3 = 1$

84. Ans: (c)

Sol: Normally, Z-bus matrix is a full matrix

Y-bus matrix is a sparse matrix

85. Ans: (c)

Sol: A load flow study should be performed during the planning design stages of a power system and evaluating changes to an existing system.

86. Ans: (b)

Sol: Deflecting Torque $T_d \propto \phi_{1m}\ \phi_{2m} \sin\alpha$

Both fluxes are produced by same alternating current I

$$\therefore T_d \propto I^2$$

87. Ans: (b)

Sol: This swamping resistance is made up of constant temperature coefficient materials like manganin and constantan for reducing the temperature errors.

Hearty Congratulations to our **GATE-2019 Top Rankers**

AIR 1 — PRAKHAR SINGH — CE

AIR 1 — SURYANARYANA — PI

AIR 1 — RAJAT SONI — EC

AIR 1 — PRANAV SHARMA — CSIT

AIR 1 — SHASHANK MANGAL — IN

AIR 2 — KUNAL G — EE

AIR 2 — MUKESH POONIA — EE

AIR 2 — ANAND JERRY GEORGE — EC

AIR 2 — PRIYANKA GUPTA — IN

AIR 2 — VINAY SEELAM — PI

AIR 3 — ANKIT KULHARI — ME

AIR 3 — IDRIS MANAQIBWALA — CE

AIR 3 — SHUBHAM MAURYA — EC

AIR 3 — PRATEEK AGARWAL — CSIT

AIR 3 — VINEET GOSWAMI — IN

AIR 3 — ROHIT KHANNA — PI

AIR 4 — CHETAN HANAKANAHALLI — EC

AIR 4 — CHAITANYA KUMAR — EC

AIR 4 — ARJUNDAS K — IN

AIR 4 — RAJ BHAWANI SINGH — IN

AIR 4 — SIDDARTH WADHWA — ME

AIR 5 — SAYANTAN BHATTACHARYA — EE

AIR 5 — PRADEEP KUMAR VERMA — EE

AIR 5 — CHARMIN PATEL — ME

AIR 5 — AYUSH JHAM — PI

AIR 5 — RUTVIK LATHIA — XE

AIR 6 — PRIYANSHU SHARMA — EC

AIR 6 — HARI SHRAWGI — CSIT

AIR 6 — RAMESH KAMULLA — IN

AIR 6 — RAJ ZUNKE — PI

AIR 7 — CHIRAG RATHI — CE

AIR 7 — SHREYANS MEHTA — CE

AIR 7 — ANKIT KUMAR — EC

AIR 7 — SAIKIRAN CHOLLETI — EC

AIR 7 — DEEPITA ROY — EE

AIR 7 — SHUBHAM MITTAL — EE

AIR 7 — SAISH KALASKAR — IN

AIR 7 — SHWETA YADAV — IN

AIR 7 — AMIT LAL SHAH — PI

AIR 7 — ANUJ MEENA — PI

AIR 9 — RAVI SHANKAR MISHRA — CSIT

AIR 9 — ARKA RAY — CSIT

AIR 9 — RANJIT KUMAR SINGH — EC

AIR 9 — DEEP ADHVARYU — IN

AIR 9 — B. SREEKAR — IN

AIR 9 — ATULYA JYOTI — PI

AIR 10 — GEETH GEORGE — EE

AIR 10 — ASIF KHAN — CE

AIR 10 — MAHESH SINGH YADAV — ME

AIR 10 — GARVIT GUPTA — XE

AIR 10 — MANMOHAN ARORA — PI

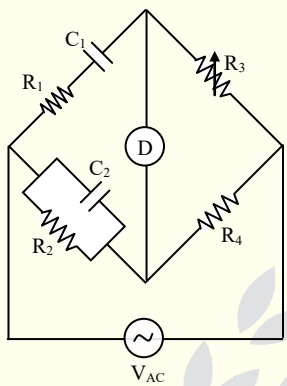
AIR 10 — SHUBHAM PANDE — PI

and many more...

	TOP 10	TOP 100
CE	5	44
ME	6	60
EE	7	71
EC	9	74
CS	5	28
IN	10	74
PI	10	49

88. Ans: (d)

Sol: Wien bridge is used frequency measurement



$$f = \frac{1}{2\pi\sqrt{R_1 R_2 C_1 C_2}}, \quad \frac{R_1}{R_2} + \frac{C_2}{C_1} = \frac{R_3}{R_4}$$

89. Ans: (c)

Sol: Harmonic distortion analyzer requires tuning to specific frequencies.
Hence Wein bridge is suitable

90. Ans: (c)

Sol: A circle is produced on the screen when the phase difference is either 90° or 270°.

91. Ans: (c)

Sol: CRO has high input impedance and high sensitivity
$\therefore$ CRO gives the most accurate results.

92. Ans: (b)

Sol: $\frac{100}{0.05} = 2000$ turns

93. Ans: (d)

Sol: Piezoelectric, thermocouple, photovoltaic cell are active transducers, while LVDT is passive transducer. Active transducers do not require an auxiliary power source to produce their output.

94. Ans: (a)

Sol: Converse of Peltier effect is seebeck effect:
Peltier effect: If a current flows through a thermocouple heat is absorbed at one junction and liberated at other.
Seebeck effect: If two wires of strips dissimilar metals are welded together at both ends to form a thermocouple circuit, and if the two junctions are maintained at different temperatures an electric current flows through the circuit.

95. Ans: (a)

Sol: All Instrumental errors are comes under the category of systematic error.
The error introduced by an instrument is due to ageing effect and manufacturing defect.

96. Ans: (b)

Sol: Instrument reliability is a way of ensuring that any instrument used for measuring experimental variables gives the same results every time. It is extent to which the instrument yields the same results on repeated trials.

97. Ans: (b)

Sol: Phase error is the angle between primary current (I_p) and reversed secondary current.
Angle between I_s and I_p = 180°– 3° = 177°

98. Ans: (c)

Sol: k = 1200 rev/kWh

Revolutions/hour = k × power

$$= \frac{5}{\frac{75}{3600}}$$

= 1200 × power in kW

Power = 0.2 kW = 200 W

99. Ans: (a)

Sol: When the supply switch of transformer is closed then the magnetic inrush current having harmonics predominantly 2nd harmonic will flow. Due to this the relay will operate, through it is not a fault. So as to prevent this harmonic restraint coil is used in the relay.

100. Ans: (b)

Sol: MHO relay measures a component of admittance $|Y|\angle\theta$. It is inherently a directional relay as it detects the fault only in the forward direction.

Hearty Congratulations to our **ESE-2019 Top Rankers**

and
many more...

Total Selections in **Top 10: 33 | EE : 9 | E&T : 8 | ME : 9 | CE : 7**