ACE Engineering Academy

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ESE- 2019 (Prelims) - Offline Test Series Test-15

ELECTRONICS & TELECOMMUNICATION ENGINEERING

SUBJECT: SIGNALS & SYSTEMS, BASIC ELECTRICAL ENGINEERING, ADVANCED COMMUNICATION AND ADVANCED ELECTRONICS

SOLUTIONS

01 Ans: (d)

Sol: Given x(t) = u(t – 2) & h(t) = u(t – 1)

We know that $u(t) * u(t) = r(t)$

$u(t-t_1) * u(t-t_2) = r(t-t_1-t_2)$, $u(t-1) * u(t-2) = r(t-1-2)$

$= r(t-3)$

$= (t-3)u(t-3)$

02. Ans: (b)

Sol: Given x(t) = m(t) y(t) - - - - - - - (1)

and $Y(\omega) = 2X(\omega-\omega_c)$ - - - - - - (2)

Apply IFT to equation (2)

$y(t) = 2x(t)e^{j\omega_c t}$

$x(t) = \frac{1}{2}y(t)e^{-j\omega_c t}$ - - - - - - - (3)

Comparing (1) & (3), then $m(t) = \frac{1}{2}e^{-j\omega_c t}$

03. Ans: (d)

Sol: In parametric equalizers we can adjust gain, cut-off frequency, B.W

04. Ans: (b)

Sol: Given $\frac{dw(t)}{dt} = y(t) + x(t)$ - - - - - - - - (1)

$\frac{dy(t)}{dt} = -w(t)$ - - - - - - - - (2)

Apply Laplace transform to equation (1)

sW(s) = Y(s) + X(s) - - - - - - - (3)

Apply Laplace transform to equation (2)

sY(s) = –W(s) - - - - - - - (4)

From (3) & (4)

$s[-sY(s)] = Y(s) + X(s)$

$-s^2Y(s) - Y(s) = X(s)$

$$H(s) = \frac{Y(s)}{X(s)} = -\frac{1}{s^2+1}$$

Apply Inverse Laplace Transform

$h(t) = -\sin(t)u(t)$

05. Ans: (c)

Sol:

(1) $y(n) - 0.4y(n-1) = x(n)$

Apply z-transform

$Y(z) - 0.4\,z^{-1}Y(z) = X(z)$

$$H(z) = \frac{Y(z)}{X(z)} = \frac{1}{1-0.4z^{-1}}$$

Pole = 0.4, lies inside the unit circle. So, it is stable. Statement (1) is false.

(2) All poles of FIR filter lies inside the unit circle. So, FIR filters are always stable. Statement (2) is true.

(3) $\sum_{n=-\infty}^{\infty}|h(n)| = \sum_{n=0}^{\infty}2(0.4)^n = \frac{2}{1-0.4} < \infty$, So, it is stable.

Statement (3) is false.

06. Ans: (b)

Sol: Given $x(n) = 2\delta(n+2) + 2\delta(n-2)$

$X(e^{j\omega}) = 2e^{2j\omega} + 2e^{-2j\omega}$

and $H(e^{j\omega}) = 4 - 2e^{-2j\omega}$

$Y(e^{j\omega}) = X(e^{j\omega})\,H(e^{j\omega})$

$= 8e^{2j\omega} - 4 + 8e^{-2j\omega} - 4e^{-4j\omega}$

Apply IDTFT

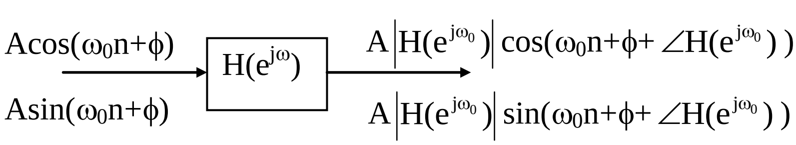
$y(n) = 8\delta(n+2) - 4\delta(n) + 8\delta(n-2) - 4\delta(n-4)$

$y(n) = \{8, 0, \underset{\uparrow}{-4}\ 0, 8, 0, -4\}$

$y(-1) = 0$

07. Ans: (b)

Sol:



Given

$$x(n) = 4\sin\left(\frac{\pi}{3}n + \frac{\pi}{4}\right) - \cos\left(\frac{3\pi}{4}n + \frac{\pi}{6}\right)$$

Consider $x_1(n) = 4\sin\left(\frac{\pi}{3}n + \frac{\pi}{4}\right)$

$\omega_0 = \frac{\pi}{3}$ lies in the range of $-\frac{\pi}{2} \le \omega \le \frac{\pi}{2}$

So, $y_1(n) = 4k\sin\left(\frac{\pi}{3}n + \frac{\pi}{4} + \frac{3\pi}{3}\right)$

$$y_1(n) = 4k\sin\left(\frac{\pi}{3}(n+3) + \frac{\pi}{4}\right)$$

$$x_2(n) = \cos\left(\frac{3\pi}{4}n + \frac{\pi}{6}\right)$$

$\omega_0 = \frac{3\pi}{4}$ is not in the range of $-\frac{\pi}{2}$ to $\frac{\pi}{2}$. So, $y_2(n) = 0$

$y(n) = y_1(n) + y_2(n)$

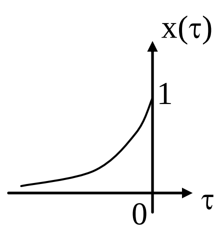
$$y(n) = 4k\sin\left(\frac{\pi}{3}(n+3) + \frac{\pi}{4}\right)$$

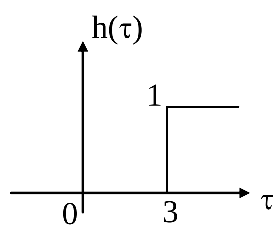
08. Ans: (b)

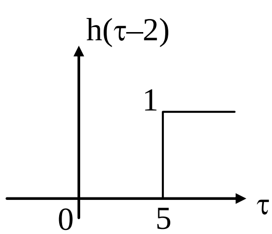
Sol: $y(t) = x(t)*h(t)$

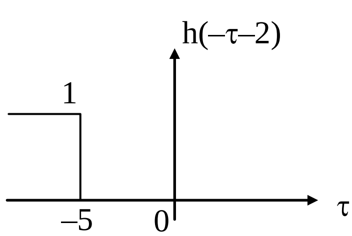
$$y(t) = \int_{-\infty}^{\infty} x(\tau)h(t-\tau)d\tau$$

$$y(-2) = \int_{-\infty}^{\infty} x(\tau)h(-2-\tau)d\tau$$









$$y(-2) = \int_{-\infty}^{-5} e^{2\tau}.1.1d\tau$$

$$y(-2) = \frac{e^{2\tau}}{2}\Bigg|_{-\infty}^{-5} = \frac{1}{2}\left[e^{-10} - 0\right] = \frac{e^{-10}}{2}$$

09. Ans: (a)

Sol: Assume $y(t) = \frac{dx(t)}{dt}$

From differentiation in time domain property

$$\frac{dx(t)}{dt} \leftrightarrow jk\omega_0 a_k$$

Assume y(t) coefficients is 'b_k' then

$b_k = 0$ $\quad\quad$ $k = 0$

$= -k\left(\frac{1}{2}\right)^{|k|}\omega_0$ $\quad$ otherwise

so, $b_0 = 0$

10. Ans: (d)

Sol: $x_1(t) \leftrightarrow X_1(s)$, ROC R_1

$x_2(t) \leftrightarrow X_2(s)$, ROC R_2

$x_1(t) * x_2(t) \leftrightarrow X_1(s)X_2(s)$, ROC $R_1 \cap R_2$

11. Ans: (a)

Sol: Rectangular window main lobe width is $\frac{4\pi}{N}$

Hanning window main lobe width is $\frac{8\pi}{N}$

Hamming window main lobe width is $\frac{8\pi}{N}$

Blackmann window main lobe width is $\frac{12\pi}{N}$

12. Ans: (b)

Sol: $y(n) = x(n) + 2nx(n-1)$

$y_1(n) = x_1(n) + 2nx_1(n-1)$

$y_2(n) = x_2(n) + 2nx_2(n-1)$

$y_3(n) = [\alpha x_1(n) + \beta x_2(n)] + 2n[\alpha x_1(n-1) + \beta x_2(n-1)]$

$y_3(n) = \alpha y_1(n) + \beta y_2(n)$

So, linear system

$y_1(n) = x(n-k) + 2nx(n-k-1)$

$y(n-k) = x(n-k) + 2(n-k)x(n-k-1)$
$y_1(n) \neq y(n-k)$
So time variant.

13. Ans: (c)
Sol: The peak side lobe in the case of Hanning window has a value of – 32dB.

14. Ans: (b)
Sol: $$\frac{z^2 Y(z)}{z^2} = \frac{1}{1+2z^{-1}}$$

$$Y(z) = \frac{1}{1+2z^{-1}}$$

$$(-2)^n u(n) \leftrightarrow \frac{1}{1+2z^{-1}}$$

So, $y(n) = (-2)^n u(n)$

15. Ans: (c)
Sol: If $x(n) = z^n \Rightarrow y(n) = z^n H(z)$
$x(n) = (-1)^n \Rightarrow y(n) = (-1)^n \left. H(z)\right|_{z=-1}$

$$H(z) = \frac{1}{1-\frac{1}{2}z^{-1}} = \frac{Y(z)}{X(z)}$$

$$\left. H(z)\right|_{Z=-1} = \frac{1}{\frac{3}{2}} = \frac{2}{3}$$

So, $y(n) = \frac{2}{3}(-1)^n$

16. Ans: (b)
Sol: $$X(k) = \sum_{n=0}^{7} x(n) e^{-j\frac{2\pi}{8}nk}$$

$$X(0) = \sum_{n=0}^{7} x(n) = x(0) + x(1) + x(2) + x(3) + x(4) + x(5) + x(6) + x(7)$$

$$X(4) = \sum_{n=0}^{7} x(n)(-1)^n = x(0) - x(1) + x(2) - x(3) + x(4) - x(5) + x(6) - x(7)$$

$X(0) + X(4) = 2x(0) + 2x(2) + 2x(4) + 2x(6)$

$$2\sum_{n=0}^{3} x(2n) = X(0) + X(4)$$

$$\sum_{n=0}^{3} x(2n) = \frac{16+0}{2} = 8$$

17. Ans: (c)

Sol: $\text{Sgn}(t) \leftrightarrow \frac{1}{j\pi f}$

From Time reversal property

$$\text{Sgn}(-t) \leftrightarrow \frac{-1}{j\pi f}$$

$$-3\text{Sgn}(t) \leftrightarrow \frac{-3}{j\pi f}$$

So, x(t) = – 3Sgn(t)

$x(t) = -3\text{Sgn}(t) = -3 \quad t > 0$

$\qquad\qquad\qquad = 3 \quad t < 0$

18. Ans: (a)

Sol: $X_2(\omega) = 2X_1(\omega) \quad \omega > 0$

$\qquad = 0 \quad \omega < 0$

$$E_{X_2(\omega)} = \frac{1}{2\pi}\int_0^\infty |2X_1(\omega)|^2 d\omega$$

$$= 4\left[\frac{1}{2\pi}\int_0^\infty |X_1(\omega)|^2 d\omega\right]$$

$$= 4 \times \frac{E_1}{2}$$

$$= 2E_1$$

19. Ans: (b)

Sol: $X(s) = \int_{-\infty}^{\infty} x(t)e^{-st}dt$

Convergence condition is

$$= \int_{-\infty}^{\infty} \left|x(t)e^{-\sigma t}\right| dt < \infty$$

20. Ans: (b)

Sol: The necessary and sufficient condition for a period signal x(t) can expanded by Fourier series is

$$\int_0^T |x(t)|\, dt < \infty$$

21. Ans: (b)

Sol: $e^{-t}u(t) \leftrightarrow \frac{1}{s+1}$

$e^{-(t-1)}u(t-1) \leftrightarrow \frac{e^{-s}}{s+1}$

$e^{-(t+1)}u(t) \leftrightarrow \frac{e^{-1}}{s+1}$

$e^{-t}u(t-1) \leftrightarrow \frac{e^{-(s+1)}}{s+1}$

22. Ans: (a)

Sol: Phase delay $t_p(\omega) = \frac{-\theta(\omega)}{\omega} = \frac{\frac{\pi}{2}}{2000\pi} = \frac{1}{4000}$ = 0.25msec

23. Ans: (c)

Sol: The maximum frequency ω_m = 8000 π,
f_m = 4000Hz

Nyquist interval = $\frac{1}{2f_m} = \frac{1}{8000}$

= 0.125 msec

24. Ans: (b)

Sol: We know that

Power density $P_D = \frac{P_t G_t}{4\pi d^2}$

Power Received $P_r = P_D.A_e$

$P_r = \frac{P_t G_t}{4\pi d^2} A_e$

Where,

P_t = Transmitter Power

G_t = Gain of transmitting antenna

d = Distance between transmitter and receiver

A_e = Effective area of the receiver

Given that area and distance are doubled

$P_r' = \frac{P_t G_t (2A_e)}{4\pi(2d)^2} = \frac{2P_t G_t A_e)}{4(4\pi d)^2}$

$P' = \frac{P}{2}$

$\therefore$ Amount of received power decreases by a factor of 2

25. Ans: (b)

Sol: Maximum dimensions of antenna D = 3m

Fresnel region range $r = \frac{2D^2}{\lambda}$

$\lambda = \frac{c}{f} = \frac{3\times10^8}{100\times10^6} = 3$

$r = \frac{2\times(3)^2}{3} = 6m$

Aircraft is at distance of 1km = 1000m

Aircraft needs to travel 1000 – 6 = 994m to enter into Fresnel region

26. Ans: (a)

Sol: $S = \frac{\text{Receiver power}}{\text{Bit rate}}$

$\text{Bit rate} = \frac{\text{Receiver power}}{S} = \frac{5\,nW}{1nW/Mbps} = 5Mbps$

27. Ans: (b)

Sol: $P_t = 0.1mW = 0.1\times10^{-3} = 1\times10^{-4} = -40dB$

$P_r = 1nW = 1\times10^{-9} = -90dB$

Total losses = $(P_t)dB - (P_r)dB = -40dB + (-90)dB = 50dB$

Attenuation = $\frac{50dB}{20km} = 2.5dB/km$

28. Ans: (d)

Sol: Dry oxidation compared to wet oxidation produces superior quality with lower growth rate.

29. Ans: (c)

30. Ans: (c)

Sol: Macros are already pre-designed cells hence there is no need to design it

31. Ans: (b)

Sol: The photoresist layer is exposed to UV light to mark the regions where diffusion is to take place

32. Ans: (c)

33. Ans: (c)

34. Ans: (d)

Sol: All are cryptography algorithm used for encryption and decryption.

35. Ans: (d)

Sol: $T_A = \frac{2000 \text{ bits}}{1\text{Mbps}} = 2 \text{ ms}$

$T_P = 4 \text{ km} \times 5 \text{ ms/km} = 20 \text{ ms}$

$RTT = (T_P + 2T_P) = 42 \text{ ms}$

36. Ans: (c)

Sol: ARP: Address Resolution Protocol

It maps logical address (IP address) into physical address (MAC address)

37. Ans: (c)

Sol: MAC Address (48 bits) = 6Bytes

38. Ans: (d)

Sol: ALOHA, Ethernet (CSMA/CD) and Token Bus (Token) are 3 different ways for channel access in bus topology.

39. Ans: (d)

Sol: Hosts = N

Links (In fully Mesh) = $^NC_2 = \frac{N\times(N-1)}{2} = \frac{10\times 9}{2} = 45$

40. Ans: (b)

Sol: $\uparrow B_{max} \propto \frac{V}{f\downarrow}$

Here $V\rightarrow$ constant, $f \rightarrow$ decreased to half

$\Rightarrow B_{max}$ increased to double, which will drive the core in to deep saturation and also I_μ is very high to create double the rated flux.

41. Ans: (b)

Sol: Ideal transformer has,

1. Resistance negligible
2. Leakage flux negligible
3. Core losses negligible
4. B-H loop linear.

42. Ans: (d)

Sol: $Z_{new} = Z_{old} \times \left(\frac{VA_{new}}{VA_{old}}\right)\left(\frac{V_{old}}{V_{new}}\right)^2$

$= 0.9\times\left(\frac{50}{25}\right)\left(\frac{33}{11}\right)^2$

43. Ans: (a)

Sol: At max efficiency,

Iron loss = full load Cu. Loss

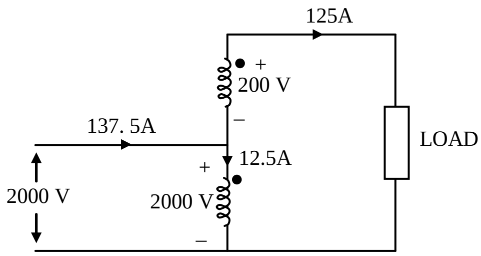
$\therefore$ full load Cu. Loss = 1000W

At half load, Cu. loss = $\frac{1}{4}\times 1000$

= 250 W.

44. Ans: (b)

Sol:



Full-Load kVA rating of Auto-transformer

$= V_2 I_2$

$= 2200 \times 125$

= 275 kVA

45. Ans: (d)

Sol: The approximate expression for regulation is given by $\frac{I}{V}(r_{eq}\cos\phi + x_{eq}\sin\phi)$

(Lagging loads only are considered since they cause more regulation). Differentiate w.r.t ϕ and equate to zero

46. Ans: (b)

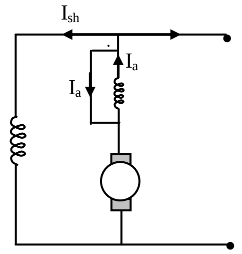
Sol: **Open circuit test** is convenient to conduct on LV side by opening H.V winding due to the following reasons:

1. If the test is conducted on LV side, LV source sufficient to conduct the test to maintain rated flux.
2. If the test is conducted on LV side, low range meters are sufficient to conduct the test.
3. As magnitude of no-load current is more on LV side, this high no-load current can be accurately measured on LV side when compared to HV side.

Short circuit Test: As rated current is less on HV side, it is convenient to conduct this test on HV side by short circuiting LV terminals. By doing so low range of meters can be used for conducting this test.

47. Ans: (d)

Sol:



In cumulative compound generator

$\Rightarrow \phi_{resultant} = \phi_{sh} + \phi_{se}$

as series field winding shorted

$\Rightarrow \phi_{se}$ reduced to zero

$\therefore$ resultant flux ($\phi_{resultant}$) reduced

But terminal voltage, $V \propto E_g \propto \phi_r$

$\Rightarrow$ as $\phi_r \downarrow \Rightarrow E_g \downarrow \Rightarrow V\downarrow$

$\therefore$ Resultant voltage will becomes less than 200V.

48. Ans: (b)

Sol: From data $\Rightarrow I_a$ is constant

($\because I_a$ is supplied from constant current source)

From data $\Rightarrow$ as I_f is supplied from constant voltage source,

ϕ = constant ($\because \phi \propto I_f$)

$$I_f = \frac{V}{R_{sh}} = \text{constant}$$

$\therefore$ $T \propto (\phi.\ I_a)$ = constant irrespective of motor speed.

49. Ans: (d)

Sol: Series motor, characteristics,

(for series motor, $\varphi \propto I_{sh}\ \alpha\ I_a$)

Torque Vs load

$\Rightarrow T \propto I_a^2 \Rightarrow$ parabola

Speed Vs load

$$\Rightarrow N \propto \frac{1}{I_a} \Rightarrow \text{Rectangular hyperbola.}$$

The efficiency of machine is different at different value of power output. As the output increases, the efficiency increases till it reaches a maximum value. As the output is further increased, the efficiency starts decreasing.

50. Ans: (c)

Sol: For differential compound motor,

$\phi_r = \phi_{sh} - \phi_{se}$

As load $\uparrow \Rightarrow I_a \uparrow \Rightarrow \phi_{se} \uparrow \Rightarrow \phi_r \downarrow$

But $\uparrow N \alpha \frac{1}{\phi \downarrow} \Rightarrow$ as $\phi_r \downarrow \Rightarrow N \uparrow$

51. Ans: (b)

Sol: The mechanical power developed by the motor is $P_m = E_b I_a$

Now $P_m = VI_a - I_a^2 R_a$

Since, V and R_a are fixed, power developed by the motor depends upon armature current. For maximum power, dP_m/dI_a should be zero.

$\therefore \frac{dP_m}{dI_a} = V - 2I_a R_a = 0$

$\Rightarrow I_a R_a = \frac{V}{2}$

Now, $V = E_b + I_a R_a$

$= E_b + \frac{V}{2} \left[\because I_a R_a = \frac{V}{2}\right]$

$\therefore E_b = \frac{V}{2}$

52. Ans: (d)

Sol: A commutator converts alternating voltage to a direct voltage and vice versa

53. Ans: (a)

Sol: In DC series motor $T \propto I_a^2$

$T_1 = 20$ N-m $\qquad T_2 = ?$

$I_{a_1} = 3A \qquad I_{a2} = 6A$

$T_2 = \left[\frac{6}{3}\right]^2 \times 20 \Rightarrow T_2 = 80N - m$

54. Ans: (b)

Sol: Terminal voltae of the machine is depends on reistance and shunt field flux (nothing but field current)

Inter poles are used to nullify the effect of cross magnetization

55. Ans: (b)

Sol: Maximum Torque (T_{max}) = $\frac{180}{2\pi N_S} . \frac{E_2^2}{2.X_2}$

$\Rightarrow T_{max} \propto E_2^2 \propto E_1^2 \propto V^2$

$$T_{max\ (new)} = T_{max\ (old)}.\ \frac{(0.9)^2}{(1)^2}$$

$$= (0.81).\ T_{max\ (old)}$$

Reduction in torque = 1– 0.81 = 0.19

$\therefore$ Maximum torque decreases by 20%.

56. Ans: (a)

Sol: The torque equation in a poly-phase induction motor is

$$T_{em} = \frac{180}{2\pi N_s} \times \frac{sE_2^2 R_2}{R_2^2 + (sx_2)^2}$$

At small values of slip, $R_2 >> sx_2$

$\therefore sx_2$ is negligible

$$\Rightarrow T_{em} = \frac{180}{2\pi N_S} \times \frac{sE_2^2}{R_2}$$

$\Rightarrow T_{em} \propto s$

$\therefore$ The torque slip characteristic of a poly phase induction motor almost linear at small values of slip because in this range of slips the effective rotor circuit resistance is very large compared to the rotor reactance.

57. Ans: (b)

Sol: At maximum torque, $S_{T_{max}} = \frac{R_2}{X_2}$

At starting slip = 1

$$\therefore \frac{R_2}{X_2} = 1$$

$\Rightarrow R_2 = X_2$

58. Ans: (b)

Sol: Speed of motor $N_r = 750$ rpm

Slip = 0.04

$N_r = N_s (1 – s)$

$750 = N_s(1 – 0.04)$

$$N_s = \frac{750}{0.96} = 781.25\ \text{rpm}$$

$$N_s = \frac{120f}{p} = 781.25\ \text{rpm}$$

f = 26.04 Hz

59. Ans: (c)

Sol: Given data,

$I_{sc} = 5I_{FL}$ and $S_{FL} = 0.04$

$$\frac{T_{st}}{T_{FL}} = x^2 \left(\frac{I_{sc}}{I_{FL}}\right)^2 S_{FL}$$

$$\frac{T_{st}}{T_{FL}} = (1)^2 \left[\frac{5I_{FL}}{I_{FL}}\right]^2 \times 0.04$$

$$= 1$$

Note: Assume DOL method.

60. Ans: (a)

Sol: If salient pole synchronous motor is considered, it have two components in torque expression. They are
(i) Electro magnetic torque.
(ii) Reluctance torque.

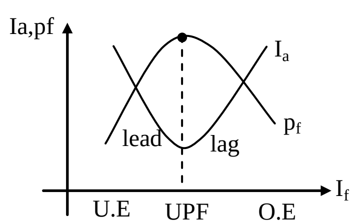
61. Ans: (c)

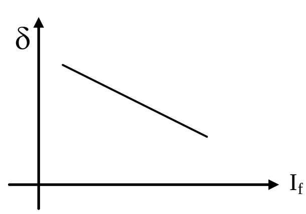
Sol: An overexcited synchronous motor under no-load condition behaves as a capacitor or synchronous condenser.

Function of synchronous condenser:-
1. To improve power factor
2. To improve voltage profile
3. Efficiency increases
4. Power handling capacity increases.
5. Synchronous condenser is a dynamic condenser

62. Ans: (a)

Sol:





at lag I_f increase then Pf ↓ I_a ↑ δ ↓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63. Ans: (a)

Sol:

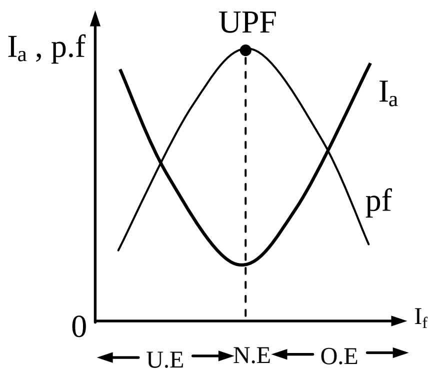


Fig. 2

64. Ans: (c)

Sol: $P_{wind} \propto D^2V^3$

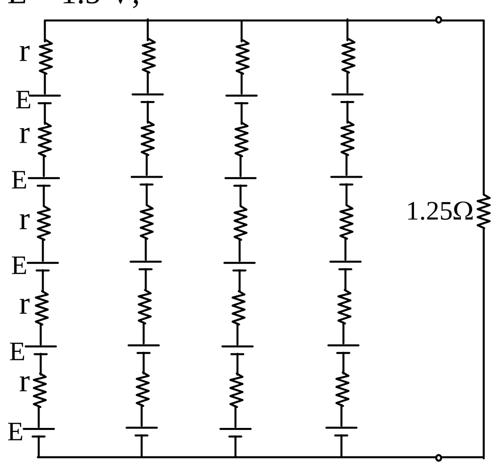
Where

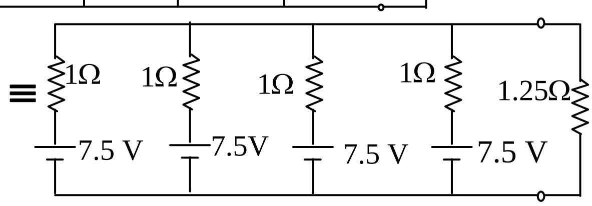
V is wind speed

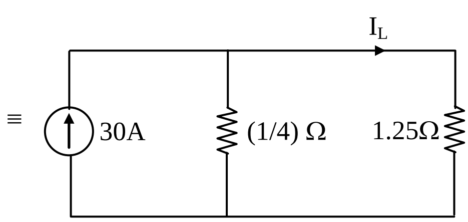
D is diameter

65. Ans: (c)

Sol: E = 1.5 V,







$$I_L = 30 \times \frac{0.25}{1.5} = 5 \text{ A}$$

66. Ans: (b)

Sol: $P = \frac{735.5}{75} \times Q \times W \times H \times \eta$ Watts

$P \propto Q \times H \times \eta$ Watts

From the above equation power output of hydro –electric power plant depends on discharge, head and efficiency.

67. Ans: (a)

Sol: x(n) = {1,0,–1,0}

h(n) = {1,2,4,8}

$$\begin{bmatrix} 1 & 8 & 4 & 2 \\ 2 & 1 & 8 & 4 \\ 4 & 2 & 1 & 8 \\ 8 & 4 & 2 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ 0 \\ -1 \\ 0 \end{bmatrix} = \begin{bmatrix} -3 \\ -6 \\ 3 \\ 6 \end{bmatrix}$$

So, y(n) = {–3, –6, 3, 6}

68. Ans: (a)

Sol: Condition for stability of LTI System is $\int_{-\infty}^{\infty} |h(t)| dt < \infty$

69. Ans: (a)

Sol: Given y(n + 2) – 5y(n + 1) + 6y(n) = x(n)

Apply z-transform

$Y(z) = \frac{X(z)}{z^2 - 5z + 6} = \frac{X(z)}{(z-2)(z-3)}$

Characteristic equation is

(z – 2)(z – 3) = 0

Poles are 2, 3.

Poles are lies outside the unit circle. So, it is unstable system. So, statement (I) is correct.

A system is unstable if the roots of the characteristic equation lies outside the unit circle. So, statement (II) is correct.

70. Ans: (d)

Sol: MGS has impurities such as Fe, Al and heavy metals. So, during reaction of MGS with dry HCl other chloride impurities are formed like $FeCl_3$ which fortunately have boiling points that are different from that of $SiHCl_3$. This allows us a technique called fractional distillation to be used, there by separating pure $siHcl_3$ from other chloride impurities.

71. Ans: (a)

Sol: Both statement (I) and (II) are individually true and statement (II) is correct explanation of statement (I).

In symmetric key cryptography, block by block encryption and decryption.

In asymmetric key cryptography, byte by byte encryption and decryption.

72. Ans: (a)

Sol: Both Statement (I) and (II) are individually true and Statement (II) is correct explanation of Statement (I).
IP is based on packet switching.

73. Ans: (d)

Sol: Regulation of an ideal Transformer is zero, hence **Statement (I)** is false

74. Ans: (b)

Sol: Damper windings are used in a salient pole alternator to eliminate the hunting i.e., to reduce the rotor mechanical oscillations, but not for the voltage fluctuations.
Suppose the excitation is suddenly change, induced voltage changes. This is not effected by dampers. If the voltage fluctuations lead to speed fluctuations then dampers come in to play.
Statement (II) is correct.

75. Ans: (a)