

Question Paper with Final (Revised) Answer Key for the Post of Assistant Engineer (Electrical) held on 14-11-2019	
Itemcode : EL1001	
Q1: The connected load of a consumer is 2 kW and his maximum demand is 1.5 kW. The load factor of the consumer is:	
A	0.75
B	0.375
C	1.33
D	none of these.
Correct Ans: D	

Itemcode : EL1002	
Q2: It is always economical to improve power factor of an installation to:	
A	zero
B	unity
C	a little less than unity lag
D	a little less than unity lead
Correct Ans: C	

Itemcode : EL1003	
Q3: If a plant has zero reserve capacity, the plant load factor always:	
A	equals to the plant capacity factor
B	is greater than the plant capacity factor
C	is less than the plant capacity factor
D	any of these is possible
Correct Ans: A	

Itemcode : EL1004	
Q4: For a particular kW rating of an induction motor, the kVAR rating of the shunt capacitor required is:	
A	more for higher rated speed motor
B	more for lower rated speed motor
C	independent of speed
D	always zero
Correct Ans: B	

Itemcode : EL1005	
Q5: The ring main system is usually used for:	
A	urban areas
B	rural areas
C	both for urban and rural areas

D	None of these
Correct Ans: A	

<u>Itemcode</u> : EL1006	
Q6: Which of the following is considered a superior quality of coal:	
A	Peat
B	Coke
C	Bituminous
D	Lignite
Correct Ans: C	

<u>Itemcode</u> : EL1007	
Q7: Low frequency operation of overhead line in traction system:	
A	reduces the spacing between substations
B	increases the spacing between substations
C	spacing is independent of frequency of supply
D	None of these
Correct Ans: B	

<u>Itemcode</u> : EL1008	
Q8: The overall thermal efficiency of a thermal power plant lies in the range:	
A	20% to 25%
B	30% to 40%
C	45% to 60%
D	65% to 80%
Correct Ans: B	

<u>Itemcode</u> : EL1009	
Q9: Run-away speed of a Pelton wheel is:	
A	full load speed
B	actual speed operating at no load
C	no load speed when governor mechanism fails
D	80% greater than the normal speed
Correct Ans: C	

<u>Itemcode</u> : EL1010	
Q10: Which of the following material is used as a moderator:	
A	Graphite
B	Boron

C	Sodium potassium liquid
D	plutonium
Correct Ans: A	

<u>Itemcode</u> : EL1011	
Q11: Current taken by 80 watt fluorescent lamp will be:	
A	equal to that of 80 watt filament lamp
B	less than that of 80 watt filament lamp
C	more than that of 80 watt filament lamp
D	none of these is necessary
Correct Ans: C	

<u>Itemcode</u> : EL1012	
Q12: The efficiency of electrostatic precipitator is as high as:	
A	99.6%
B	90%
C	85%
D	80%
Correct Ans: A	

<u>Itemcode</u> : EL1013	
Q13: Steel rails are welded by:	
A	Argon arc welding
B	Thermit welding
C	Gas welding
D	resistance welding
Correct Ans: B	

<u>Itemcode</u> : EL1014	
Q14: Hydrogen when used for cooling a large alternator has a pressure inside:	
A	0.01 kg/cm ²
B	0.02 kg/cm ²
C	0.035 kg/cm ²
D	none of these
Correct Ans: C	

<u>Itemcode</u> : EL1015	
Q15: The windage friction and iron loss are more when an induction machine is operated as:	
A	an induction motor

B	an induction generator
C	the losses are same for both the machines
D	none of these is necessary
Correct Ans: B	

<u>Itemcode</u> : EL1016	
Q16: High frequency induction heating is used for:	
A	ferrous metals only
B	non-ferrous metals only
C	both ferrous and non-ferrous metals
D	none of these
Correct Ans: C	

<u>Itemcode</u> : EL1017	
Q17: In case of three-phase slip ring induction motor, as the rotor resistance is increased, the starting torque:	
A	increases
B	decreases
C	increases up to certain value of resistance and then remains constant
D	increases up to certain value of resistance and then decreases
Correct Ans: D	

<u>Itemcode</u> : EL1018	
Q18: A three-phase delta connected squirrel cage induction motor when started with D.O.L. starter has a starting torque of 600 Nm. Its starting torque when star-delta starter is used, would be:	
A	600 Nm
B	200 Nm
C	300 Nm
D	none of these
Correct Ans: B	

<u>Itemcode</u> : EL1019	
Q19: The heating time constant of a totally enclosed motor is relatively:	
A	higher
B	lower
C	independent of type of enclosure
D	None of these
Correct Ans: A	

<u>Itemcode</u> : EL1020	
Q20:	

A single-phase full convertor is connected across 250 volt ac. Its output voltage when firing angle is 30° , is given by:	
A	210 volt
B	195 volt
C	250 volt
D	none of these
Correct Ans: B	

Itemcode : EL1021	
Q21: Electric potential is:	
A	a scalar quantity
B	a vector quantity
C	a phasor quantity
D	none of these
Correct Ans: A	

Itemcode : EL1022	
Q22: The dielectric that would make a capacitor to have lowest capacitance is:	
A	air
B	paper
C	plastic
D	mica
Correct Ans: A	

Itemcode : EL1023	
Q23: At geomagnetic poles, the angle of dip is:	
A	45°
B	30°
C	zero
D	90°
Correct Ans: D	

Itemcode : EL1024	
Q24: Which one of the following materials is ferromagnetic?	
A	aluminium
B	quartz
C	nickel
D	bismuth
Correct Ans: C	

Itemcode : **EL1025****Q25:** The resistance of a conductor, when its temperature is increases:

- | | |
|----------|---------------------|
| A | remains constant |
| B | decreases |
| C | increases |
| D | may be any of these |

Correct Ans: **C**Itemcode : **EL1026****Q26:** The total capacitance of 5 capacitors, each of $10\mu\text{F}$, connected in series is:

- | | |
|----------|-----------------|
| A | $50\mu\text{F}$ |
| B | $25\mu\text{F}$ |
| C | $2\mu\text{F}$ |
| D | none of these |

Correct Ans: **C**Itemcode : **EL1027****Q27:** The charging of a capacitor through a resistance follows:

- | | |
|----------|-----------------|
| A | linear law |
| B | exponential law |
| C | square law |
| D | none of these |

Correct Ans: **B**Itemcode : **EL1028****Q28:** In the analysis of a PNP transistor circuit we usually apply:

- | | |
|----------|-----------------------|
| A | Norton's theorem |
| B | Thevenin's theorem |
| C | reciprocity theorem |
| D | superposition theorem |

Correct Ans: **S** (**S Denotes question scrapped and no credit to Candidates.**)Itemcode : **EL1029****Q29:** If a copper rod carries a direct current, the magnetic field associated with the current will be:

- | | |
|----------|----------------------|
| A | only inside the rod |
| B | only outside the rod |
| C | |

	both inside and outside the rod
D	neither inside nor outside the rod
Correct Ans: C	

Itemcode : EL1030	
Q30: The current passing through a choke coil of 5 henry is decreasing at a rate of 2 A/s. The emf developed across the coil is:	
A	10 Volt
B	7 Volt
C	2.5 Volt
D	- 2.5 volt
Correct Ans: A	

Itemcode : EL1031	
Q31: For greater accuracy, the value of phase angle (Φ) should be determined from:	
A	$\cos \Phi$
B	$\tan \Phi$
C	$\sin \Phi$
D	$\sec \Phi$
Correct Ans: B	

Itemcode : EL1032	
Q32: IN an RC series circuit $X_C = R$. The phase angle between applied voltage and the circuit current is:	
A	45°
B	30°
C	60°
D	90°
Correct Ans: A	

Itemcode : EL1033	
Q33: If in an RLC series circuit the frequency is below the resonant frequency, then:	
A	$X_C = X_L$
B	$X_C > X_L$
C	$X_C < X_L$
D	may be any of these
Correct Ans: B	

Itemcode : **EL1034**

Q34: In a three-phase power measurement by two wattmeter method, both wattmeters read the same value. The power factor of the load must be:

- | | |
|----------|---------------|
| A | unity |
| B | zero |
| C | 0.707 lagging |
| D | 0.707 leading |

Correct Ans: **A**

Itemcode : **EL1035**

Q35: The armature of a dc machine is made up of laminated sheets in order to:

- | | |
|----------|----------------------------------|
| A | reduce the armature copper loss |
| B | reduce eddy-current loss |
| C | reduce hysteresis loss |
| D | increase the dissipation of heat |

Correct Ans: **B**

Itemcode : **EL1036**

Q36: A single phase transformer is supplying power to a load at a terminal voltage of 11kV. When the load is disconnected, the terminal voltage becomes 11,550 volt. The voltage regulation of this transformer for this load will be:

- | | |
|----------|--------|
| A | 55% |
| B | 5% |
| C | 2.5% |
| D | 11.55% |

Correct Ans: **B**

Itemcode : **EL1037**

Q37: A 4-pole, 1200 rpm alternator will generate emf at a frequency of:

- | | |
|----------|-------|
| A | 60 Hz |
| B | 50 Hz |
| C | 40 Hz |
| D | 25 Hz |

Correct Ans: **C**

Itemcode : **EL1038**

Q38: The motor used in a ceiling fan is:

- | | |
|----------|-----------------------|
| A | split-phase motor |
| B | capacitor-start motor |
| C | shaded-pole motor |

D ac series motor

Correct Ans: **S** (S Denotes question scrapped and no credit to Candidates.)

Itemcode : **EL1039**

Q39: Following is true for an open loop control system:

A the components used need to be more accurate

B most of the systems are stable

C the output need not be measured

D all of these

Correct Ans: **D**

Itemcode : **EL1040**

Q40: Laplace transform of the function e^{-2t} is:

A $\frac{1}{s-2}$

B $\frac{1}{s+2}$

C $\frac{1}{s^2-2}$

D $\frac{1}{s+1}$

Correct Ans: **B**

Itemcode : **EL1041**

Q41: The Laplace transform of $f(t)$ is given to be $F(s)$, What would be the Laplace transform of $f(t - k)$?

A $F(s) - k(s)$

B $e^{-ks} F(s)$

C $k F(s)$

D $\frac{1}{k} F(s)$

Correct Ans: **B**

Itemcode : **EL1042**

Q42: The validity of a linearized model of a non-linear model:

A is in the neighbourhood of a given operating condition

B is in the full range of independent variables

C has no relation to the range of independent variables

D none of these

Correct Ans: **A**

Itemcode : **EL1043**

Q43: Block diagram of a control system is:

- | | |
|----------|---|
| A | an algebraic representation of the system |
| B | a pictorial representation of the system |
| C | a graphical representation of the system |
| D | all of these |

Correct Ans: **B**

Itemcode : **EL1044**

Q44: In a signal flow graph representation, a loop consisting of a single branch and a single node is known as:

- | | |
|----------|-------------------|
| A | non-touching loop |
| B | touching-loop |
| C | self-loop |
| D | mixed-loop |

Correct Ans: **C**

Itemcode : **EL1045**

Q45: Kirchhoff's voltage law states that in a closed loop:

- | | |
|----------|--|
| A | the total current, algebraically summed is zero |
| B | the algebraic sum of the potential differences is zero |
| C | the voltages across the components is zero |
| D | none of these |

Correct Ans: **B**

Itemcode : **EL1046**

Q46: Which of the following forces is not a subject of mechanical translational systems:

- | | |
|----------|---------------------|
| A | spring force |
| B | inertia force |
| C | electromotive force |
| D | damping force |

Correct Ans: **C**

Itemcode : **EL1047**

Q47: The resolution of a multi-turn potentiometer having 500 turns is:

- | | |
|----------|------|
| A | 0.2% |
| B | 5% |
| C | 0.5% |

D	2%
Correct Ans: A	

Itemcode : EL1048	
Q48: An ac servomotor is a:	
A	Single-phase motor
B	two-phase motor
C	three-phase motor
D	can be any of these
Correct Ans: B	

Itemcode : EL1049	
Q49: The overall transfer function of a positive unity feedback system with forward path transfer function G is:	
A	$\frac{1}{1+G}$
B	$\frac{G}{1+G}$
C	$\frac{1}{1-G}$
D	$\frac{G}{1-G}$
Correct Ans: D	

Itemcode : EL1050	
Q50: The steady state error due to a unit-step input to a type 1 system is:	
A	$\frac{1}{k_p}$
B	$\frac{1}{1+k_p}$
C	∞
D	zero
Correct Ans: D	

Itemcode : EL1051	
Q51: Reset control is the name given to:	
A	proportional control
B	derivative control

C	rate control
D	integral control
Correct Ans: D	

Itemcode : EL1052	
Q52: The closed loop transfer function of a linear time-invariant system has multiple poles on $j\omega$ axis. Comment on the stability of the system:	
A	stable
B	unstable
C	marginally stable
D	relatively stable
Correct Ans: B,C	

Itemcode : EL1053	
Q53: The breakaway point/s on the root-loci of a polynomial equation can occur:	
A	on the real axis only
B	either on real axis or on $j\omega$ -axis
C	anywhere on the complex plane
D	on $j\omega$ -axis only
Correct Ans: C	

Itemcode : EL1054	
Q54: The phase angle of the transfer function $(1 + j\omega\tau)^{-N}$ in the low frequency range is near to:	
A	- 180°
B	- N 180°
C	- N 90°
D	0°
Correct Ans: D	

Itemcode : EL1055	
Q55: The independent parameter in the Nyquist plot is/are:	
A	Magnitude of $G(j\omega)$
B	Phase of $G(j\omega)$
C	both Magnitude of $G(j\omega)$ and Phase of $G(j\omega)$
D	frequency ω
Correct Ans: D	

Itemcode : **EL1056****Q56:** The ratio of reset to pick up current for an induction cup relay is approximately:

- | | |
|----------|---------------|
| A | 0.99 |
| B | 1.01 |
| C | 0.75 |
| D | none of these |

Correct Ans: **A**Itemcode : **EL1057****Q57:** The most suitable C.B. for short line fault without switching resistor is:

- | | |
|----------|----------------------|
| A | air blast C.B. |
| B | M.O.C.B. |
| C | SF ₆ C.B. |
| D | none of these |

Correct Ans: **C**Itemcode : **EL1058****Q58:** Shunt compensation in an EHV is resorted to:

- | | |
|----------|--|
| A | improve the stability |
| B | reduce the fault level |
| C | improve the voltage profile |
| D | as a substitute for synchronous phase modifier |

Correct Ans: **C**Itemcode : **EL1059****Q59:** A mho relay is a :

- | | |
|----------|---|
| A | voltage restrained directional relay |
| B | voltage controlled over current relay |
| C | directional restrained over current relay |
| D | directional restrained over voltage relay |

Correct Ans: **A**Itemcode : **EL1060****Q60:** The velocity of travelling wave through a cable of relative permittivity 9 is:

- | | |
|----------|-----------------------|
| A | 9×10^8 m/sec |
| B | 3×10^8 m/sec |
| C | 10^8 m/sec |
| D | 2×10^8 m/sec |

Correct Ans: **C**Itemcode : **EL1061**

Q61: An overhead line with surge impedance 400 ohms is terminated through a resistance R. A surge travelling over the line does not suffer any reflection at the junction if the value of R is:

- | | |
|----------|---------------|
| A | 20 ohms |
| B | 200 ohms |
| C | 800 ohms |
| D | none of these |

Correct Ans: **D**Itemcode : **EL1062**

Q62: Phase modifier is normally installed in case of:

- | | |
|----------|--------------------------|
| A | short transmission lines |
| B | medium length lines |
| C | long length lines |
| D | for all length lines |

Correct Ans: **C**Itemcode : **EL1063**

Q63: The presence of earth in case of overhead lines:

- | | |
|----------|---------------------------|
| A | increases the capacitance |
| B | increases the inductance |
| C | decreases the capacitance |
| D | decreases the inductance |

Correct Ans: **A**Itemcode : **EL1064**

Q64: The capacitance and inductance per unit length of a line operating at 110 kV are 0.01 μF and 2 mH respectively. The surge impedance loading of the line is:

- | | |
|----------|---------------|
| A | 40 MVA |
| B | 30 MVA |
| C | 27 MVA |
| D | none of these |

Correct Ans: **C**Itemcode : **EL1065**

Q65: For effective application of counterpoise, it should be buried into the ground to a depth of:

- | | |
|----------|-----|
| A | 1 m |
| B | 2 m |

C	just enough to avoid theft
D	none of these
Correct Ans: C	

<u>Itemcode</u> : EL1066	
Q66: If r is the radius of conductor and R the radius of the sheath of a cable, the cable operates stably from the view point of dielectric strength if:	
A	$\frac{r}{R} > 1.0$
B	$\frac{r}{R} < 1.0$
C	$\frac{r}{R} < 0.632$
D	$\frac{r}{R} < 0.368$
Correct Ans: D	

<u>Itemcode</u> : EL1067	
Q67: The order of lightning discharge current is:	
A	10,000 Amp.
B	100 Amp.
C	1 Amp.
D	1 mAmp
Correct Ans: A	

<u>Itemcode</u> : EL1068	
Q68: The unit protection scheme provides:	
A	primary protection
B	back up protection
C	simultaneous protection
D	remote protection
Correct Ans: A	

<u>Itemcode</u> : EL1069	
Q69: SSR phenomenon is:	
A	purely electrical
B	purely mechanical
C	purely hydraulic
D	both purely electrical and purely mechanical

Correct Ans: **D**

Itemcode : **EL1070**

Q70: For a long uncompensated line the limit to the line loading is governed by:

- | | |
|----------|-----------------|
| A | thermal limit |
| B | voltage drop |
| C | stability limit |
| D | corona loss |

Correct Ans: **C**

Itemcode : **EL1071**

Q71: With 100% inductive shunt compensation the voltage profile is flat for:

- | | |
|----------|----------------------|
| A | 100% loading of line |
| B | 50% loading of line |
| C | zero loading of line |
| D | none of these |

Correct Ans: **C**

Itemcode : **EL1072**

Q72: In a pure LC parallel circuit under resonance condition, current drawn from the supply mains is:

- | | |
|----------|-----------------------|
| A | very large |
| B | $V \sqrt{LC}$ |
| C | $\frac{V}{\sqrt{LC}}$ |
| D | zero |

Correct Ans: **D**

Itemcode : **EL1073**

Q73: In a circuit the voltage and current are given by $\mathbf{V} = (10 + j5)$ and $\mathbf{I} = (6 + j4)$, the real power in the circuit is:

- | | |
|----------|----------|
| A | 60 watts |
| B | 20 watts |
| C | 80 watts |
| D | 40 watts |

Correct Ans: **C**

Itemcode : **EL1074**

Q74: The insulation of modern EHV lines is designed based on:

- | | |
|----------|-----------------------|
| A | the lightning voltage |
| B | corona |

C	radio interference
D	switching voltage
Correct Ans: D	

<u>Itemcode</u> : EL1075	
Q75: In a 400 kV power network, 360 kV is recorded at 400 kV bus. The reactive power absorbed by a shunt reactor rated for 50 MVAR, 400 kV connected at the bus is:	
A	61.73 MVAR
B	55.56 MVAR
C	45 MVAR
D	40.5 MVAR
Correct Ans: D	

<u>Itemcode</u> : EL1076	
Q76: Lightning arresters are used in power system to protect electrical equipment against:	
A	direct strokes of lightning
B	power frequency over voltages
C	over voltages due to indirect lightning stroke
D	over currents due to lightning stroke
Correct Ans: A	

<u>Itemcode</u> : EL1077	
Q77: For a transmission line with resistance R, reactance X and negligible capacitance, the transmission constant A is:	
A	0
B	1
C	$R + jX$
D	$R + X$
Correct Ans: B	

<u>Itemcode</u> : EL1078	
Q78: Impulse ratio of insulators and lightning arresters should be:	
A	both low
B	high and low respectively
C	low and high respectively
D	both high
Correct Ans: B	

<u>Itemcode</u> : EL1079	
Q79: A power plant has a maximum demand 15 MW. The load factor is 50% and the plant factor is 40%. The	

operating reserve is	
A	3.0 MW
B	3.75 MW
C	6.0 MW
D	7.5 MW
Correct Ans: B	

<u>Itemcode</u> : EL1080	
Q80: When a line to ground fault occurs, the current in a faulted phase is 100 A. The zero sequence current in this case will be:	
A	zero
B	33.3 A
C	66.6 A
D	100 A
Correct Ans: B	

<u>Itemcode</u> : EL1081	
Q81: According to 2011 census which district of H.P. has the highest percentage of S.T. population as percentage proportion to H.P.?	
A	Kangra
B	Kinnaur
C	Chamba
D	Kullu
Correct Ans: C	

<u>Itemcode</u> : EL1082	
Q82: According to official data which district of H.P. recorded the highest production of Potato during 2014-15?	
A	Shimla
B	Mandi
C	Sirmour
D	Kullu
Correct Ans: A	

<u>Itemcode</u> : EL1083	
Q83: In which district of H.P. is Lakshna Devi Temple?	
A	Kullu
B	Chamba
C	Kangra
D	Shimla

Correct Ans: **B**Itemcode : **EL1084****Q84:** In which month is religious function Jidjed celebrated in H.P.?**A** April**B** June**C** July**D** OctoberCorrect Ans: **D**Itemcode : **EL1085****Q85:** With which region of H.P. is Bakayang dance associated?**A** Una**B** Solan**C** Bilaspur**D** KinnaurCorrect Ans: **D**Itemcode : **EL1086****Q86:** Which Superintendent of Shimla Hill States conceived the Nalwari fair of Bilaspur, H.P.?**A** W. Goldstein**B** J.P. Thompson**C** P.S.M. Burlton**D** J.A.O. FitzpatrickCorrect Ans: **A**Itemcode : **EL1087****Q87:** What is the subject of nearly 600 manuscripts that the H.P. Language, Art and Culture Academy found in Spiti valley around 2011 AD?**A** Hill architecture**B** Hill folk dances**C** Old coins**D** Ayurvedic system of medicineCorrect Ans: **D**Itemcode : **EL1088****Q88:** Ancient tribe Audumbaras were descendents of sage_____ .**A** Vashishtha**B** Bhrigu**C** Vishwamitra

D	Gautama
Correct Ans: C	

<u>Itemcode</u> : EL1089	
Q89: Who was the last Quiladar of Kangra fort?	
A	Nawab Sail Alikhan
B	Alif Khan
C	Azim Khan
D	Mian Khan
Correct Ans: A	

<u>Itemcode</u> : EL1090	
Q90: Who was the first Speaker of H.P. Vidhan Sabha in 1952?	
A	Krishan Chander
B	Jaiwant Ram
C	Vidya Dhar
D	Des Raj Mahajan
Correct Ans: B	

<u>Itemcode</u> : EL1091	
Q91: State emblem of India is adaptation of Lion Capital of Ashoka at _____.	
A	Sanchi
B	Sarnath
C	Patliputra
D	Gaya
Correct Ans: B	

<u>Itemcode</u> : EL1092	
Q92: When was the National Livestock Mission launched in India?	
A	2009-10
B	2011-12
C	2014-15
D	2015-16
Correct Ans: C	

<u>Itemcode</u> : EL1093	
Q93: When did National Health policy recommend the introduction of Yoga in the school curriculum?	
A	2015
B	2016

C	2017
D	2018
Correct Ans: C	

<u>Itemcode</u> : EL1094	
Q94: Who ruled over Lakshadweep before it became a part of the Indian Union?	
A	France
B	Britain
C	Portugal
D	Netherlands
Correct Ans: B	

<u>Itemcode</u> : EL1095	
Q95: Among the following who was the shortest serving Prime Minister of India?	
A	V.P. Singh
B	I.K. Gujral
C	Chandra Shekhar
D	Charan Singh
Correct Ans: D	

<u>Itemcode</u> : EL1096	
Q96: What is the capital of Laos?	
A	Vientiane
B	Pakse
C	Vila
D	Phnom-penh
Correct Ans: A	

<u>Itemcode</u> : EL1097	
Q97: Which is the smallest (in area) country in the world?	
A	Monaco
B	Nauru
C	Tuvalu
D	Vatican city
Correct Ans: D	

<u>Itemcode</u> : EL1098	
Q98: Who is the author of A Suitable Boy ?	
A	Vikram Seth

B	V.S. Naipaul
C	Anita Desai
D	Jean Dreze
Correct Ans: A	

Itemcode : EL1099	
Q99: World Standards Day is to be observed in 2020 on October _____?	
A	09
B	14
C	24
D	30
Correct Ans: B	

Itemcode : EL1100	
Q100: The final of 2019 ODI Cricket World Cup was played between England and _____.	
A	South Africa
B	India
C	West Indies
D	New Zealand
Correct Ans: D	