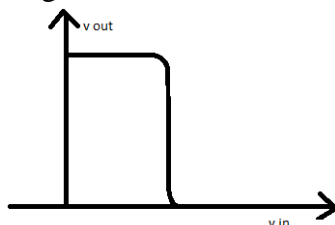


## Electronics Engineering

## Sample Paper-2

Q.1- Figure shown represents the voltage transfer characteristics of



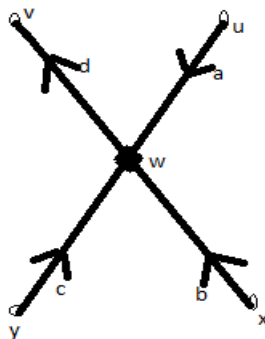
- (a) NMOS Inverter with enhancement mode      (b) NMOS Inverter with Depletion mode  
(c) A CMOS Inverter      (d) A BJT Inverter

Q.2- Which of following is in correctly method?

Group-1	Group-2
(p) BJT	Early effect
(q) MOS Capacitor	Pinch off voltage
(r) LASER Diode	Population Inversion
(s) JFET	Flat Band Voltage

- (a) P&Q      (b) Q&S      (c) P&R      (d) R&S

Q.3- In the Signal flow graph shown below. The correct relationship is



- (a)  $w = au + bx + cy - dv$       (b)  $w = au + bx + cy$   
(c)  $w = au + bx + dv$       (d)  $w = au + cy + bx - dw$

Q.4- The close loop transfer fxn of a control system is given by

$$\frac{C(s)}{R(s)} = \frac{1}{1 + S}$$

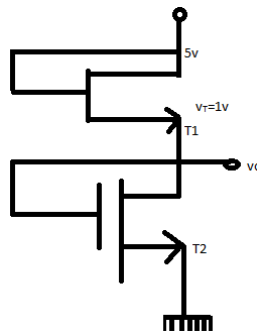
For input  $r(t) = \sin t$ , the steady state volume  $c(t)$  is give by:-

- (a)  $\frac{1}{\sqrt{2}} \cos t$       (b) 1      (c)  $\frac{1}{\sqrt{2}} \sin t + \frac{1}{2} e^{-t}$       (d)  $\frac{1}{\sqrt{2}} \sin (t - \frac{\pi}{2}) + \frac{1}{2} e^{-t}$

Q.5-  $P_{\max} = 100$  mwatt at  $T = 25^{\circ}\text{C}$  free air temperature and maximum junction temperature  $T_{j\max} = 125^{\circ}\text{C}$  its thermal resistance is

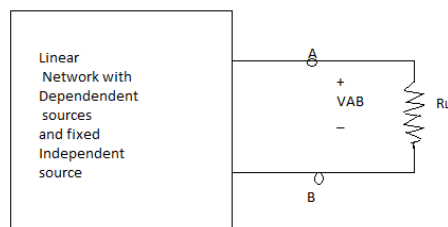
- (a)  $100^{\circ}\text{C/watt}$       (b)  $1000^{\circ}\text{C/watt}$       (c)  $10^{\circ}\text{C /watt}$       (d)  $10000^{\circ}\text{C/watt}$

Q.6- Both  $T_1$  &  $T_2$  are respectively  $36 \mu\text{A/V}^2$  and  $9 \mu\text{A/V}^2$  and cut in voltage or threshold voltage ( $v_T$ ) is one volt . The o/p voltage “vo” are



- (a) 1v      (b) 2v      (c) 3v      (d) 4v

Q.7- In the following linear circuit, it is given that  $V_{AB} = 4\text{v}$  and  $R_L = 10\text{k}$ , and  $V_{AB} = 1\text{V}$ , &  $R_L = 2\text{k}$



The value of thevenin resistance and voltage for the network “N” is given by

- (a)  $16 \Omega, 30\text{v}$       (b)  $30\text{k} \Omega, 16\text{v}$       (c)  $3\text{k} \Omega, 6\text{v}$       (d)  $50\text{k} \Omega, 30\text{v}$

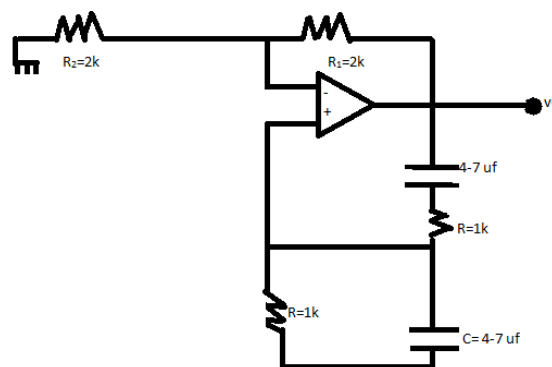
Q.8- Match the List I and List II as given below

List I (Amplifier configuration)	List II (Application)
A. CE amplifier	1. Low band width and high input impedance
B. CB amplifier	2. Audio frequency amplifier
C. JFET amplifier	3. Radio frequency amplifier
D. CC amplifier	4. Microwave amplifier
	5. Buffer amplifier

Codes:

(a) A2	B1	C5	D4
(b) A4	B3	C1	D5
(c) A2	B3	C1	D5
(d) A5	B4	C3	D2

Q.9- Determine the frequency of oscillator of the circuit as shown below. Assume op-amp be ideal?



(a) 192.76 rad/sec      (b) 212.76 rad/sec      (c) 202.76 rad/sec      (d) 232.76 rad/sec

Q.10- State equation are represented by

$$\dot{X} = \begin{bmatrix} 0 & 1 \\ -2 & -1 \end{bmatrix} X + \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix} u$$

The Eigen value are

(a) 1, -1      (b)  $-0.5 \pm j 1.323$       (c) -1, -1      (d) +1, +1

Q.11- A system is having a damping ratio of 1.25 and  $\omega_n$  (natural frequency) of 200 rad/sec and D.C gain of "1".

The response of system to a unit step input is

(a)  $1 + \frac{5}{3} e^{-50t} - \frac{2}{3} e^{-150t}$       (b)  $1 + \frac{1}{3} e^{-100t} - \frac{4}{3} e^{-400t}$   
 (c)  $1 - \frac{4}{3} e^{-100t} + \frac{1}{3} e^{-400t}$       (d)  $1 + \frac{2}{3} e^{-50t} - \frac{5}{3} e^{-150t}$

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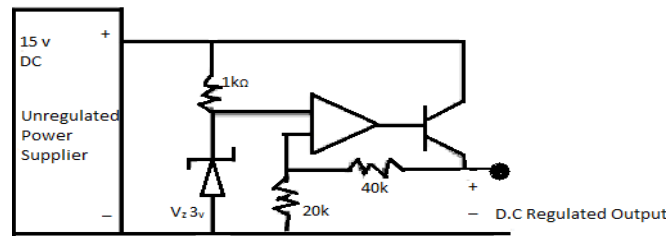
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Q.12- The output voltage of regulated power supply in fig is as below:-



- (a) 3v                      (b) 6v                      (c) 9v                      (d) 12v

Q.13- The closed loop transfer function of a system is given by

$$\frac{C(S)}{R(S)} = \frac{50}{S(1+ST)(1+0.5S)+50}$$

Find the value of ‘T’ such that the system is driven on to verge of instability and find Resulting frequency of oscillation.

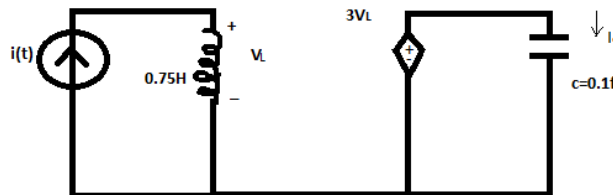
- (a)  $T = \frac{1}{48}$ ,  $w = 9.8 \text{ rad/sec}$                       (b)  $T = \frac{1}{41}$ ,  $w = 19.7 \text{ rad/sec}$   
 (c)  $T = \frac{2}{41}$ ,  $w = 7.8 \text{ rad/sec}$                       (d) None of these

Q.14- The forward transfer function of a unity feedback “type 1”, 2<sup>nd</sup> order system has a pole at -2 the nature of Gain K is so adjusted that the damping ratio is 0.4. The above equation is subjected to the input  $r(t) = 1 + 4t$

Find steady state error?

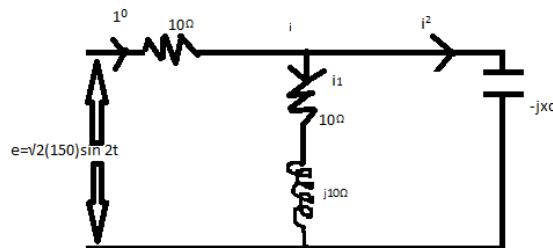
- (a)  $e_{ss} = 1.28$                       (b)  $e_{ss} = 2.94$                       (c)  $e_{ss} = 1.12$                       (d)  $e_{ss} = 1.02$

Q.15-  $L(t) = 2 \sin 2t$  in the following circuit



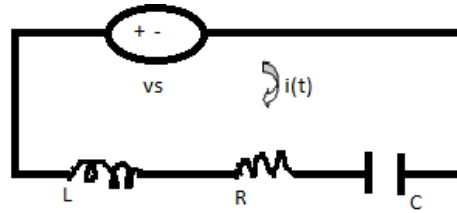
- (a)  $1.8 \sin 2t$                       (b)  $-1.8 \sin 2t$                       (c)  $-0.9 \cos 2t$                       (d)  $0.9 \cos 2t$

Q.16- In the given circuit below, e, and “i” are in phase calculate phase angle between “e” and “i”,



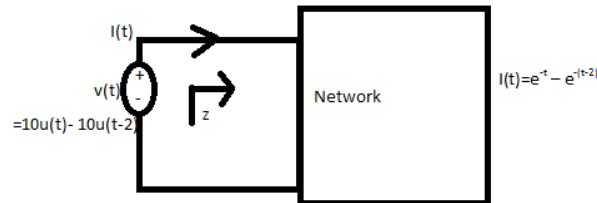
- (a)  $-45^\circ$                       (b)  $45^\circ$                       (c)  $90^\circ$                       (d)  $63^\circ$

Q.17- Construct the dual network for curves circuit diagram.



- (a) (b) (c) (d)

Q.18- The Impedance of following network consists of



- (a) Resister only (b) Resister and capacitor  
 (c) Capacitor, inductor, resister (d) resister, inductor

Q.19- The step response of RLC series ckt. Is given by

$$\frac{d^2 I(t)}{dt^2} + \frac{2dI(t)}{dt} + 5I(t) = 10$$

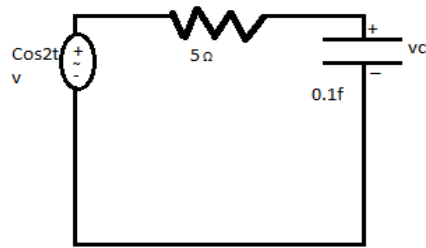
$$I(0+) = 2, \frac{dI(0+)}{dt} = 4$$

Find  $I(t) = ?$

- (a)  $1 + e^{-4t} \cos 4t$  amp (b)  $4 - 2e^{-4t} \cos 4t$  amp  
 (c)  $2 + e^{-4t} \sin 4t$  amp (d)  $10 + e^{-4t} \sin 4t$  amp

Q.20- In the given ckt. Of fig. below

$V_c(t)$  is



- (a)  $1/\sqrt{2} \cos(2t - 45^\circ)v$  (b)  $1/\sqrt{2} \cos(2t+45^\circ)v$   
 (c)  $1/\sqrt{2} \sin(2t-45^\circ)v$  (d) None of these

Q.21- The Integral

$$\frac{1}{2\pi} \int_0^{2\pi} \sin(t - \tau) \cos\tau \, d\tau \text{ equals}$$

- (a)  $\sin t \cos t$  (b) 0 (c)  $\frac{1}{2} \cos t$  (d)  $\frac{1}{2} \sin t$

Q.22- Let  $A = \begin{bmatrix} 2 & -0.1 \\ 0 & 3 \end{bmatrix}$  and  $A^{-1} = \begin{bmatrix} \frac{1}{2} & a \\ 0 & b \end{bmatrix}$  then a+b is equal to

- (a) 7/20 (b) 3/20 (c) 19/60 (d) 11/20

Q.23- The area in first quadrant under curve

$$y = \frac{1}{x^2+6x+10} \text{ is}$$

- (a)  $\frac{\pi}{2}$  (b)  $\frac{\pi}{4} - \tan^{-1} 3$  (c)  $\frac{\pi}{2} - \tan^{-1} 3$  (d)  $\frac{\pi}{2} - \tan^{-1} 3$

Q.24-The Newton Raphson method

$$X_{n+1} = \frac{X_n}{2} + \frac{3}{2X_n}$$

Can be used to solve the equal

- (a)  $x^2=3$  (b)  $x^3=3$  (c)  $x^2=3$  (d)  $x^{-3}=3$

Q.25- The solution of  $x \frac{dy}{dx} + y = x^4$  with the condition

$$Y(1) = \frac{6}{5} \text{ is}$$

- (a)  $y = \frac{x^4}{5} + \frac{1}{x}$  (b)  $y = \frac{4x^4}{5} + \frac{4}{5x}$  (c)  $y = \frac{x^4}{5} + 1$  (d)  $y = \frac{x^5}{5} + 1$

Q.26- Mamta had no \_\_\_\_\_ about going the chairman's clerk and throwing her resignation letter to him.

- (a) Apathy                      (b) Penchant                      (c) Compunction                      (d) Juxtaposition

Q.27- Make the correct word from the meaning given in the question:-

To speak in an indirect manner to evade a point, to mislead

- (a) Prevaricate                      (b) Concede                      (c) Relegate                      (d) Remonstrate

Q.28- Three pipes of varying diameters can fill the vessels of 1,2,and 3 L in 4, 18, and 48 min respectively. What is the ratio of the diameters?

- (a) 6:4:3                      (b)2:3:4                      (c) 1:4:5                      (d)2:5:8

Q.29-  $125^x + 45^x = 2 \cdot (27)^x$  has.....

- (a) No solution                      (b) One solution  
(c) Two solution                      (d) More than two solution

Q.30- If X follows binomial distribution with parameter  $n=8$  and  $p=1/2$  then  $p ( |x-4| \leq 2)$  equals to

- (a)  $\frac{118}{128}$                       (b)  $\frac{119}{128}$                       (c)  $\frac{117}{128}$                       (d) None of these