AE (Electrical) Master Question Set with Answer Keys

1)	Consider a situation where a particular laboratory has several resisters of 100 Ω only. Which of the following combinations is the best for replacing a 150 Ω resistor in a circuit using the resistors available in the laboratory?		
A)	Three in series	B)	Two in parallel and one in series
C)	Two in parallel and two in series	D)	Three in parallel
Correct Answer:	B		
2)	Which of the following is opposite of conductance?		
A)	Capacitance	B)	Inductance
C)	Resistance	D)	Imaginance
Correct Answer:	C		
3)	Which of the following is true with a regenerative braking?		
A)	It uses an energy recovery mechanism which slows down a vehicle by converting its kinetic energy into another form	B)	It uses an energy recovery mechanism which transforms the braking energy into kinetic energy of the vehicle
C)	It uses an energy recovery mechanism which reduces the speed of a vehicle by converting the electrical energy into kinetic energy.	D)	It regenerates the brake fluids for use at a future period
Correct Answer:	A		
4)	Which of the following functions is carried out by a commutator?		
A)	It provides the electrical connections via brushes to the armature winding	B)	It reverses the current direction between the rotor and the external circuit
C)	Both A and B	D)	None of these
Correct Answer:	C		
5)	What is the SI unit for permittivity?		
A)	F/M	B)	Ω/M
C)	V/M	D)	A/M
Correct Answer:	A		
6)	What is the permittivity of free space (vacuum permittivity)?		
A)	8.854×10^9	B)	8.854×10^{12}
C)	8.854×10^6	D)	8.854×10^{15}
Correct Answer:	B		
7)	Unimpregnated paper, silk, cotton, vulcanized natural rubber, thermoplastics that soften above 90 C are categorized as which of the following insulation/thermal class?		
A)	A	B)	B
C)	E	D)	Y
Correct Answer:	D		
8)	Which of the following theorems states that common voltage across parallel branches with different voltage sources can be determined by the relation $V = (V_1 / R_1 + V_2 / R_2 + V_3 / R_3) / (1 / R_1 + 1 / R_2 + 1 / R_3)$?		
A)	Millman's theorem	B)	Rodin's theorem
C)	Voltage temperance theorem	D)	Voltage aggregation theorem
Correct Answer:	A		

9)	Which of the following has the highest dielectric constant?		
A)	Germanium	B)	Vacuum
C)	Glass	D)	Mica
Correct Answer:	A		
10)	Which of the following is true with auto transformer?		
A)	It has only one winding	B)	It adjusts automatically as a "step-down" or "step-up" transformer depending on the use
C)	Both A and B	D)	None of these
Correct Answer:	A		
11)	The electric field inside a conducting sphere is always _____		
A)	Greater than zero	B)	Equal to zero
C)	Less than zero	D)	Equal to 2п/V
Correct Answer:	B		
12)	What is the electrical charge of one electron?		
A)	1.6×10^{-19} Coulomb	B)	0.625×10^{-19} Coulomb
C)	1.6×10^{-9} Coulomb	D)	0.625×10^{-9} Coulomb
Correct Answer:	A		
13)	Which of the following is measured by Ampere-second?		
A)	Conductance	B)	Energy
C)	Current	D)	Charge
Correct Answer:	D		
14)	A series circuit has 100 resistors, each having resistance of 1 Ω and 1 A current is flowing through this circuit. What will be the current in the circuit when these 100 resistors are connected in parallel?		
A)	100 A	B)	1000 A
C)	10000 A	D)	None of these
Correct Answer:	C		
15)	Given that the current carrying capacity of aluminum conductor is 3 A/ mm^2, what is the minimum cross section of a aluminum wire to carry a current of 27 A?		
A)	$9\ mm^2$	B)	$3\ mm^2$
C)	$27\ mm^2$	D)	$81\ mm^2$
Correct Answer:	A		
16)	The drift velocity is D when a potential difference of P applied across the ends an aluminum wire of length 2 meters and diameter of M. What is the drift velocity if the diameter of the wire is made 2M?		
A)	2D	B)	2x2 D
C)	D/2	D)	D
Correct Answer:	D		
17)	If the mass of an electron is m, what is the mass of a proton?		
A)	18.4 m	B)	184 m
C)	1.84 m	D)	None of these
Correct Answer:	D		

18)	What is the amount of charge that flows through a circuit which carries a current of 4 A for 3 minutes?		
A)	12 Coulomb	B)	120 Coulomb
C)	720 Coulomb	D)	None of these
Correct Answer:	C		
19)	Which of the following is the cause for flow of current in a solid conductor?		
A)	Protons	B)	Electrons
C)	Atoms	D)	Molecules
Correct Answer:	B		
20)	A current of 10 A is flowing through a circuit. This is same as _____		
A)	10 Watts	B)	10 Coulombs/second
C)	10 Volts	D)	10 Ohms
Correct Answer:	B		
21)	What is the current when 4 Coulombs pass through a point for 5 seconds?		
A)	0.8 A	B)	20 A
C)	1.2 A	D)	None of these
Correct Answer:	A		
22)	Which of the following is true with respect to Coulomb's law?		
A)	The magnitude of the electrostatic force of interaction between two point charges is directly proportional to the scalar multiplication of the magnitudes of charges	B)	The magnitude of the electrostatic force of interaction between two point charges is inversely proportional to the square of the distance between them
C)	Both A and B	D)	None of these
Correct Answer:	C		
23)	What is the absolute permittivity of a dielectric medium where E_0 is the permittivity of free space and E_1 is the relative permittivity of the medium?		
A)	E_0 / E_1	B)	$E_0 \ E_1$
C)	E_1 / E_0	D)	None of these
Correct Answer:	B		
24)	Given J is the current density at a given location in a resistive material, E is the electric field at that location, and σ is a material-dependent parameter called the conductivity, Ohm's law can be expressed as _____		
A)	$J = \sigma/E$	B)	$J = E/\sigma$
C)	$J = \sigma E$	D)	$J = \sigma E^2$
Correct Answer:	C		
25)	What is the power factor of the circuit when a current of 8 A flows in the ac circuit when 100 V dc is applied to it whereas it takes 125 V ac to produce the same current?		
A)	0.8	B)	1.6
C)	1.25	D)	None of these
Correct Answer:	A		
26)	When the strength of current in 2 H inductor changes at a rate of 4 A / sec, what is the voltage across it?		
A)	8 V	B)	2 V
C)	0.5 V	D)	None of these
Correct Answer:	A		

27)	What is immittance?		
A)	It is concept combining the Current and voltage	B)	It is concept combining the Current (I) and admittance
C)	It is concept combining the Voltage and Permittivity	D)	It is concept combining the impedance and admittance
Correct Answer:	D		
28)	What is the SI unit for electrical flux?		
A)	V m	B)	N m^2 C^{-1}
C)	Both A and B	D)	None of these
Correct Answer:	C		
29)	What happens to the field strength when a dielectric is placed in an electric field?		
A)	It doubles	B)	It increases
C)	It remains the same	D)	It decreases
Correct Answer:	D		
30)	Which of the following is true with respect to a Faraday cage?		
A)	It provides constant voltage on all sides of the enclosure	B)	It blocks external static and non-static electric fields by channeling electricity through the mesh
C)	Both A and B	D)	None of these
Correct Answer:	A		
31)	Which of the following is an example of electromechanical solenoid?		
A)	Sparkplug	B)	Automobile starter
C)	Both A and B	D)	None of these
Correct Answer:	B		
32)	What is the SI unit of electrical conductance?		
A)	Mho	B)	Siemens
C)	Ω^{-1}	D)	All the above
Correct Answer:	D		
33)	If four elements, each having equal conductance of G are connected in parallel, what is their combined conductance?		
A)	1/4G	B)	G/4
C)	4G	D)	None of these
Correct Answer:	C		
34)	Which of the following has the highest electrical conductivity?		
A)	Copper	B)	Titanium
C)	Mercury	D)	Silver
Correct Answer:	D		
35)	What is the total resistance when 5 resistors of 4 Ω each are connected in series?		
A)	20 Ω	B)	9 Ω
C)	1.2 Ω	D)	0.8 Ω
Correct Answer:	A		

36)	A material is said to have Positive temperature coefficient if _____		
A)	the material experiences a decrease in electrical resistance when their temperature is raised	B)	the material experiences an increase in electrical resistance when their temperature is raised
C)	the material experiences no change in electrical resistance when their temperature is raised	D)	the materials experiences an increase in magnetic flux when their temperature is raised
Correct Answer:	B		
37)	A particular circuit has four resistances 100 Ω, 50 Ω, 25 Ω and X Ω connected in parallel. Current through 25 Ω resistance is 4 A. If the total current is 15 A, what is the current through the resistance X Ω?		
A)	4A	B)	15A
C)	8A	D)	None of these
Correct Answer:	C		
38)	What is the capacitance when a capacitor carries a charge of 0.6 C at 30 V?		
A)	2 F	B)	0.2 F
C)	0.02 F	D)	None of these
Correct Answer:	C		
39)	Consider a parallel plate capacitor with a capacitance of 4 Farads. What is the capacitance of the capacitor if the area of the plates is doubled and the distance between them is reduced by half?		
A)	16 F	B)	8 F
C)	2 F	D)	None of these
Correct Answer:	A		
40)	What is the total resistance when 5 resistors of 4 Ω each are connected in parallel?		
A)	20 Ω	B)	9 Ω
C)	1.2 Ω	D)	0.8 Ω
Correct Answer:	D		
41)	What is the charge on each capacitor when 300 V is applied across a series combination of 5 µF and 10µF?		
A)	100 µF	B)	1000 µF
C)	1000F	D)	None of these
Correct Answer:	B		
42)	Consider a condenser of capacitance 4 micro farad where the distance between the plates is 10 mm. What is the change in the capacitance when distance between the 2 plates of is reduced from 10 mm to 2 mm?		
A)	20 micro farad	B)	10 micro farad
C)	16 micro farad	D)	None of these
Correct Answer:	C		
43)	The capacitance of a capacitor is affected by which of the following?		
A)	Area of the plates	B)	Distance between the plates
C)	Both A and B	D)	None of these
Correct Answer:	C		

44)	What is the phase difference when two sinusoidal quantities are in phase quadrature?		
A)	180^0	B)	90^0
C)	60^0	D)	45^0
Correct Answer:	B		
45)	What is the frequency when one cycle of AC wave form occurs every 2 milli seconds?		
A)	1000 Hz	B)	500 Hz
C)	50 Hz	D)	2000 Hz
Correct Answer:	B		
46)	Kirchhoff's current law (KCL) is applicable to networks that are _____		
A)	unilateral or bilateral	B)	active or passive
C)	linear or non-linear	D)	all the above
Correct Answer:	D		
47)	What is the number of independent loop equations in a circuit with 12 branches and 7 nodes?		
A)	5	B)	6
C)	12	D)	7
Correct Answer:	B		
48)	A single phase watt meter with a meter constant of 400 makes 2070 revolutions while operating on 230 V and 12.5 A for 2 hours. What is the power factor?		
A)	0.8	B)	0.9
C)	9.2	D)	None of these
Correct Answer:	B		
49)	Which of the following is true with power factor?		
A)	It is a dimensionless number	B)	It is the ratio between real power and apparent power
C)	Both A and B	D)	None of these
Correct Answer:	C		
50)	When a watt meter consists of two pressure coils (voltage coils), they _____		
A)	can be connected in series only	B)	can be connected in parallel only
C)	can be connected in series or parallel	D)	cannot be connected at all
Correct Answer:	C		
51)	The process by which electrons and electron holes are created and eliminated is called _____		
A)	recreation	B)	creative destruction
C)	recurrent elimination	D)	recombination
Correct Answer:	D		
52)	What is the hexadecimal equivalent of decimal number 155?		
A)	90	B)	9A
C)	9C	D)	None of these
Correct Answer:	D		

53)	What is the maximum number of memory locations that can be accessed by 8 address bits?		
A)	255	B)	256
C)	512	D)	511
Correct Answer:	B		
54)	What is the SI unit for inductance?		
A)	Coulomb	B)	Faraday
C)	Ampere/Joule	D)	Henry
Correct Answer:	D		
55)	What is one Henry equal to?		
A)	Joule/Ampere^2	B)	Ohm.Second
C)	Weber/Ampere	D)	All the above
Correct Answer:	D		
56)	What are the majority charge carriers in n-type semiconductors?		
A)	Holes	B)	Electrons
C)	Both holes and electrons	D)	Silicon atoms
Correct Answer:	B		
57)	Which of the following is used as a pentavalent impurity?		
A)	Arsenic	B)	Bismuth
C)	Phosphorus	D)	All the above
Correct Answer:	D		
58)	When a continuous quantity is represented by a discrete function which can only take on one of a finite number of values is called		
A)	Analog signal	B)	Digital signal
C)	Both analog and digital signal	D)	Function signal
Correct Answer:	B		
59)	What is a Darlington transistor?		
A)	It is a compound structure consisting of two bipolar transistors	B)	A configuration but with transistors of opposite type (one NPN and one PNP)
C)	Both A and B	D)	None of these
Correct Answer:	A		
60)	What is a chopper?		
A)	It is a switching device that converts fixed AC input to a variable DC output voltage directly	B)	It is a switching device that converts fixed DC input to a variable DC output voltage directly
C)	It is a switching device that converts fixed DC input to a variable AC output voltage directly	D)	It is a switching device that converts fixed AC input to a variable AC output voltage directly
Correct Answer:	B		
61)	Which of the following is true with respect to Schottky diode?		
A)	It has a low forward voltage drop	B)	It has a very slow switching action
C)	Both A and B	D)	None of these
Correct Answer:	A		

62)	Direct conversion of temperature differences to electric voltage and vice versa is known as _____		
A)	Seebeck effect	B)	Thermoelectric effect
C)	Both A and B	D)	None of these
Correct Answer:	C		
63)	Which of the following is used in Type T thermocouples?		
A)	Platinum-Rhodium	B)	Platinum-Copper
C)	Copper-Constantan	D)	Rhodium-Iron
Correct Answer:	C		
64)	What happens to the conductivity of semiconductors when temperature increases?		
A)	It decreases	B)	It increases
C)	It does not change	D)	It becomes zero
Correct Answer:	B		
65)	Which of the following are responsible for electrical conductivity of an element?		
A)	Valance electrons	B)	Protons
C)	Neutrons	D)	All the above
Correct Answer:	A		
66)	Which of the following allotropes of carbon is a good conductor of electricity?		
A)	Diamond	B)	Graphite
C)	Both A and B	D)	None of these
Correct Answer:	B		
67)	Which of the following is a universal gate?		
A)	XOR	B)	NAND
C)	XNOR	D)	All the above
Correct Answer:	B		
68)	How many junctions and terminals does a silicon controlled rectifier has?		
A)	Three junctions and two terminals	B)	Two junctions and three terminals
C)	Two junctions and two terminals	D)	Three junctions and three terminals
Correct Answer:	D		
69)	Which of the following plants have the lowest operational and maintenance costs?		
A)	Nuclear power plant	B)	Hydroelectric plant
C)	Thermal power plant	D)	Diesel power plant
Correct Answer:	B		
70)	Pelton wheels are most efficient under the conditions of _____		
A)	High pressure and high flow	B)	Low pressure and low flow
C)	Low pressure and high flow	D)	High pressure and low flow
Correct Answer:	D		

71)	Which of the following is an example of impulse turbine?		
A)	Pelton wheel	B)	Tyson turbine
C)	Kaplan turbine	D)	All the above
Correct Answer:	A		
72)	What is the total resistance of a series circuit consisting of three resistors with values of 200 Ω , 230 Ω , and 170 Ω ?		
A)	600 Ω	B)	1200 Ω
C)	300 Ω	D)	None of these
Correct Answer:	A		
73)	A circuit having 4 equal value resistors connected in series. If the total power is 40 watts, what is the dissipation of each of them?		
A)	40 W	B)	10 W
C)	160 W	D)	None of these
Correct Answer:	B		
74)	What is the SI unit for magnetic moment?		
A)	Tesla	B)	Newton-meter/Tesla
C)	Newton-meter	D)	Ampere/Tesla
Correct Answer:	B		
75)	What is the SI unit for magnetic reluctance?		
A)	Tesla	B)	Henry
C)	$Tesla^{-1}$	D)	$Henry^{-1}$
Correct Answer:	D		
76)	During a "Sale Period", Shoppers Stop announces a 20% discount on the price of all of its products. This results in an increase of the sales volume by 25%. What is the net effect on the revenue because of the discount?		
A)	Increase of 5%	B)	Decrease of 5%
C)	Increase of 10%	D)	Revenue remains constant
Correct Answer:	D		
77)	The worth of a transformer depreciates at the rate of 5% every year as compared to its value in the previous year. If the present worth is Rs. 60,00,000, what was its worth when the transformer was bought by the firm 4 years back (the answers are rounded off to the nearest thousand)?		
A)	Rs. 51,08,000	B)	Rs. 72,93,000
C)	Rs. 51,44,000	D)	Rs. 48,87,000
Correct Answer:	B		
78)	What is the next number of the series: 2, 6, 14, 26, 42, 62,		
A)	82	B)	80
C)	86	D)	None of the above
Correct Answer:	C		
79)	Which of the following countries is a member of the United Nations Security Council?		
A)	Republic of China	B)	People's Republic of China
C)	India	D)	Germany
Correct Answer:	B		

80)	Identify the odd one out?		
A)	Ganga	B)	Mahanadi
C)	Godavari	D)	Krishna
Correct Answer:	C		
81)	The capital of Assam is		
A)	Guwahati	B)	Dispur
C)	Tinsukia	D)	None of the above
Correct Answer:	B		
82)	The sum of two numbers is 40 and the difference is 12. What is the value of the smaller number of the two?		
A)	14	B)	26
C)	12	D)	10
Correct Answer:	A		
83)	Who succeeded Morarji Desai as the Prime Minister of India?		
A)	Indira Gandhi	B)	Rajiv Gandhi
C)	Charan Singh	D)	None of the above
Correct Answer:	C		
84)	The minimum educational qualification to contest for the post of member of Legislative Assembly in any state of India is		
A)	Graduate	B)	Post Graduate
C)	SSLC or its equivalent	D)	None of these
Correct Answer:	D		
85)	A circular field has a diameter of 14 meters. The field is divided in to four separate quadrants. What is the cost of fencing all the four quadrants at Rs. 100 per meter?		
A)	Rs. 10,000	B)	Rs. 2500
C)	Rs. 7200	D)	Rs. 4400
Correct Answer:	A		
86)	A solid cube with each side being of length 8 inches was painted violet, indigo and yellow on pair of opposite faces. It is then cut into 1 inch cubes. How many of the small one – inch cubes have exactly 4 faces painted?		
A)	16	B)	8
C)	4	D)	None of these
Correct Answer:	D		
87)	The national game of India is		
A)	Cricket	B)	Football
C)	Kabaddi	D)	Hockey
Correct Answer:	D		
88)	Victoria Terminus can be found at		
A)	Mumbai	B)	Bangalore
C)	Chennai	D)	Kolkata
Correct Answer:	A		

89)	If you cut a bar magnet into half, the pole strength of each piece		
A)	Becomes half	B)	Remains the same
C)	Becomes double	D)	Becomes zero
Correct Answer:	B		
90)	Identify the correct combination?		
A)	Gol Gumbaz – Hassan	B)	Gomateshwara statue – Shravan Belagola
C)	Bannerghatta National Park – Hubli	D)	Lalbagh - Gulbarga
Correct Answer:	B		
91)	Who was the first vice president of India?		
A)	Dr. Rajendra Prasad	B)	Sarvapalli Radhakrishnan
C)	Hamid Ansari	D)	R. Venkatraman
Correct Answer:	B		
92)	Two dice are tossed. The probability that the total score is a multiple of 3 is:		
A)	(1/6)	B)	(1/3)
C)	(1/2)	D)	(7/9)
Correct Answer:	B		
93)	A 1 kilometre long train passes through a tunnel of 2 kilometre length at a speed of 1 kilometre per minute. What will be the minimum time taken for the train to inside the tunnel completely?		
A)	1 minute	B)	2 minutes
C)	3 minutes	D)	4 minutes
Correct Answer:	B		
94)	If the radius of a circle is decreased by 6%, the area of the circle		
A)	Decreases by 12.36%	B)	Decreases by 11.64%
C)	Does not change at all	D)	None of the above
Correct Answer:	B		
95)	The total of the ages of Amar, Akbar and Anthony is 80 years today. If Amar's age is 25 today, what was the total of the ages of Akbar and Anthony three years ago?		
A)	49 years	B)	55 years
C)	46 years	D)	None of the above
Correct Answer:	A		
96)	The telephone was invented by		
A)	Alexander Graham Bell	B)	J. Kepler
C)	D. Rutherford	D)	James Chadwick
Correct Answer:	A		
97)	Consider a ray standing on a line. The sum of the two adjacent angles is		
A)	Greater than a straight angle	B)	Less than a straight angle
C)	Equal to a straight angle	D)	None of the above
Correct Answer:	C		

98)	A man's basic pay for 40 hours' week is Rs. 200. Overtime is paid at 25% of the basic rate. In certain week, he has worked overtime and his total earning is Rs. 300. He therefore, worked for a total of (in hours)		
A)	52	B)	56
C)	58	D)	62
Correct Answer:	B		
99)	Who has been the youngest person to have ever become a Chief Minister of any state in India?		
A)	H D Kumaraswamy	B)	Akhilesh Yadav
C)	Mamata Bannerjee	D)	Omar Abdullah
Correct Answer:	B		
100)	Louis Phillippe had given a discount of 10% of the marked price of a shirt. If the cost price of the shirt is Rs. 8000 and Louis Phillippe made a profit of 12.5 percent in the transaction, what is the marked price of the shirt?		
A)	Rs. 1100	B)	Rs. 1000
C)	Rs. 1200	D)	None of these
Correct Answer:	Question Dropped		