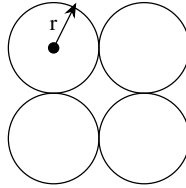
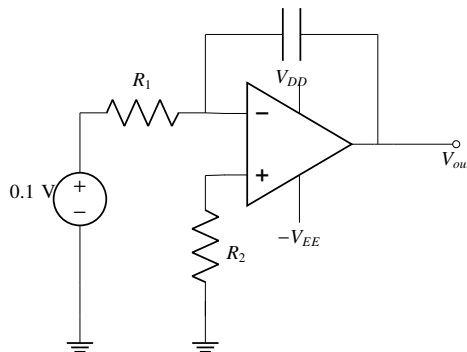


- 14) The geometric mean radius of a conductor having four equal strands with each strand r , as shown in the figure below, is

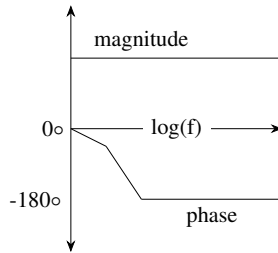


- a) $4r$
 b) $1.414r$
 c) $2r$
 d) $1.723r$
- 15) The valid positive, negative and zero sequence in $(in p \cdot u)$, respectively for a $220kV$ fully transposed three-phase transmission line, from the given choices are
- a) 1.1, 0.15 and 0.08
 b) 0.15, 0.15 and 0.35
 c) 0.2, 0.2 and 0.2
 d) 0.1, 0.3 and 0.1
- 16) The steady state output (V_{out}) of the circuit shown below, will

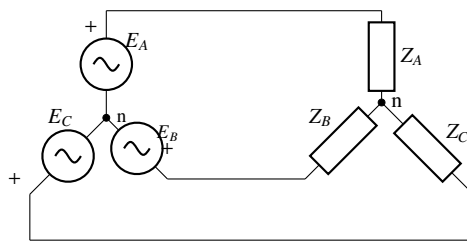


- a) saturate to $+V_{DD}$
 b) saturate to $-V_{EE}$
 c) becomes equal to $0.1V$
 d) becomes equal to $-0.1V$

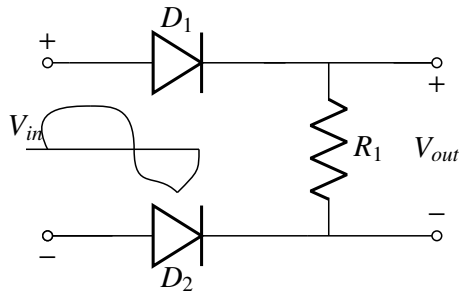
- 17) The Bode magnitude plot of a first order stable system is constant with frequency. The asymptotic value of high frequency phase, for the system is -180° . This system has



- a) one LHP pole one RHP zero at the same frequency
 - b) one LHP pole one LHP zero at the same frequency
 - c) two LHP poles and one RHP zero.
 - d) two RHP poles and one LHP zero
- 18) A balanced wheatstone bridge has the following arm resistance:
 $R_{AB} = 1K\Omega \pm 2.1$ percent; $R_{BC} = 100\Omega \pm 0.5$ percent; R_{CD} is a unknown resistance;
 $R_{DA} = 300\Omega \pm 0.4$ percent. The value of R_{CD} and its accuracy is
- a) $30\Omega \pm 3\Omega$
 - b) $30\Omega \pm 0.9\Omega$
 - c) $3000\Omega \pm 90\Omega$
 - d) $3000\Omega \pm 3\Omega$
- 19) The open loop transfer function of a unity gain negative feedback system is given by $G(s) = \frac{k}{s^2 + 4s - 5}$. The of K for which the system is stable, is
- a) $k > 3$
 - b) $k < 3$
 - c) $k > 5$
 - d) $k < 5$
- 20) Consider a 3×3 matrix whose (i, j) -th element $a_{i,j} = (i - j)^2$. Then the matrix A will be
- a) symmetric
 - b) skew-symmetric
 - c) unitary
 - d) null.
- 21) In the circuit shown below, a three phase star-connected unbalanced load is connected to a balanced three-phase supply of $100\sqrt{3}V$ with phase sequence ABC . the star the voltage difference across the nodes n and n' is zero is
- a) $20^\circ - 30^\circ$



- b) $20 < 30^\circ$
 c) $20 < -60^\circ$
 d) $20 < 600^\circ$
- 22) A charger supplies $100W$ at $20V$ for charging of battery of a laptop. The power devices, used in the converter inside the charger operate at a switching at a frequency of $200kHz$ which power devices is best suited for this purpose?
- a) IGBT
 b) Thyristor
 c) MOSFET
 d) BJT
- 23) A long conducting cylinder having a radius b is placed along Z axis. The current density is $J = J_a r^3 \hat{z}$ for the region $r < b$ where r is the distance in the radial direction. The magnitude of the magnetic field intensity (H) for the region inside of the conductor (i.e. for $r < b$) is
- a) $\frac{j_a}{4} r^4$
 b) $\frac{j_a}{3} r^3$
 c) $\frac{j_a}{5} r^5$
 d) $j_a r^3$
- 24) The type of single phase induction motor, expected to have the maximum power factor during steady state running condition is
- a) split phase (*resistance start*)
 b) shaded pole
 c) capacitor start
 d) capacitor start, capacitor run.
- 25) For the circuit shown below with ideal diodes, the output will be
- a) $V_{out} = V_{in}$ for $V_{in} > 0$
 b) $V_{out} = V_{in}$ for $V_{in} < 0$
 c) $V_{out} = -V_{in}$ for $V_{in} > 0$



d) $V_{out} = -V_{in}$ for $V_{in} < 0$

26) A MOD 2 and a MOD 5 up-counter when cascaded together results in a MOD counter _____