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## PROVISIONAL ANSWER KEY

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| Name of the post                 | Assistant Engineer (Electrical), Class-2, Gandhinagar Municipal Corporation |
| Advertisement No.                | 31/2024-25  |
| Preliminary Test Held On         | 29-12-2024  |
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| Last Date to Send Suggestion (s) | 21-01-2025  |

THE LINK FOR ONLINE OBJECTION SYSTEM WILL START FROM 18-01-2025; 10:00 AM ONWARDS

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Candidate must ensure compliance to the instructions mentioned below, else objections shall not be considered: -

- (1) Candidates have to pay fees of Rs.100/- for each objection. The fees can be paid from the link given herewith.
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- (5) All objections are to be submitted with reference to the Master Question Paper published with provisional answer key, published herewith on the website / online objection submission system. Objections should be sent referring to the Question No. & options of the Master Question Paper. Objections regarding question nos. and options other than provisional answer key (Master Question Paper) shall not be considered.
- (6) Objections and answers suggested by the candidate should be in compliance with the responses given by him in his answer sheet. Objections shall not be considered, in case, if responses given in the answer sheet /response sheet and submitted objections are differed.
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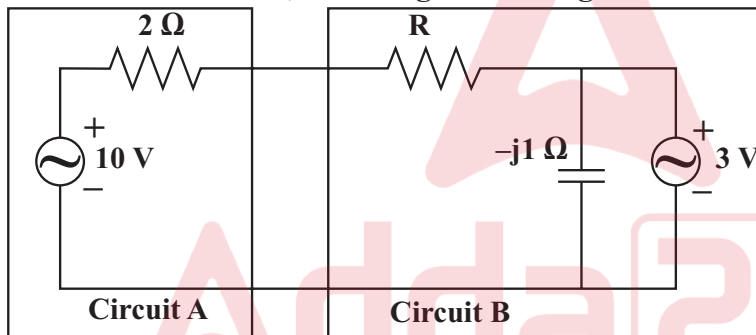
ઉમેદવારે નીચેની સૂચનાઓનું પાલન કરવાની તકેદારી રાખવી, અન્યથા વાંધા-સૂચન અંગે કરેલ રજૂઆતો ધ્યાને લેવાશે નહીં

- (1) ઉમેદવારે દરેક વાંધા દીઠ રૂપિયા ૧૦૦/- ફી ભરવાની રહેશે. જે ફી આ સાથે આપેલ લીંક ઉપરથી ભરી શકાશે.
- (2) ફી ભર્યા બાદ જ વાંધો સબમીટ થઈ શકશે. ફી ભર્યાની આખરી પહોંચ જ આખરી સબમીશન ગણાશે.
- (3) ફી ભર્યાની પહોંચ ઉમેદવારે સાચવી રાખવાની રહેશે. એક વાર ભરેલ ફી કોઈ પણ પરિસ્થિતિમાં પરત આપવામાં આવશે નહિ.
- (4) વાંધા ફક્ત **ઓનલાઇન ઓબ્જેક્શન સબમીશન સીસ્ટમ** દ્વારા જ સબમીટ કરવાના રહેશે. રૂબરૂ, ટપાલ અથવા ઇ-મેઇલ કે અન્ય કોઈ રીતે આયોગને મોકલવામાં આવેલ વાંધા ધ્યાને લેવામાં આવશે નહીં, જેની ખાસ નોંધ લેવી.
- (5) ઉમેદવારે પોતાને પરીક્ષામાં મળેલ પ્રશ્નપુસ્તિકામાં છપાયેલ પ્રશ્નક્રમાંક મુજબ વાંધા-સૂચનો રજૂ ન કરતાં, તમામ વાંધા-સૂચનો વેબસાઇટ પર પ્રસિધ્ધ થયેલ પ્રોવિઝનલ આન્સર કી (માસ્ટર પ્રશ્નપત્ર) ના પ્રશ્નક્રમાંક મુજબ અને તે સંદર્ભમાં રજૂ કરવા. માસ્ટર પ્રશ્નપત્રમાં નિર્દિષ્ટ પ્રશ્ન અને વિકલ્પ સિવાયના વાંધા ધ્યાને લેવામાં આવશે નહીં.
- (6) ઉમેદવારે પ્રશ્નના વિકલ્પ પર વાંધો રજૂ કરેલ છે અને વિકલ્પ રૂપે જે જવાબ સૂચવેલ છે એ જવાબ ઉમેદવારે પોતાની ઉત્તરવહીમાં આપેલ હોવો જોઈએ. ઉમેદવારે સૂચવેલ જવાબ અને ઉત્તરવહીનો જવાબ ભિન્ન હશે તો ઉમેદવારે રજૂ કરેલ વાંધા ધ્યાને લેવાશે નહીં.
- (7) વાંધા માટે સંદર્ભ જોડવો આવશ્યક છે, જેના વિના વાંધો ધ્યાને લેવામાં આવશે નહીં.

Website link for online objection submission system: [https://www.formonline.co.in/GPSC\\_TRACK/SearchPage.aspx](https://www.formonline.co.in/GPSC_TRACK/SearchPage.aspx)

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- Given two continuous time signals  $x(t) = e^{-t}$  and  $y(t) = e^{-2t}$  which exist for  $t > 0$ , what is the convolution value of  $z(t) = x(t) * y(t)$ ?  
 (A)  $e^{-t} + e^{-2t}$  (B)  $e^{-t} - e^{-2t}$   
 (C)  $e^{+t}$  (D)  $e^{-3t}$
- What should be the minimum sampling rate to avoid aliasing when a continuous time signal  $x(t) = 5 \cos 400\pi t$  is to be discretized?  
 (A) 100 Hz (B) 250 Hz  
 (C) 400 Hz (D) 20 Hz
- The process of converting analog signal into discrete form is called \_\_\_\_\_.  
 (A) Sampling  
 (B) Modulation  
 (C) Quantization  
 (D) Demultiplexing
- What is the value of R in the circuit given below to transfer the maximum power from circuit A to circuit B, assuming both voltage sources in the figure below are in phase?



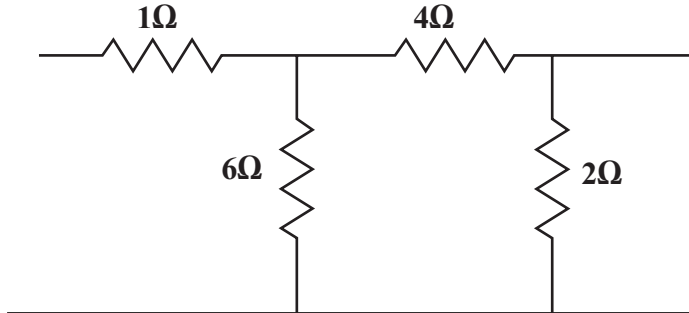
- (A) 2.0 Ω (B) 1.2 Ω  
 (C) 1.0 Ω (D) 0.8 Ω
- A network consists of only independent current sources and resistors. If the values of all the current sources are doubled, then what will be the values of node voltages?  
 (A) will remain same.  
 (B) will be halved.  
 (C) will be doubled.  
 (D) will change in some other way.
- A certain current source has the values of current  $I_s = 4\mu\text{A}$  and resistance  $R_s = 1.2\text{M}\Omega$ . What are the values voltage  $V_s$  and resistance  $R_s$  of an equivalent voltage source?  
 (A) 1 V, 1.2 MΩ (B) 4.8 V, 1.2 MΩ  
 (C) 4.8 μV, 1.2 MΩ (D) 4.8 V, 4.8 MΩ

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7. A voltage source of 18 V has an internal resistance of  $70\Omega$ . If a load resistance of  $33\Omega$  is connected to the voltage source, then what will be the load power  $P_L$ ?
- (A) 1 W (B) 18 mW  
(C) Zero (D) 175 mW
8. What is the period of signal  $x(t) = 8 \sin(0.8\pi t + \frac{\pi}{4})$ ?
- (A)  $0.8\pi$  s (B) 2.5 s  
(C)  $0.4\pi$  s (D) 1.25 s
9. A  $680\Omega$  load resistor ( $R_L$ ) is connected across a constant current source of 1.2A having internal source resistance,  $R_s$  of  $12\text{ k}\Omega$ . What will be the load current  $I_L$ ?
- (A) Zero (B) 1.2 A  
(C) 0.766 A (D) 1.14 A
10. Consider a star network in which three resistances  $R_a$ ,  $R_b$  and  $R_c$  are connected to terminals A, B and C respectively. The resistance between terminals A and B with C open is  $6\Omega$ , between B and C with A open is  $11\Omega$  and between C and A with B open is  $9\Omega$ . Then
- (A)  $R_a = 4\Omega$ ,  $R_b = 2\Omega$ ,  $R_c = 5\Omega$   
(B)  $R_a = 3\Omega$ ,  $R_b = 3\Omega$ ,  $R_c = 4\Omega$   
(C)  $R_a = 2\Omega$ ,  $R_b = 4\Omega$ ,  $R_c = 7\Omega$   
(D)  $R_a = 5\Omega$ ,  $R_b = 1\Omega$ ,  $R_c = 10\Omega$
11. If a square wave is integrated by an integrator using an Op-Amp circuit, then what will be the output signal waveform?
- (A) Ramp (B) Triangular wave  
(C) Sine wave (D) None of these
12. If a capacitor is placed in the feedback path of an Op-Amp Circuit, then the circuit can act as \_\_\_\_\_.
- (A) Integrator (B) Multiplier  
(C) Divider (D) Subtractor
13. The Schmitt trigger circuit is a modification of which of the following multivibrators?
- (A) Universal multivibrator  
(B) Monostable multivibrator  
(C) Bistable multivibrator  
(D) Astable multivibrator

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14. What will be the value of the  $Z_{12}$  parameter in the circuit given below?



- (A)  $1\Omega$  (B)  $2\Omega$   
(C)  $3\Omega$  (D)  $3.5\Omega$
15. If a two-port network is reciprocal, which of the following relationship is correct?  
(A)  $h_{12} = h_{21}$  (B)  $h_{12} = -h_{21}$   
(C)  $h_{22} = h_{11}$  (D)  $h_{11}h_{22} - h_{12}h_{21} = 1$
16.  $F(s)$  is the Laplace transform of the function  $f(t) = 2t^2 e^{-t}$ , then  $F(1)$  is \_\_\_\_\_.  
(A) 2 (B) 1  
(C) 0.3 (D) 0.5
17. If a current of 5A flows through a resistor of  $12\Omega$ , then the power developed and the energy dissipated in 2 minutes are \_\_\_\_\_.  
(A) 380 W, 30000 J (B) 300 W, 30000 J  
(C) 360 W, 30000 J (D) 300 W, 36000 J
18. Specific resistance of a material is \_\_\_\_\_.  
(A) directly proportional to both the area of cross-section and length of material.  
(B) directly proportional to the area of cross-section and inversely proportional to the length of material.  
(C) inversely proportional to the area of cross-section and directly proportional to the length of material.  
(D) inversely proportional to the both area of cross-section and length of material.
19. An inductor of reactance  $1\Omega$  and resistance  $2\Omega$  is connected in series to the terminal of  $6V_{rms}$  AC source. The power dissipated in the circuit is \_\_\_\_\_.  
(A) 4 W (B) 8 W  
(C) 14.4 W (D) 61.3 W

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20. In an L-C-R circuit, alternating voltage (V) and current (I) are given by  $V = V_0 \sin \omega t$  and  $I = I_0 \sin (\omega t + \frac{\pi}{3})$ . The average power dissipated in the circuit over a cycle is \_\_\_\_\_.
- (A)  $\frac{V_0 I_0}{4}$  (B)  $\frac{V_0 I_0}{2}$   
(C) Zero (D)  $\frac{\sqrt{3} V_0 I_0}{4}$
21. What is maximum limit of earth leakage current (for single fault condition) as per International Standard IEC60601-1?
- (A) 2 mA (B) 1 mA  
(C) 1 A (D) 0.1 mA
22. Which size wire has the highest current carrying capacity?
- (A) 4 gauge (B) 10 gauge  
(C) 12 gauge (D) 18 gauge
23. Fuse is connected \_\_\_\_\_.
- (A) in series with the circuit  
(B) in parallel with the circuit  
(C) either in series or parallel with the circuit  
(D) to bypass the load
24. A switchgear is a device used for \_\_\_\_\_.
- (A) interrupting an electrical circuit  
(B) switching an electrical circuit  
(C) switching and controlling an electrical circuit  
(D) switching, controlling and protecting the electrical circuit and equipment
25. In a step-down transformer, the primary winding has \_\_\_\_\_.
- (A) the same number of turns as the secondary  
(B) fewer turns than the secondary  
(C) more turns than the secondary  
(D) number of turns do not matter
26. The efficiency of a Power Transformer is \_\_\_\_\_ at full load.
- (A) same (B) minimum  
(C) maximum (D) fluctuates

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27. Which of the following devices is typically used in DC-DC converters to control the output voltage?  
(A) Diode (B) MOSFET  
(C) Transformer (D) Resistor
28. What is the primary function of a power converter?  
(A) To increase voltage only  
(B) To convert electrical energy from one form to another  
(C) To store electrical energy  
(D) To decrease voltage only
29. What is the main advantage of using a synchronous motor over an induction motor?  
(A) Higher starting torque  
(B) Lowest Cost  
(C) Constant speed operation under varying loads  
(D) Simplicity in design
30. Which of the following machines operates on the principle of electromagnetic induction?  
(A) DC Generator (B) Synchronous Motor  
(C) Induction Motor (D) All of the above
31. In a transformer short circuit test, the current  $I_{sc}$  is \_\_\_\_\_.  
(A) equal to rated current  
(B) less than rated current  
(C) more than rated current  
(D) depends on transformer design
32. In winding design, the angle of chording ( $\beta$ ) is nearly equal to \_\_\_\_\_.  
(A) 45 degree (B) 30 degree  
(C) 60 degree (D) 90 degree
33. Calculate the torque developed by a 3-phase, 400V, 50 Hz, 5 HP, 4-pole Induction Motor runs at 1500 rpm.  
(A) 23 N-m (B) 21 N-m  
(C) 0 N-m (D) 10 N-m
34. Auto-transformer starter gives the same effect as star/delta starter if its turn ratio is \_\_\_\_\_.  
(A) 0.33 (B) 0.66  
(C) 0.57 (D) 0.7

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35. In an ideal transformer, no load primary current  $I_0$  \_\_\_\_\_.
- (A) lags behind  $V_1$  by 90 degree                      (B) leads  $V_1$  by 90 degree  
(C) is in the phase with  $V_1$                               (D) lags  $V_1$  by 45 degree
36. A T-T connection transformer cannot be operated in parallel with \_\_\_\_\_ transformer.
- (A) V-V    (B) Star-delta  
(C) Star-star    (D) Delta-delta
37. The Transformer will operate at maximum efficiency when \_\_\_\_\_.
- (A) hysteresis loss = eddy current loss  
(B) eddy current loss = copper loss  
(C) copper loss = iron loss  
(D) hysteresis loss = copper loss
38. In a transformer, if iron losses and copper losses are 40.5 kW and 50 kW respectively, then at what fraction of load will the efficiency be maximum?
- (A) 0.9    (B) 0.81  
(C) 0.66    (D) 0.5
39. A capacitor start and run Induction Motor has \_\_\_\_\_ as compared to capacitor start Induction Motor.
- (A) more over load capacity  
(B) good power factor and high efficiency  
(C) silent operation  
(D) all of these
40. A salient pole Synchronous Machine feeds from infinite bus & running at no load, and if its field current reduced to zero then motor would \_\_\_\_\_.
- (A) stop  
(B) run at synchronous speed  
(C) run below synchronous speed  
(D) run above synchronous speed
41. An alternator generates power at 210 V per phase while running at 1500 rpm. What will be the generated voltage per phase, if the speed of the alternator drops to 1000 rpm?
- (A) 140 V    (B) 180 V  
(C) 210 V    (D) 105 V

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42. Two synchronous generators  $G_1$  and  $G_2$  are equally sharing the kVAR of the load while operating in parallel. Keeping the terminal voltage fixed, what should be done to shift part of the kVAR load from  $G_2$  to  $G_1$ ?
- (A) The field current of  $G_1$  is lowered  
(B) The field current of  $G_2$  is raised  
(C) The field current of  $G_1$  is raised and  $G_2$  is lowered  
(D) The field current of  $G_1$  is lowered and  $G_2$  is raised
43. The Potier's triangle separates \_\_\_\_\_.
- (A) fixed losses and variable losses  
(B) armature leakage reactance and armature reaction m.m.f.  
(C) stator losses and rotor losses  
(D) armature voltage and field voltage
44. Open circuit characteristic of DC generator is a plot of \_\_\_\_\_.
- (A) load voltage Vs load current  
(B) terminal voltage Vs load current  
(C) terminal voltage Vs armature current  
(D) no load voltage Vs field current
45. The condition for maximum mechanical power development in a DC motor is that back EMF is equal to \_\_\_\_\_.
- (A) half the applied voltage  
(B) same as the applied voltage  
(C) twice the applied voltage  
(D) does not depend on applied voltage
46. For a second order over damped system, the poles are \_\_\_\_\_.
- (A) purely imaginary  
(B) complex conjugate of each other  
(C) real and equal  
(D) real and unequal
47. The characteristic equation of a closed loop system is given by  $s^4 + 6s^3 + 11s^2 + 6s + K = 0$ . The range of values of gain  $K$  for stable operation of closed loop system is \_\_\_\_\_.
- (A)  $0 < K < 10$   
(B)  $10 < K < 20$   
(C)  $-\infty \leq K < \infty$   
(D)  $K > 10$
48. In a linear time invariant system, an input of  $5 \sin \omega t$  produces an output of  $10 \cos \omega t$ . What would be the output corresponding to an input of  $10 \cos \omega t$ ?
- (A)  $5 \sin \omega t$   
(B)  $20 \sin \omega t$   
(C)  $-5 \sin \omega t$   
(D)  $-20 \sin \omega t$

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49. As compared to a closed loop system, an open loop system is \_\_\_\_\_.
- (A) Less stable but more accurate  
(B) More stable but less accurate  
(C) More stable and more accurate  
(D) Less stable and less accurate
50. The transfer function of a closed loop control system is  $\frac{2s^2 + 6s + 5}{(s + 1)^2 (s + 2)}$ . Then the characteristic equation of the system is given by \_\_\_\_\_.
- (A)  $2s^2 + 6s + 5 = 0$   
(B)  $2s^2 + 6s + 5 + (s + 1)^2 (s + 2) = 0$   
(C)  $(s + 1)^2 (s + 2) = 0$   
(D)  $2s^2 + 6s + 5 - (s + 1)^2 (s + 2) = 0$
51. The root locus always starts at the \_\_\_\_\_.
- (A) open loop poles  
(B) open loop zeros  
(C) closed loop poles  
(D) closed loop zeros
52. Which of the following is used for Nyquist plot?
- (A) Closed loop function.  
(B) Damped function.  
(C) Open loop function.  
(D) Characteristic function.
53. Gain Margin is the reciprocal of the gain at the frequency at which the phase angle becomes \_\_\_\_\_.
- (A)  $180^\circ$   
(B)  $90^\circ$   
(C)  $0^\circ$   
(D)  $270^\circ$
54. Electrical time-constant of an armature-controlled DC servomotor is \_\_\_\_\_.
- (A) equal to mechanical time-constant  
(B) larger than mechanical time-constant  
(C) not related to mechanical time-constant  
(D) smaller than mechanical time-constant.
55. In a Force-Current analogy, the capacitance of electrical system is analogous to \_\_\_\_\_ of mechanical system.
- (A) Velocity  
(B) Mass  
(C) Momentum  
(D) Displacement


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56. What is the formula for the force experienced by a charged particle in an electric field?  
(A)  $F = qE$  (B)  $F = qB$   
(C)  $F = q / E$  (D)  $F = q / B$
57. The divergence of a magnetic field in a region with no current is \_\_\_\_\_.  
(A) Zero (B) Constant  
(C) Non-zero and constant (D) Variable
58. The energy stored in an electromagnetic field is given by which of the following?  
(A)  $\frac{1}{2} \epsilon E^2$  (B)  $\frac{1}{2} \mu H^2$   
(C) Both A and B (D) None of the above
59. The Poynting vector represents \_\_\_\_\_.  
(A) The direction of the electric field  
(B) The direction of the magnetic field  
(C) The power flow per unit area  
(D) The electric potential
60. What does Gauss's law for electricity state?  
(A) The total electric flux through a closed surface is proportional to the enclosed electric charge  
(B) The total magnetic flux through a closed surface is zero  
(C) The electric field in free space is always zero  
(D) None of the above
61. Which law explains the relationship between electric current and magnetic field?  
(A) Faraday's Law (B) Coulomb's Law  
(C) Lenz's Law (D) Ampere's Circuital Law
62. Which of the following is a non-periodic signal?  
(A) Sinusoidal signal (B) Exponential signal  
(C) Triangular signal (D) Square wave signal
63. The Fourier Series is used for \_\_\_\_\_.  
(A) converting continuous to discrete signals  
(B) analyzing non-periodic signals  
(C) analyzing periodic signals  
(D) filtering noise from signals

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64. In signal processing, the Nyquist rate refers to \_\_\_\_\_.
- (A) twice the highest frequency present in the signal  
(B) the maximum sampling rate  
(C) the average sampling rate  
(D) the minimum sampling rate
65. A signal  $x(n)$  is periodic if \_\_\_\_\_.
- (A)  $x(n) = x(n - N)$  for all integer  $N$   
(B)  $x(n) = x(n + N)$  for all integer  $N$   
(C)  $x(n) = x(n - 1)$   
(D)  $x(n) = x(n + 1)$
66. Which Maxwell equation indicates that magnetic fields can be generated by changing electric fields?
- (A) Faraday's Law of Induction  
(B) Gauss's Law for Magnetism  
(C) Ampere's Circuital Law (with Maxwell's addition)  
(D) Gauss's Law for Electricity
67. What is the z transform of signal  $x[n] = a^n u[n]$
- (A)  $\frac{1}{1 - az}$  (B)  $\frac{z}{z - a}$   
(C)  $\frac{1}{1 - a^z}$  (D)  $\frac{1}{1 - az^{-1}}$
68. What does the term 'impulse response' refer to in signal processing?
- (A) The response to a sinusoidal input  
(B) The response to exponential input  
(C) The response to a delta input  
(D) The response to a step input
69. Which of the following represents the Fourier Transform of a rectangular pulse of duration  $T$ ?
- (A)  $\frac{1}{T}$  (B)  $T \cdot \text{Sinc}(fT)$   
(C)  $\text{Sinc}(T)$  (D)  $T \cdot \text{Sinc}(\pi fT)$
70. Which signal is obtained by sampling a continuous-time signal?
- (A) Discrete-time signal (B) Analog signal  
(C) Continuous-time signal (D) Digital signal

**M**

71. What is the factor deciding the thickness of conductor insulation?  
 (A) Voltage rating (B) Current rating  
 (C) Power rating (D) Frequency rating
72. What is the unit to express the rating of fuse wire?  
 (A) Volt (B) Ampere  
 (C) Watt (D) kWh
73. The fusing current for a round wire is proportional to (diameter)<sup>k</sup>, where the value of k is \_\_\_\_\_.  
 (A) 1 (B) -1  
 (C) 0.5 (D) 1.5
74. A circuit feeding single-phase motor should use \_\_\_\_\_.  
 (A) One fuse in phase and no fuse in neutral  
 (B) One fuse in phase and one fuse in neutral  
 (C) No fuse in phase and no fuse in neutral  
 (D) No fuse in phase and one fuse in neutral
75. As per the National Electrical Code of India 2023, the following graphical symbol represents \_\_\_\_\_.  
  
 (A) electric charging point (B) electric charging station  
 (C) electric vehicle parking shed (D) electric vehicle service station
76. For installation design as per the National Electrical Code of India 2023, what is the range of voltage between which the system of 415 V shall be capable of operating continuously?  
 (A) 405 V – 425 V (B) 394 V – 436 V  
 (C) 384 V – 446 V (D) 374 V – 457 V
77. Which of the following equipment are likely to cause harmonic current?  
 (A) Fluorescent and LED luminaries  
 (B) Variable Voltage Variable Frequency (VVVF) drives  
 (C) Inverter based air conditioners, washing machines and refrigerators  
 (D) All of the above

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78. Besides the requirement of estimated maximum load current under normal conditions, what other factor is/are considered while selecting the cross-sectional areas of conductor?
- (A) fault level withstand capacity  
(B) allowable voltage-drop  
(C) harmonic disturbances  
(D) All of the above
79. As per the National Electrical Code of India 2023, the nominal cross-section area of phase conductors of copper in AC circuits feeding 6A lighting point and 16A power point shall not be less than \_\_\_\_\_.
- (A)  $0.5 \text{ mm}^2$  and  $1.5 \text{ mm}^2$  respectively  
(B)  $1 \text{ mm}^2$  and  $2 \text{ mm}^2$  respectively  
(C)  $1.5 \text{ mm}^2$  and  $2.5 \text{ mm}^2$  respectively  
(D)  $2 \text{ mm}^2$  and  $3 \text{ mm}^2$  respectively
80. Which of the following is a function of powdered quartz filled in HRC fuse cartridge?
- (A) To help as a timer when the fusible element melts  
(B) To help to form a semiconductor  
(C) To help in quenching the arc  
(D) To make the fuse more transparent
81. The service value of a ceiling fan is measured in \_\_\_\_\_.
- (A)  $\text{mm}/\text{min}/\text{Wh}$  (B)  $\text{m}^3/\text{mm}/\text{Wh}$   
(C)  $\text{m}^3/\text{min}/\text{W}$  (D)  $\text{mm}/\text{min}/\text{W}$
82. Which of the following types of residual current device can detect a residual current containing the components of frequencies higher than 50Hz, the non-sinusoidal waveshapes, the waveshapes resulting from rectifying circuits with six diodes bridge, as well as smooth DC?
- (A) RCD Type A (B) RCD Type B  
(C) RCD Type AC (D) RCD Type F
83. Which of the following factors determine the severity of the shock?
- (A) The magnitude of the current  
(B) The parts of the body through which the current flows  
(C) The duration of the current flow  
(D) All of the above

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84. Long and hard shadows in lighting system design can be avoided by \_\_\_\_\_.
- (A) using wide surface sources of light  
(B) using indirect lighting  
(C) using proper mounting heights of lamp  
(D) all of the above
85. The illumination on the surface 1 meter away from the source of light is 36 lux. What must be the illumination on a surface 2 meter away from the same source?
- (A) 9 lux (B) 18 lux  
(C) 36 lux (D) 72 lux
86. A consumer always draws power at 0.8 lagging power factor. What kind of tariff will not motivate the consumer for power factor improvement?
- (A) kVAh billing (B) kWh + kVArh billing  
(C) kWh billing (D) none of the above
87. What is the effect of lagging low power factor and leading low power factor on the voltage at the point of application?
- (A) Decreased voltage & decreased voltage respectively  
(B) Decreased voltage & increased voltage respectively  
(C) Increased voltage & decreased voltage respectively  
(D) Increased voltage & increased voltage respectively
88. Which of the following methods offers a flexible, scalable solution for harmonic mitigation?
- (A) Use of reactors  
(B) Use of active harmonic filters  
(C) Use of passive harmonic filters  
(D) Use of transformers with special connections
89. Normally, where is the location of point of common coupling (PCC) between electricity supplier and consumer of the following type?
- (i) industrial user supplied via a dedicated service transformer  
(ii) commercial users e.g. office parks, malls, supplied via a common service transformer
- (A) (i) HV side of transformer; (ii) HV side of transformer  
(B) (i) HV side of transformer; (ii) LV side of transformer  
(C) (i) LV side of transformer; (ii) LV side of transformer  
(D) (i) LV side of transformer; (ii) HV side of transformer

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90. Under what condition, the switching of electric supply may be required?  
(A) no load condition (B) normal load condition  
(C) fault condition (D) all of the above
91. What is the minimum resistance offered by a human body?  
(A)  $10\Omega$  (B)  $100\Omega$   
(C)  $1\text{ k}\Omega$  (D)  $1\text{ M}\Omega$
92. If the velocity of wind is doubled, then the power output of a horizontal axis wind-turbine generator will \_\_\_\_\_.  
(A) increase by 2 times (B) increase by 4 times  
(C) increase by 6 times (D) increase by 8 times
93. What is full form of GTO in the context of thyristor classification?  
(A) Gate turn-off Thyristor (B) Gate trigger-on Thyristor  
(C) Gate testing-on Thyristor (D) Gate turn-on Thyristor
94. The Triac is equivalent to \_\_\_\_\_.  
(A) two SCRs connected in parallel  
(B) two SCRs connected in anti-parallel  
(C) one SCR, one diode connected in parallel  
(D) one SCR, one diode connected in anti-parallel
95. The Holding current of a thyristor is \_\_\_\_\_.  
(A) equal to its latching current.  
(B) more than its latching current.  
(C) less than its latching current.  
(D) either more or less; no relation exists between holding current and latching current.
96. A single-phase, phase-controlled rectifier has a freewheeling diode across the load. The freewheeling diode can be considered ideal. The instantaneous output voltage across the load \_\_\_\_\_.  
(A) is always positive (B) may be positive or zero  
(C) may be positive, negative or zero (D) may be negative or zero
97. D flip-flop is said to be transparent when \_\_\_\_\_.  
(A) the output is high  
(B) the output follows the clock  
(C) the output follows the input  
(D) the output is low

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98. What is the decimal equivalent of binary number 10101?  
(A) 12 (B) 19  
(C) 21 (D) 27
99. Which ADC (Analog to Digital Converter) is slowest?  
(A) Parallel comparator type  
(B) Successive approximation type  
(C) Integrating type  
(D) Counting type
100. A constant load is fed from a constant DC source via an SCR. After triggering the SCR, the gate pulse is removed. The current in the SCR will \_\_\_\_\_.  
(A) remain the same  
(B) immediately fall to zero  
(C) slightly reduce  
(D) initially increase and then fall to zero
101. In which of the following cases of speed control of induction motor drives, the V/f ratio is maintained constant?  
(A) Below base speed with voltage control  
(B) Below base speed with frequency control  
(C) Above base speed with frequency control  
(D) None of the above
102. Which of the following speed control techniques is not applicable in squirrel cage induction motor drives?  
(A) Stator voltage control (B) Supply frequency control  
(C) Pole changing (D) Slip power recovery
103. In a single-phase full bridge, single-pulse modulation of PWM inverters, the pulse width is  $120^\circ$ . What is RMS value of output AC voltage, if input DC voltage is 220 V?  
(A) 179.63 V (B) 254.04 V  
(C) 127.02 V (D) 185.04 V
104. Choose the correct statement regarding the power semiconductor device.  
(A) Both BJT and MOSFET are voltage controlled devices  
(B) MOSFET is voltage controlled device, BJT is current controlled device  
(C) MOSFET is current controlled device, BJT is voltage controlled device  
(D) Both BJT and MOSFET are current controlled devices

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105. The number of distinct Boolean expression of 4 variables is \_\_\_\_\_.
- (A) 16 (B) 256  
(C) 1024 (D) 65536
106. The complete set of only those Logic Gates designated as Universal Gates is \_\_\_\_\_.
- (A) NOT, OR and AND Gates  
(B) XNOR, NOR and NAND Gates  
(C) NOR and NAND Gates  
(D) XOR, NOR and NAND Gates
107. Which of the following circuits are classified as combinational logic circuits?  
1. Full adder 2. Full subtractor 3. Half adder 4. J-K flip-flop 5. Counter
- (A) 1 only (B) 3 and 4  
(C) 4 and 5 (D) 1, 2 and 3
108. What is the role of AC grid-tied inverter in solar PV generation system?
- (A) converts AC to DC and feeds the power from grid to solar panel  
(B) converts DC to AC and feeds the power from grid to solar panel  
(C) converts DC to AC and feeds the power from solar panel to grid  
(D) converts AC to DC and feeds the power from solar panel to grid
109. Which among the following is not attainable shunt VAR compensator?
- (A) Thyristor switched reactor  
(B) Thyristor controlled reactor  
(C) Thyristor switched capacitor  
(D) Thyristor controlled capacitor
110. In a sine PWM controlled inverter, the magnitude of output AC voltage is determined by \_\_\_\_\_.
- (A) switching frequency  
(B) frequency of reference signal  
(C) amplitude modulation index  
(D) load power factor
111. A power MOSFET having turn-on delay time, rise time, turn-off delay time, and fall time of 100 ns (nano seconds) each, cannot be operated at which of the following switching frequencies?
- (A) 3 kHz (B) 30 kHz  
(C) 300 kHz (D) 3000 kHz

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112. Freewheeling diode at the output of a rectifier allows \_\_\_\_\_.

- (A) SCR to trigger properly
- (B) turn-off SCR at the end of half cycle
- (C) protection of SCR against over voltage
- (D) None of the above

113. In the following K-map, the input variables are A, B and C. What is the simplified Boolean expression for output variable Y in terms of the input variables?

|   |   |    |    |    |    |
|---|---|----|----|----|----|
|   |   | BC |    |    |    |
|   |   | 00 | 01 | 11 | 10 |
| A | 0 | 0  | 0  | 1  | 0  |
|   | 1 | 0  | 1  | 1  | 1  |

- (A)  $Y = AB + BC + CA$
- (B)  $Y = ABC + BC$
- (C)  $Y = ABC + CA$
- (D)  $Y = BC + CA$

114. The flow of information on data bus and address bus is \_\_\_\_\_ respectively.

- (A) unidirectional and unidirectional
- (B) bidirectional and unidirectional
- (C) unidirectional and bidirectional
- (D) bidirectional and bidirectional

115. The size of Accumulator, Register B, PC, DPTR and PSW in 8051 microcontroller are \_\_\_\_\_ bits respectively.

- (A) 8, 8, 16, 16, 8
- (B) 8, 16, 16, 16, 8
- (C) 8, 8, 16, 16, 16
- (D) 8, 8, 16, 8, 8

116. The 8051 microcontroller has 128 bytes of internal RAM out of which \_\_\_\_\_ bytes of memory can be addressed at the bit level.

- (A) 4
- (B) 8
- (C) 16
- (D) 128

117. Which of the following flags of 8051 microcontroller cannot be set or cleared by the programmer at will?

- (A) General purpose flags
- (B) C and AC
- (C) P and OV
- (D) None of the above

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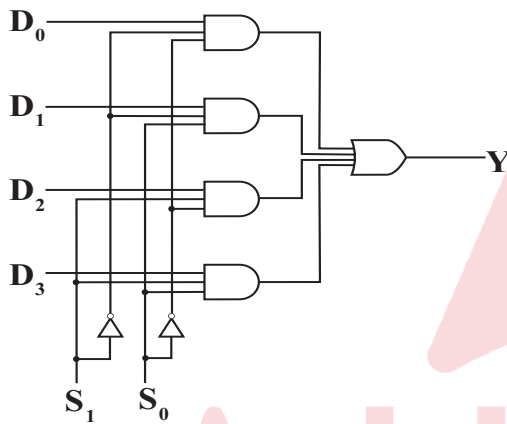
118. The SP is set to \_\_\_\_\_ when the 8051 microcontroller is reset.
- (A) 06h (B) 07h  
(C) 08h (D) 09h
119. Which pin of port 3 of 8051 microcontroller has an alternative function as write control signal for external data memory?
- (A) P3.4 (B) P3.5  
(C) P3.6 (D) P3.7
120. What is the function of EA pin in 8051 microcontroller?
- (A) enable/disable external memory interfacing  
(B) latch address and data bus  
(C) provide power supply  
(D) provide clock signal
121. Among the following interrupts of 8051 microcontroller, which one has higher priority?
- (A) Timer Flag Interrupt  
(B) External Interrupt  
(C) Reset  
(D) Serial Port Interrupt
122. What is the destination of serial interrupt in 8051 microcontroller?
- (A) 0003h  
(B) 0013h  
(C) 0023h  
(D) 0033h
123. What will be the contents of A after execution of the following set of instructions?
- MOV A, #0FFh  
MOV R0, #77h  
ANL A, R0
- (A) 00h (B) 77h  
(C) 88h (D) FFh
124. What will be the contents of A after execution of the following set of instructions?
- MOV A, #0A5h  
RR A  
RR A
- (A) A5h (B) D2h  
(C) 69h (D) B4h

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125. The capacity of a battery cell is measured in \_\_\_\_\_.
- (A) Watt-hour (B) Watt  
(C) Ampere (D) Ampere-hour

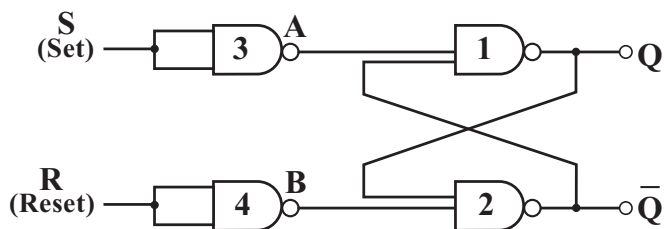
126. Trickle charging of a storage battery helps to \_\_\_\_\_.
- (A) prevent sulphation  
(B) maintain proper electrolyte level  
(C) keep it fully charged  
(D) increase its reserve capacity

127. The logic diagram of a 4-to-1 line multiplexer is shown below. What combination of select inputs  $S_1 - S_0$  will result in rejection of inputs  $D_0, D_1$  and  $D_3$ ?



- (A) 00  
(B) 01  
(C) 10  
(D) 11

128. What is the output of the SR-Latch shown below, if the inputs are changed from  $(S = 1; R = 0)$  to  $(S = 0; R = 0)$ ?



- (A)  $Q = 1; Q' = 0$  (B)  $Q = 0; Q' = 1$   
(C)  $Q = 0; Q' = 0$  (D) Output is undefined



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134. In a transmission line, both sending end and receiving end voltages are maintained at same magnitude and there is a real power flow from sending end to receiving end. The reactive power flow will be \_\_\_\_\_.
- (A) delivered by both buses into the line  
(B) absorbed by both buses from the line  
(C) delivered by sending end bus  
(D) no reactive power flow between buses
135. If we increase the height of transmission line above ground, what will be the effect on power transmission capability and charging current?
- (A) Both will decrease  
(B) Will increase and decrease  
(C) Power will remain same and charging current will decrease  
(D) Both will remain unaffected
136. Total Instantaneous power supplied by three phase AC supply to balanced RL load is \_\_\_\_.
- (A) Zero (B) Constant  
(C) Pulsating with zero average (D) Pulsating with non-zero average
137. If the phase conductor of a three phase line are not magnetically coupled, then the positive, negative and zero sequence of line follows as \_\_\_\_\_.
- (A)  $Z_1 = Z_2 < Z_0$  (B)  $Z_1 < Z_2 < Z_0$   
(C)  $Z_1 < Z_2 = Z_0$  (D)  $Z_1 = Z_2 = Z_0$
138. A balanced three phase power system consists of \_\_\_\_\_.
- (A) zero sequence current only  
(B) positive sequence current only  
(C) negative and zero sequence currents  
(D) positive, negative and zero sequence currents
139. The rated voltage of a three phase power system is given as \_\_\_\_\_.
- (A) RMS phase voltage (B) Peak Phase voltage  
(C) RMS line to line voltage (D) Peak line to line voltage
140. A Buchholz relay is used for \_\_\_\_\_.
- (A) protection of transformer against all internal faults  
(B) protection of transformer against all external faults  
(C) protection of transformer against both internal and external faults  
(D) protection of induction motors

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141. A lossless transmission line has a characteristic impedance of  $Z_0$  and capacitance per unit length of  $C$ . The velocity propagation of the travelling wave on the line is \_\_\_\_\_.
- (A)  $C / Z_0$  (B)  $Z_0 / C$   
(C)  $1 / Z_0 C$  (D)  $Z_0 C$
142. The transmission line distance protection relay having the property of being inherently directional is \_\_\_\_\_.
- (A) Impedance relay (B) MHO relay  
(C) OHM relay (D) Reactance relay
143. Resistance switching is normally employed in \_\_\_\_\_.
- (A) All breakers (B) Bulk oil breakers  
(C) Minimum oil breakers (D) Air blast circuit breakers
144. The symmetrical components are used in the fault analysis because \_\_\_\_\_.
- (A) the sequence of networks does not have mutual couplings  
(B) the number of equations become smaller  
(C) the results are required in terms of symmetrical components  
(D) none of above
145. In a biased differential relay, the bias is defined as a ratio of \_\_\_\_\_.
- (A) operating coil current and restraining coil current.  
(B) number of turns of restraining and operating coils.  
(C) fault current and operating coil current.  
(D) fault current and restraining coil current.
146. A power station has a maximum demand of 15,000 kW. The annual load factor is 50% and plant capacity factor is 40%. The reserve capacity of the plant is \_\_\_\_\_.
- (A) 5000 MW (B) 1241 kW  
(C) 4800 MW (D) 3750 kW
147. In load flow analysis, the load connected at a bus is represented as \_\_\_\_\_.
- (A) Constant current drawn from the bus  
(B) Constant impedance connected at the bus  
(C) Voltage and frequency dependent source at the bus  
(D) Constant real and reactive power drawn from the bus

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148. In case of transmission line, AC resistance is more than DC resistance due to \_\_\_\_\_.
- (A) Ferranti effect (B) Skin effect  
(C) Proximity effect (D) Both (B) & (C)
149. A transmission line has a conductor radius  $r = 1$  cm, produces an internal inductance  $L_{int} = 0.05$  mH/km. If the size of the conductor is doubled, then its  $L_{int}$  is \_\_\_\_\_.
- (A) 0.1 mH/km (B) 0.05 mH/km  
(C) 0.025 mH/km (D) 0
150. Steady state stability of a power system is the ability of the power system to \_\_\_\_\_.
- (A) Maintain voltage at the rated voltage level  
(B) Maintain frequency exactly at 50 Hz  
(C) Maintain a spinning reserve margin at all times  
(D) Maintain synchronism between machines and external tie lines
151. The primary purpose of transferring the power at higher voltage is \_\_\_\_\_.
- (A) to reduce transmission loss  
(B) to increase the area of cross-section of conductor  
(C) to decrease number of insulators in a string  
(D) none of these
152. The insulation level of a 400 kV, EHV overhead transmission line is decided on the basis of \_\_\_\_\_.
- (A) Switching overvoltage (B) Lightning overvoltage  
(C) Radio and TV interference (D) Corona inception voltage
153. The impedance value of a generator is 0.2 pu on a base value of 11 kV, 50 MVA. The impedance value for a base value of 22 kV, 150 MVA is
- (A) 0.15 pu (B) 0.2 pu  
(C) 0.3 pu (D) 0.4 pu
154. For a fault at synchronous generator terminal, the fault current is maximum for a \_\_\_\_\_.
- (A) Line-to-Line fault (B) Line-to-Ground fault  
(C) Three Phase-to-Ground fault (D) Three Phase fault

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155. In swing equation of a synchronous generator, the angle  $\delta$  represents \_\_\_\_\_.
- (A) angular displacement of the stator mmf with respect to a synchronously rotating axis.  
(B) angular displacement of an axis fixed to the rotor with respect to a synchronously rotating axis.  
(C) angular displacement of the rotor with respect to the stator.  
(D) angle between stator voltage and current
156. For which type of fault protection, reactance relay is normally preferred \_\_\_\_\_.
- (A) Earth faults (B) Phase faults  
(C) Open-circuit faults (D) None of these
157. A negative sequence relay is commonly used to protect \_\_\_\_\_.
- (A) a transmission line (B) a bus bar  
(C) a transformer (D) an alternator
158. The interrupting time of a circuit breaker is the period between the instant of \_\_\_\_\_.
- (A) energizing of the trip circuit and the parting of primary arc contacts.  
(B) energizing of the trip circuit and the arc extinction on an opening operation.  
(C) initiation of short circuit and the arc extinction on an opening operation.  
(D) initiation of short circuit and the parting of primary arc contacts
159. The chances of arc interruption in subsequent current zero \_\_\_\_\_.
- (A) increases in case of Oil Circuit Breaker  
(B) decreases in case of Oil Circuit Breaker  
(C) interruption is always at first current zero (in Oil Circuit Breaker)  
(D) none of the above
160. In the protection of transformers, harmonic restraint is used to guard against \_\_\_\_\_.
- (A) magnetizing inrush current (B) unbalanced operation  
(C) lightning (D) switching overvoltage
161. The non-uniform distribution of voltage across the units in a string of suspension type insulators is due to \_\_\_\_\_.
- (A) unequal self-capacitance of the units  
(B) non-uniform distance of separation of the units from the tower body  
(C) the existence of stray capacitance between the metallic junctions of the units and the tower body  
(D) non-uniform distance between the cross-arm and the units

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162. For transmission line operating at 400 kV, which of the following insulator is used?  
(A) Pin type  
(B) Suspension type  
(C) The combination of (A) & (B) above  
(D) None of the above
163. 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
164. A power system is subjected to a fault which makes the zero sequence component of current equal to zero. The nature of the fault is \_\_\_\_\_.  
(A) Double line to Ground fault  
(B) Double line fault  
(C) Line to Ground fault  
(D) Three-phase to Ground fault
165. The reflection coefficient of a short-circuited line is \_\_\_\_\_.  
(A) -1 (B) +1  
(C) 0.5 (D) 0
166. The charging current in a transmission line increases due to corona effect because corona increases the \_\_\_\_\_.  
(A) line current (B) effective line voltage  
(C) effective conductor diameter (D) all of the above are correct
167. A power system network with a capacity of 100 MVA has a source impedance of 10% MVA at a point. The fault level at that point is \_\_\_\_\_.  
(A) 10 MVA (B) 30 MVA  
(C) 3000 MVA (D) 1000 MVA
168. If the reference bus is changed in two load flow runs with same system data and power obtained for reference bus taken as specified P and Q in the latter run \_\_\_\_\_.  
(A) The system losses will change but the complex bus voltages will remain unchanged.  
(B) The system losses will be unchanged but the complex bus voltages will change.  
(C) The system losses as well as the complex bus voltages will change.  
(D) The system losses as well as the complex bus voltages will be unchanged.

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169. In a 80 bus power system, there are 10 generators. In a particular iteration of Newton-Raphson load flow technique (in polar coordinates), two of the PV buses are converted to PQ type. In this iteration \_\_\_\_\_.
- (A) The number of unknown voltage angles increases by two and the number of unknown voltage magnitudes increases by two.
  - (B) The number of unknown voltage angles remains unchanged and the number of unknown voltage magnitudes increases by two.
  - (C) The number of unknown voltage angles increases by two and the number of unknown voltage magnitudes decreases by two.
  - (D) The number of unknown voltage angles remains unchanged and the number of unknown voltage magnitudes decreases by two.
170. In Thyristor based HVDC link \_\_\_\_\_.
- (A) Rectifier station consumes reactive power and Inverter station supplies reactive power
  - (B) Both Rectifier and Inverter station supply reactive power
  - (C) Both Rectifier and Inverter station consume reactive power
  - (D) Rectifier station supplies reactive power and Inverter station consumes reactive power
171. HVDC transmission is preferred to EHV-AC because \_\_\_\_\_.
- (A) HVDC terminals are inexpensive.
  - (B) VAR compensation is not required in HVDC system.
  - (C) system stability can be improved.
  - (D) harmonics problem is avoided.
172. Power carrying capability (P) of HVDC transmission line with distance (d) varies as \_\_\_\_\_.
- (A)  $P \propto d$
  - (B)  $P \propto \frac{1}{d^2}$
  - (C)  $P \propto \frac{1}{d}$
  - (D) Independent of d
173. HVDC transmission is essential in the following case of interconnection of system with \_\_\_\_\_.
- (A) Different frequencies
  - (B) Short distance transmission
  - (C) Medium distance transmission
  - (D) Long distance transmission
174. In HVDC transmission system, rectifier firing angle is kept near \_\_\_\_\_.
- (A)  $0^\circ$
  - (B)  $15^\circ$
  - (C)  $30^\circ$
  - (D)  $90^\circ$

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175. Large number of thyristors are connected in series in HVDC converter station due to \_\_\_\_\_.
- (A) Voltage ratings of thyristors are low  
(B) Current ratings of thyristors are low  
(C) Thyristor always fails in an internal open circuit  
(D) Voltage ratings of thyristors are high
176. The load-frequency characteristic of a generation unit is a \_\_\_\_\_.
- (A) straight line having positive slope  
(B) straight line having negative slope  
(C) straight line with zero slope  
(D) parabola with positive slope
177. The main purpose of energy conservation is to \_\_\_\_\_.
- (A) increase energy production  
(B) reduce energy consumption  
(C) maintain constant energy use  
(D) increase power generation
178. Which of the following is an example of energy-efficient lighting?
- (A) Incandescent bulb                      (B) Fluorescent lamp  
(C) LED lamp                                  (D) Halogen lamp
179. In order to have a lower cost of electrical energy generation, \_\_\_\_\_.
- (A) the load factor and diversity factor should be low  
(B) the load factor should be low but diversity factor should be high  
(C) the load factor should be high but diversity factor should be low  
(D) the load factor and diversity factor should be high
180. What device can be used to reduce energy consumption in electric motors?
- (A) Variable Speed Drive (VSD)                      (B) Transformer  
(C) Capacitor    (D) Fuse
181. Which international organization publishes the World Energy Outlook?
- (A) World Bank    (B) United Nations  
(C) OPEC    (D) International Energy Agency (IEA)
182. What is the target year set by many countries to achieve net-zero carbon emissions as per the Paris Agreement?
- (A) 2030    (B) 2040  
(C) 2050    (D) 2060

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183. What is the main purpose of energy banking in a grid system?
- (A) To sell surplus energy at a premium
  - (B) To reduce grid stability
  - (C) To allow producers to store excess energy generated during low demand and retrieve it when needed
  - (D) To generate additional profits for consumers
184. Which of the following is the largest source of renewable energy in the world?
- (A) Wind energy
  - (B) Hydropower
  - (C) Geothermal energy
  - (D) Biomass energy
185. What is the role of the Bureau of Energy Efficiency in India?
- (A) To develop policies for energy conservation
  - (B) To manage the transmission of energy
  - (C) To provide financial aid for power generation
  - (D) To monitor energy consumption
186. The star rating label on electrical appliances in India is issued by \_\_\_\_\_.
- (A) Ministry of New and Renewable Energy (MNRE)
  - (B) Bureau of Energy Efficiency (BEE)
  - (C) Central Electricity Regulatory Commission (CERC)
  - (D) State Electricity Boards (SEBs)
187. In three phase system, the phasor sum of current is zero. Then there will be no \_\_\_\_\_.
- (A) Positive sequence component
  - (B) Negative sequence component
  - (C) Zero sequence component
  - (D) None of the above
188. Which material is used in controlling chain reaction in a nuclear power plant?
- (A) Thorium
  - (B) Heavy Water
  - (C) Boron
  - (D) Beryllium
189. For harnessing low variable water heads, the suitable hydraulic turbine with high percentage of reaction and runner adjustable vanes is \_\_\_\_\_.
- (A) Kaplan
  - (B) Francis
  - (C) Pelton
  - (D) Impeller

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190. In a Line Commutated Converter based HVDC, the reversal of power can be done by \_\_\_\_\_.
- (A) Reversing the polarity of DC Voltage
  - (B) Reversing the DC current direction
  - (C) Both (A) and (B)
  - (D) It is not possible to reverse power in Line Commutated Converter based HVDC
191. Which types of waste are covered under the Gujarat Waste to Energy Policy 2022?
- (A) Only industrial waste
  - (B) Only agricultural waste
  - (C) Municipal solid waste (MSW), agricultural and industrial waste
  - (D) Only medical waste
192. Under the Electricity Act, 2003, the Central Electricity Authority (CEA) is primarily responsible for \_\_\_\_\_.
- (A) Technical standards and safety regulations
  - (B) Tariff determination
  - (C) Regulation of the electricity market
  - (D) Issuing licences to consumers
193. What is the role of State Electricity Regulatory Commissions (SERCs) under the Electricity Act, 2003?
- (A) To generate electricity
  - (B) To approve tariffs and ensure fair competition
  - (C) To manage the national grid
  - (D) To enforce coal regulations
194. In a bipolar Line Commutated Converter Based HVDC system \_\_\_\_\_.
- (A) both conductors are at positive potential with respect to ground
  - (B) both conductors are at negative potential with respect to ground
  - (C) one conductor at positive potential and the other at negative potential with respect to ground
  - (D) one conductor is at positive or negative potential with respect to ground and the other conductor is at ground potential
195. The chances of commutation failure in Line Commutated HVDC systems are more at \_\_\_\_\_.
- (A) Rectifier station
  - (B) Inverter station
  - (C) Equal chances at both rectifier and inverter stations
  - (D) There are no possibilities of commutation failure

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196. Which of the following is NOT a provision of the Gujarat Electricity Industry (Reorganization & Regulation) Act, 2003?
- (A) Open access to transmission networks
  - (B) Establishment of a State Electricity Board
  - (C) Tariff determination by the regulatory commission
  - (D) Promotion of renewable energy sources
197. Which of the following is a key function of the Electricity Regulatory Commission (ERC)?
- (A) Building power plants
  - (B) Setting tariffs for generation, transmission and distribution
  - (C) Selling electricity to consumers
  - (D) Maintaining power distribution networks
198. The term "Multi-Year Tariff" (MYT) refers to \_\_\_\_\_.
- (A) A tariff that changes annually
  - (B) A tariff that applies to multiple sectors
  - (C) A framework where tariffs are set for multiple years to avoid frequent changes
  - (D) A fixed tariff for a year only
199. Which of the following describes a "tariff petition"?
- (A) A request by a consumer to lower their electricity bill
  - (B) A legal document to start electricity distribution in a new area
  - (C) A government order mandating new tariffs
  - (D) A proposal by an electricity company to adjust tariffs
200. What is the maximum capacity (in MW) of a hydropower project classified as "Small Hydel" under the Gujarat Small Hydel Policy-2016?
- (A) 25 MW
  - (B) 50 MW
  - (C) 100 MW
  - (D) 150 MW

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