Electrical Sample Questions

Questions And Answers

No.	Question
1	The RMS value of the voltage u(t) =3 + 4cos (3t) is
Options	**A)** $\sqrt{(17)}$ V **B)** 5 V **C)** 7 V **D)** (3 + $\sqrt{2}$) V
Correct Answer	A
2	The open loop transfer function of a unity feed back control system is given as G(s) = $\frac{as + 1}{s^2}$ The value of 'a' to give a phase margin of 45° is equal to
Options	**A)** 0.141 **B)** 0.441 **C)** 0.841 **D)** 1.141
Correct Answer	C

3	The armature resistance of a permanent magnet dc motor is 0.8 W. At no load, the motor draws 1.5 A from a supply voltage of 25 V and runs at 1500 rpm. The efficiency of the motor while it is operating on load at 1500 rpm drawing a current of 3.5 A from the same source will be
Options	**A)** 48.0% **B)** 57.1%

C) 59.2% **D)** 88.8%

Correct Answer: A

4 The solution of the first order differential equation $x(t) = -3x(t)$, $x(0) = x_0$ is

Options:
A) $x(t) = x_0 e^{-3t}$ **B)** $x(t) = x_0 e^{-3}$
C) $x(t) = x_0 e^{-1/3}$ **D)** $x(t) = x_0 e^{-1}$

Correct Answer: A

5 The unit impulse response of a second order under-damped system starting from rest is given by
$c(t) = 12.5 e^{-6t} \sin 8t, \quad t \geq 0$
The steady-state value of the unit step response of the system is equal to

Options:
A) 0 **B)** 0.25
C) 0.5 **D)** 1.0

Correct Answer: D

6 A single-phase, 230 V, 50 Hz, 4 pole, capacitor-start induction motor has the following stand-still impedances
Main winding $Z_m = 6.0 + j4.0\ \Omega$
Auxiliary winding $Z_a = 8.0 + j6.0\ \Omega$
The value of the starting capacitor required to produce 90° phase difference between the currents in the main and auxiliary windings will be

Options:
A) 176.84 μF **B)** 187.24 μF
C) 265.26 μF **D)** 280.86 μF

Correct Answer: A

7 A single-phase half-controlled rectifier is driving a separately excited dc

	motor. The dc motor has a back emf constant of 0.5 V/rpm. The armature current is 5 A without any ripple. The armature resistance is 2Ω. The converter is working from a 280 V, single phase ac source with a firing angle of 80°. Under this operating condition, the speed of the motor will be
Options	**A)** 339 rpm **B)** 359 rpm **C)** 366 rpm **D)** 386 rpm
Correct Answer	C
8	The 8085 assembly language instruction that stores the content of H and L registers into the memory locations 2050_H and 2051_H, respectively, is
Options	**A)** SPHL 2050_H **B)** SPHL2051_H **C)** SHLD 2050_H **D)** STAX 2050_H
Correct Answer	C
9	A 50 Hz, 4-pole, 500 MVA, 22 kV turbo-generator is delivering rated megavolt-amperes at 0.8 power factor. Suddenly a fault occurs reducing is electric power output by 40%. Neglect losses and assume constant power input to the shaft. The accelerating torque in the generator in MNm at the time of the fault will be
Options	**A)** 1.528 **B)** 1.018 **C)** 0.848 **D)** 0.509
Correct Answer	A
10	The Nyquist plot of loop transfer function G(s) H(s) of a closed loop control system passes through the point (-1, j0) in the G(s) H(s) plane. The phase margin of the system is
Options	**A)** 0° **B)** 45° **C)** 90° **D)** 180°
Correct Answer	D

11	A 50 kW dc shunt motor is loaded to draw rated armature current at any given speed. When driven (i) at half the rated speed by armature voltage control and (ii) at 1.5 times the rated speed by field control, the respective output powers delivered by the motor are approximately.
Options	**A)** 25kW in (i) and 75kW in (ii) **B)** 25kW in (i) and 50kW in (ii) **C)** 50kW in (i) and 75kW in (ii) **D)** 50kW in (i) and 50kW in (ii)
Correct Answer	B

12	A hydraulic turbine having rated speed of 250 rpm is connected to a synchronous generator. In order to produce power at 50 Hz, the number of poles required in the generator are
Options	**A)** 6 **B)** 12 **C)** 16 **D)** 24
Correct Answer	D

13	For the equation $x(t)+3\,x(t)+2x(t) = 5$, the solution x (t) approaches which of the following values as $t \rightarrow \infty$?
Options	**A)** 0 **B)** $\frac{5}{2}$ **C)** 5 **D)** 10
Correct Answer	B

14	The following motor definitely has a permanent magnet rotor
Options	**A)** DC commutator motor **B)** Brushless dc motor **C)** Stepper motor **D)** Reluctance motor
Correct	C

Answer

15 A110 kV, single core coaxial, XLPE insulated power cable delivering power at 50Hz, has a capacitance of 125 nF/km. If the dielectric loss tangent of XLPE is 2×10^{-4}, the dielectric power loss in this cable in W/km is

Options
A) 5.0 **B)** 31.7
C) 37.8 **D)** 189.0

Correct Answer D

16 The simultaneous application of signals x(t) and y(t) to the horizontal and vertical plates, respectively, of an oscilloscope, produces a vertical figure-of-8 display. If P and Q are constants, and x(t) = P sin (4t + 30), then y(t) is equal to

Options
A) Q sin (4t - 30) **B)** Q sin (2t + 15)
C) Q sin (8t + 60) **D)** Q sin (4t + 30)

Correct Answer B

17 A 500 MW 3-phase Y-connected synchronous generator has a rated voltage of 21.5 kV at 0.85pf. The line current when operating at full load rated conditions will be

Options
A) 13.43 kA **B)** 15.79 kA
C) 23.25 kA **D)** 27.36 kA

Correct Answer B

18 Total instantaneous power supplied by a 3-phase ac supply to a balanced R-L load is

Options
A) zero **B)** constant
C) pulsating with zero average **D)** pulsating with non-zero average

Correct Answer B

19	The equivalent circuit of a transformer has leakage reactances X_1 , X
Options	**A)** $X_1 >> X$ **B)** $X_1 << X$ **C)** $X_1 \approx X$ **D)** $X_1 \approx X$
Correct Answer	D

20	If P and Q are two random events, then the following is TRUE
Options	**A)** Independence of P and Q implies that probability (P $\cap$ Q) = 0 **B)** Probability (P $\cup$ Q) $\geq$ Probability (P) + Probability (Q) **C)** If P and Q are mutually exclusive, then they must be independent **D)** Probability (P $\cap$ Q) $\leq$ Probability (P)
Correct Answer	D