Please read the instructions carefully before attending the Question paper. All Questions are compulsory.

1.	A 3-phase induction motor is running at 2% slip. If the input to rotor is 1000 **W**, then mechanical power developed by the motor is (A) 20 W (B) 980 W (C) 500 W (D) 200 W
2.	High-speed alternators are driven by (A) diesel engines (B) hydraulic turbines (C) steam turbines (D) None of the above
3.	Ideal voltage source have (A) zero internal resistance (B) infinite internal resistance (C) low value of current (D) large value of e.m.f.
4.	Water hammer occurs in (A) surge tank (B) penstock (C) turbine (D) draft tube
5.	The opposite of susceptibility is (A) Immunity (B) Emission (C) Interference (D) Electromagnetic compatibility
6.	Any electrical signal present in a circuit other than the desired signal is known as (A) Noise (B) Distortion (C) Interference (D) All of these
7.	The string efficiency of a string of suspension insulators is dependent on (A) size of insulators (B) number of discs in the string (C) size of tower (D) none of the above
8.	A 50 Hz, 4-pole single-phase induction motor will have a synchronous speed of (A) 1500 r.p.m. (B) 750 r.p.m. (C) 1200 r.p.m. (D) none of the above
9.	A circuit breaker is a (A) current controlling device (B) circuit interrupting device (C) current limiting device (D) none of the above
10.	An overcurrent relay having current setting of 125% is connected to a supply circuit through a current transformer of 400/5 A. The pick-up current is (A) 6.25 A (B) 12.5 A (C) 3.125 A (D) 25 A
11.	The arc voltage in a circuit breaker (A) is in phase with arc current (B) lags arc current by 90° (C) leads arc current by 90° (D) lags arc current by 180°
12.	When 3-phase system is balanced, the neutral wire carries (A) no current (B) one-third of current for each phase (C) half of current for each phase (D) none of the above
13.	Which of the following has highest permeability? (A) Paramagnetic material (B) Diamagnetic material (C) Ferromagnetic material (D) Vacuum

14.	Load factor of a power station is defined as			
	(A)	maximum demand / average load	(B)	average load X maximum demand
	(C)	average load / maximum demand	(D)	(average load X maximum demand)^{½}
15.	The phenomenon of rise in voltage at the receiving end of the open-circuited or lightly loaded line is called the			
	(A)	Seebeck effect	(B)	Ferranti effect
	(C)	Raman effect	(D)	None of the above
16.	There is a greater possibility of occurrence of corona during			
	(A)	dry weather	(B)	winter
	(C)	summer heat	(D)	humid weather
17.	In a single phase induction motor running at a slip of 5 % with reference to forward field, the slip with reference to backward field is			
	(A)	0	(B)	0.95
	(C)	1.95	(D)	2.0
18.	An electric iron drawing 9 A from 120 V supply mains is operated for 20 minutes, the energy consumed is			
	(A)	1080 W	(B)	3 Ah
	(C)	0.6 kWh	(D)	360 Wh
19.	If the capacitance of a system is doubled, then its energy stored becomes			
	(A)	2 times	(B)	unaltered
	(C)	4 times	(D)	none of the above
20.	An unsaturated shunt motor runs at its rated speed when rated voltage is applied to it. If the supply voltage to the motor is reduced by 25% the speed of the motor			
	(A)	increases by 25%	(B)	remains the same
	(C)	decreases by 25%	(D)	increases slightly
21.	A power plant operates at an annual load factor of 80% with an average load of 120 MW. If the load factor falls to 60%, the average load on the plant would be			
	(A)	200 MW	(B)	160 MW
	(C)	90 MW	(D)	72 MW
22.	The following electrical measuring instrument depend on chemical effect for its action			
	(A)	Ammeter	(B)	Voltmeter
	(C)	D.C. Ampere - Hour meter	(D)	None of the above
23.	Following parameter(s) may affect the performance of a motor			
	(A)	Voltage unbalance & Voltage variation	(B)	System harmonics
	(C)	Altitude & Ambient temperature	(D)	All of the above
24.	When load is removed _____motor will run at the highest speed.			
	(A)	Series	(B)	Shunt
	(C)	Cumulative compound	(D)	Differential compound
25.	A series motor is best suited for driving			
	(A)	Lathes	(B)	Cranes and hoists
	(C)	Shears and punches	(D)	Machine tools

26. Which one of the following load would be best driven by a d.c. compound motor ?
(A) Reciprocation pump (B) Centrifugal pump
(C) Electric locomotive (D) Fan

27. As compared to underground system, the overhead system is
(A) more expensive (B) less flexible
(C) more flexible (D) None of the above

28. The electrical conductivity of metals is typically of the order of (in ohm $^{-1}$ m $^{-1}$)
(A) 10^{7} (B) 10^{5}
(C) 10^{-4} (D) 10^{-6}

29. An electromagnetic field is radiated from
(A) a stationery point charge (B) a capacitor with a d.c. voltage
(C) a conductor carrying a d.c. current (D) an oscillating dipole

30. A generating station has an installed capacity of 50,000 kW and delivers 220 X 10^{6} units per annum. If the annual fixed charges are Rs.160 per kW installed capacity and running charges are 4 paise per kWh, the cost per unit generated is
(A) 4.38 paise (B) 5.92 paise
(C) 7.64 paise (D) 11.72 paise

31. What is the efficiency of a power plant if the efficiencies of the boiler, turbine and generator are 88,40,and 98% respectively ?
(A) 88% (B) 40%
(C) 35% (D) 98%

32. A thermal generating station has an installed capacity of 15 MW and supplies a daily load of 10 MW for 12 hours and 5 MW for remaining 12 hours. The plant capacity factor for this station is
(A) 1 (B) 0.75
(C) 0.67 (D) 0.5

33. The no. of turns in a secondary coil is twice the number of turns in the primary. A cell of 1.5 **V** is connected across the primary. The voltage across the secondary is
(A) 1.5 **V** (B) 3 **V**
(C) 0.75 **V** (D) zero

34. A 100 MW power station delivers 100 MW for 2 hours. 50 MW for 6 hours and is shut down for the rest of each day. It is also shut down for maintenance for 45 days each year. Energy supplied per year is
(A) 12 X 10^{4} MWh (B) 8 X 10^{4} MWh
(C) 6 X 10^{5} MWh (D) 16 X 10^{4} MWh

35. The current taken from a 230 **V**, 50 **Hz** supply is measured as 10 **A** with a lagging p.f. of 0.7. A capacitor is connected in parallel with the load. The true power
(A) increases (B) decreases
(C) remains unchanged (D) cannot be predicted

36. The normal current in a power line is 100 **A**. If a short-circuit fault occurs on the line, then one can expect the short-circuit current to be
(A) 200 A (B) 300 A
(C) more than 1000 A (D) 100 A

37. A 132 kV transmission line uses strings of insulators, each insulator rated at 25 kV. The string efficiency can be maximum of 60%. The least number of insulators required in a string is
(A) 10 (B) 9
(C) 8 (D) 6

38. A 3-phase induction motor draws a current of 50 **A** from mains when started by direct switching. If an auto transformer with 60% tapping is used for starting, the current drawn from the mains will be
(A) 50 A (B) 18 A
(C) 36 A (D) 83.3 A

39. A power plant with a load factor of 0.5 produces energy of 16,000 MWh with a maximum demand of 8000 kW over a time period. For how many hours has the plant been in operation ?
(A) 8000 hrs. (B) 4000 hrs.
(C) 8760 hrs. (D) 1000 hrs.

40. Brass will have relative permeability, μ_r, equal to
(A) 2000 (B) 0
(C) 1 (D) 1000

41. An RLC circuit has a resonance frequency of 160 kHz and a Q-factor of 100. Its band width is
(A) 1.6 kHz (B) 0.625 kHz
(C) 16 MHz (D) None of these

42. A parallel plate air capacitor has a capacitance of 100 pfd. A p.d of 50 **V** is applied. The stored energy is …… joules.
(A) 1.25×10^{-7} (B) 2.50×10^{-7}
(C) 40×10^{-9} (D) 20×10^{-9}

43. In the following Bus active and reactive powers are not specified
(A) Load Bus (B) Generator Bus
(C) Slack Bus (D) None of the above

44. The meter that is suitable for only direct current measurements is
(A) Moving-iron type (B) Permanent-magnet type
(C) Electrodynamic type (D) Hot-wire type

45. Merz-Price circulating current principles is more suitable for
(A) Generators (B) Transformers
(C) Both (A) & (B) (D) None of the above

46. A.C. Potentiometer can be used for the following
(A) Voltmeter calibration (B) Ammeter calibration
(C) Testing of energy meters and wattmeter (D) All of the above

47. An inverter circuit is employed to convert
(A) a.c. voltage into d.c. voltage (B) d.c. voltage into a.c. voltage
(C) high frequency into low frequency (D) low frequency into high frequency

48. A short circuit between one line and ground, very often caused by physical contact is known as
(A) Single-Line-to-Ground-Fault (B) Line-to-line Fault
(C) Double line-to- Ground-Fault (D) None of the above

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49.	The following contact is largely used for low-voltage oil circuit breaker (A) Tulip type contacts (B) Finger and wedge contacts (C) Butt Contact (D) None of the above
50.	An alternator is supplying a load of 300 kW at a p.f. of 0.6 lagging. If the p.f. is raised to unity, how many more kW can alternator supply? (A) 200 kW (B) 100 kW (C) 300 kW (D) 150 kW
51.	A distribution transformer costing Rs. 50,000 has a salvage value of Rs. 5000. If annual depreciation charge is Rs. 3000 on straight line method, the useful life of the transformer is (A) 10 years (B) 15 years (C) 5 years (D) 25 years
52.	The most efficient form of damping employed in electrical instruments is (A) Air friction (B) Fluid friction (C) Eddy currents (D) None of the above
53.	An industrial installation has a power factor of 0.8 lagging. It would be economical to improve pf to (A) unity (B) about 0.8 lagging (C) about 0.95 lagging (D) about 0.95 leading
54.	Compared to steam engines, the internal combustion engines have (A) much higher thermal efficiency (B) almost same thermal efficiency as that of steam engines (C) much lower thermal efficiency (D) can have lower or higher thermal efficiency
55.	a 1000 kVA transformer has a reactance of 5%. Its reactance at 2000 kVA base is (A) 5% (B) 2.5% (C) 20% (D) 10%
56.	If the percentage reactance of the system up to the fault point is 20% and base kVA is 10000, then short-circuit kVA is (A) 10,000 kVA (B) 50,000 kVA (C) 500 kVA (D) 30,000 kVA
57.	In a hydroelectric project, catchment area = 5 X 10^9 m^2; annual rainfall = 1.25 m and yield factor = 80%. The volume of water which can be utilized per annum is (A) 2.5 X10^7 m^3 (B) 5 X 10^9 m^3 (C) 6.5 X 10^8 m^3 (D) 7.5 X 10^6 m^3
58.	A steam power station has an overall efficiency of 20% and 0.6 kg of coal is burnt per kWh of electrical energy generated. The calorific value of fuel is (A) 7166 kcal/kg (B) 5152 kcal/kg (C) 2458 kcal/kg (D) none of the above
59.	An energy meter having a meter constant of 1200 rev. per kWh is found to make 5 revolutions in 75 seconds. The load power is (A) 500 W (B) 100 W (C) 200 W (D) 1000 W

60.	If the insulation resistance of a cable of length 10 km is 1 MΩ, its insulation resistance for 50 km length will be (A) 0.2 MΩ (B) 2 MΩ (C) 4 MΩ (D) 8 MΩ
61.	In a 3-wire d.c. system, the load on the +ve side is 400 A and on -ve side it is 300 A. Then current in neutral wire is (A) 50 A (B) 100 A (C) 350 A (D) 150 A
62.	The voltage drop is the main consideration while designing a (A) feeder (B) service mains (C) distributor (D) none of the above
63.	The transient phenomenon lasts in a power system for a period ranging from (A) few ms to 1 s (B) 1 s to 2 s (C) 2 s to 3 s (D) greater than 3 s
64.	The feeder is designed mainly from the point of view of (A) its current carrying capacity (B) voltage drop in it (C) operating voltage (D) operating frequency
65.	If the fault current is 2000 A, the relay setting 50% and C.T. ratio is 400/5, the plug setting multiplier will be (A) 15 (B) 10 (C) 25 (D) 50
66.	The time-current graph of a fuse (A) has linear characteristic (B) is a circle (C) has inverse characteristic (D) none of the above
67.	An over-excited synchronous motor behaves as ……. (A) a resistor (B) an inductor (C) a capacitor (D) None of the above
68.	The resistance between any two terminals of a balanced delta-connected load is 12Ω. The resistance of each phase is (A) 12 Ω (B) 18 Ω (C) 6 Ω (D) 36 Ω
69.	Bulk power transmission over long HVDC lines are preferred on account of (A) low cost of HVDC terminals (B) no harmonic problems (C) minimum line power losses (D) simple protection
70.	Which of the following capacitors preferred for high frequency circuits? (A) Air capacitor (B) Electrolytic capacitor (C) Mica capacitor (D) None of the above
71.	Lenz's law is consequence of the law of conservation of (A) induced current (B) charge (C) energy (D) induced e.m.f.

72.	Which of the following relays is used on long transmission lines? (A) Impedance relay (B) Mho's relay (C) Reactance relay (D) None of the above
73.	During a test on 6 kVA transformer it is found that iron losses are 120 **W**, full load copper losses are 200 **W**. The total losses at half full load will be (A) 80 W (B) 160 W (C) 320 W (D) 170 W
74.	A delta-delta, 3-phase transformer bank will have a phase shift between the primary and secondary voltages of (A) 0° (B) 30° (C) 90° (D) -30°
75.	A transformer gives maximum efficiency when it operates at full load. Total losses at full load are 400 W. Copper losses at half load are (A) 200 W (B) 400 W (C) 100 W (D) 50 W
76.	Two bulbs which are identical consume 50 watts each when connected in parallel across a 100 **V** source. If the bulbs are connected in series across the same supply, they consume (A) 100 W (B) 50 W (C) 75 W (D) 25 W
77.	In an AC circuit, the current & voltage are out of phase by 90 degrees. The ammeter reads 2**A** and voltmeter reads 1000 **V**. The power consumed is (A) zero (B) 2000 W (C) 1000 W (D) 180 W
78.	The transformer has turns ratio of 4 : 1. The resistance of the HV winding is 8 ohms and that of the LV winding is 1 ohm. The total resistance on HV side in ohms is (A) 9 (B) 8.25 (C) 24 (D) 9.5
79.	The pitch of Arc with 96 stator slots and 6 pole is (A) 36 (B) 16 (C) 48 (D) 32
80.	Which of the following is moderator in a nuclear power reactor? (A) Beryllium (B) Plutonium (C) Cadmium (D) Thorium
81.	Three balanced delta-connected resistors consume a power of 1500 W from a symmetrical 3-phase supply. If these resistors are reconnected in star across the same supply, the power consumed would be (A) 1500 W (B) 4500 W (C) 500 W (D) 1000 W
82.	In a series circuit, under resonant condition, the following quantities are maximum (A) Voltage and Current (B) Current and Power factor (C) Impedance and Current (D) Impedance and Power factor

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83.	A transformer 2000 kVA, 250 Hz is operated at 50 Hz, kVA rating should be revised to (A) 20,000 kVA (B) 400 kVA (C) 10,000 kVA (D) same
84.	A d-c shunt motor runs at rated speed. If its field circuit gets open circuited, the motor speed (A) decreases drastically (B) remains unchanged (C) increases dangerously (D) fluctuates around its previous speed
85.	Hay's bridge is particularly useful for measuring (A) inductive impedance with large phase angle (B) mutual inductance (C) self-inductance (D) capacitance and dielectric loss
86.	The fact that a conductor carries more current on the surface as compared to core, is known as (A) Skin effect (B) Corona (C) Permeability (D) Unsymmetrical fault
87.	The following is not a basic element of a transformer (A) Primary winding (B) Secondary winding (C) Mutual flux (D) Core
88.	The medium used for arc extinction in ABCB is (A) Oil (B) Air (C) SF_6 (D) Vacuum
89.	A low oil circuit breaker has the following advantage over a bulk oil circuit breaker (A) It requires a small space (B) The degree of carbonization is increased (C) Maintenance problems are increased (D) None of the above
90.	A wave winding must go at least _____around the armature before it closes back where it started. (A) once (B) twice (C) thrice (D) four times
91.	A four-speed squirrel cage induction motor uses …… stator windings. (A) four (B) three (C) one (D) two
92.	A voltmeter gives 120 oscillations per minute when connected to the rotor of an induction motor. The supply frequency is 50 Hz. The slip of the motor is (A) 2% (B) 5% (C) 25% (D) 4%
93.	An overhead line conductor has a cross sectional area of 3.2 cm^2. It is supported on level supports of a span of 150 m. The specific weight of the conductor is 7800 kg/m^3, and the working stress is 1050 kg/cm^2. What is the working tension? (A) 1560 kg (B) 2416 kg (C) 3360 kg (D) 986 kg
94.	The rotor voltage of a slip-ring induction motor gives 120 oscillations per minute when the motor is connected to 3-phase, 50Hz supply. The percentage slip of the rotor is (A) 2 (B) 4 (C) 5 (D) 6

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95.	Two coils have inductance L_1= 1200 mH and L_2 = 800 mH. They are connected in such a way that flux in the two coils aid each other and inductance is measured to be 2500 mH then Mutual inductance between the coils is …… mH.			
	(A)	200	(B)	150
	(C)	225	(D)	250
96.	The name given to that property of a material which opposes the creation of magnetic flux in it is known as			
	(A)	Reluctance	(B)	Resistance
	(C)	Permeance	(D)	None of the above
97.	A network is said to be nonlinear if it does not satisfy			
	(A)	superposition condition	(B)	homogeneity condition
	(C)	both superposition and homogeneity conditions	(D)	associative condition
98.	Transmission efficiency increases as			
	(A)	voltage and power factor both increase	(B)	voltage and power factor both decrease
	(C)	voltage increases but power factor decreases	(D)	voltage decreases but power factor increases
99.	Q meters works on the principles of			
	(A)	Self-inductance	(B)	Series resonance
	(C)	Stray magnetization	(D)	Corona effect
100.	The circuit breaker must have the following rating(s)			
	(A)	breaking capacity	(B)	making capacity
	(C)	short-time capacity	(D)	all of the above

************ BEST OF LUCK ************

Date
09.10.2016

Questions
100

Written test for the post of Vidyut Sahayak - Answer Key SET A (VS JE – 161021_A)

1.	**B**	51.	**B**
2.	**C**	52.	C
3.	**A**	53.	**C**
4.	**B**	54.	**A**
5.	**A**	55.	**D**
6.	**A**	56.	**B**
7.	**B**	57.	**B**
8.	**A**	58.	**A**
9.	**B**	59.	**C**
10.	**A**	60.	**A**
11.	**A**	61.	**B**
12.	**A**	62.	**C**
13.	**C**	63.	**A**
14.	**C**	64.	**A**
15.	**B**	65.	**B**
16.	**D**	66.	**C**
17.	**C**	67.	**C**
18.	**D**	68.	**B**
19.	**A**	69.	**C**
20.	**C**	70.	**C**
21.	**C**	71.	**C**
22.	C	72.	**B**
23.	D	73.	**D**
24.	A	74.	**A**
25.	B	75.	**D**
26.	A	76.	**D**
27.	**C**	77.	**A**
28.	**A**	78.	**C**
29.	**D**	79.	**B**
30.	**C**	80.	**A**
31.	**C**	81.	**C**
32.	**D**	82.	**B**
33.	**D**	83.	**B**
34.	**D**	84.	**C**
35.	**C**	85.	A
36.	**C**	86.	A
37.	**B**	87.	C
38.	**B**	88.	B
39.	**B**	89.	A
40.	**C**	90.	B
41.	**A**	91.	**D**
42.	**A**	92.	**D**
43.	C	93.	**C**
44.	B	94.	**B**
45.	A	95.	**D**
46.	D	96.	A
47.	B	97.	C
48.	A	98.	A
49.	B	99.	B
50.	**A**	100.	D