



QP Code : NP-19679

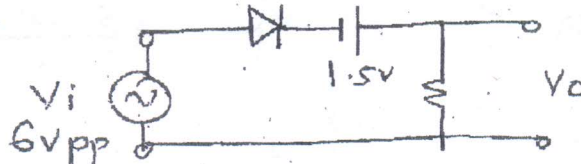
(3 hours)

[Total Marks : 80

- N.B.: (1) Question no. 1 is compulsory.
 (2) Solve any three out of remaining questions.
 (3) Assume suitable data wherever necessary.

1. Solve any four :- 20

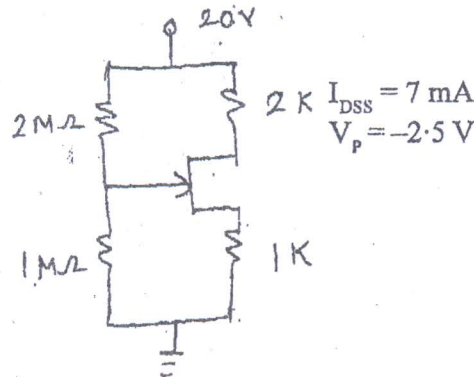
- (a) For the following clipper circuit sketch the i/p and o/p wave form write equation for V_o . 5



- (b) Compare BJT, JFET and MOSFET. 5
 (c) Which components in an amplifier (CS and CE) circuit affect low frequency response? Explain. 5
 (d) State and explain Barkhausen's criteria. 5
 (e) Explain effect of swamping resistor in differential amplifier. 5
 (f) Derive expression of efficiency of class A Transformer coupled amplifier. 5

2. (a) Draw approximate hybrid π model of CE transistor amplifier and derive expressions for A_v , A_i , Z_i and Z_o . 10

(b) Determine operating point and draw DC load line for the circuit shown :- 10



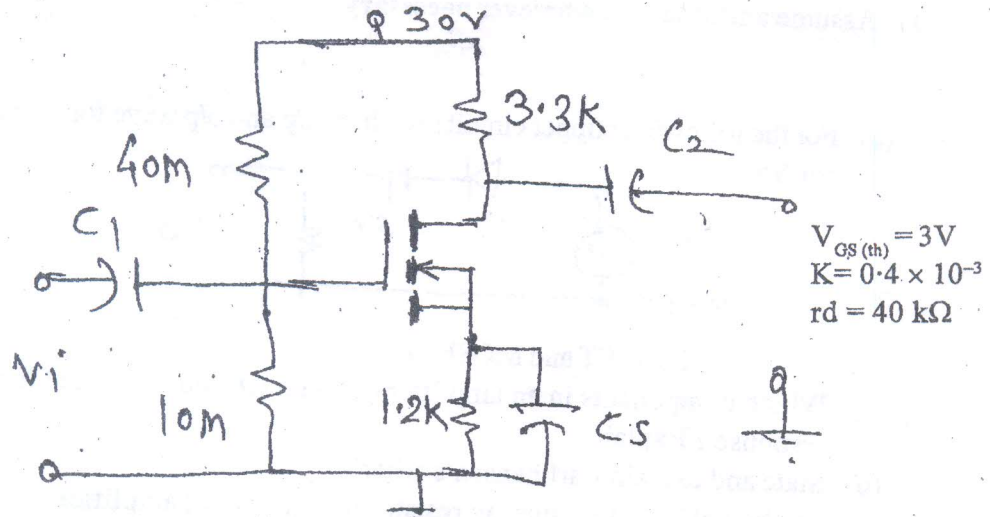
3. (a) Draw two stage CS-CS amplifier circuit and derive expressions for A_v , Z_i and Z_o . 10
 (b) State different types of negative feedback topologies and explain current series in detail using block diagram. 10

4. (a) Draw circuit diagram for dual i/p balanced o/p differential amplifier (using any type of devices) and derive expressions for A_d , A_c , CMRR and R_i . 10

(b) Draw circuit diagram of colpitt's oscillator and explain it's working. State applications, advantages and disadvantages of this circuit. 10

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5. (a) Justify need for constant current source and explain any one in detail. 10
 (b) Explain working of class B (push-pull) power amplifier. 10
6. (a) For the circuit shown find A_v , R_i and R_o . 10



- (b) Draw High frequency model for CS JFET amplifier and explain. 5
 (c) Explain importance and need for biasing in amplifier. 5

Con. 12016-14.

SE Sem IV Elex, EXTC (CBAS)

AM-IV

23/05/2014



QP Code : NP-19713

(3 Hours)

[Total Marks : 80

N.B.: (1) Questions No. 1 is compulsory.
(2) Solve any three from the remaining.

1. (a) Prove that Eigen values of a hermitian matrix are real. 5

(b) Evaluate $\oint_C \frac{e^{kz}}{z} dz$ over the circle $|z|=1$ and k is real. Hence prove 5

that $\int_0^\pi e^{k \cos \theta} \cos(k \sin \theta) d\theta = 2\pi$.

(c) Find the extremal of $\int_{x_2}^{x_1} (16y^2 - (y'')^2 + x^2) dx$ 5

(d) Find a vector orthogonal to both $u = (-6, 4, 2)$ and $v = (3, 1, 5)$. 5

2. (a) Find the curve $y = f(x)$ for which $\int_{x_1}^{x_2} y\sqrt{1+(y')^2} dx$ is minimum subject to the 6

constraint $\int_{x_1}^{x_2} \sqrt{1+(y')^2} dx = \ell$.

(b) Find eigen values and eigen vectors of the matrix $A = \begin{bmatrix} -2 & 5 & 4 \\ 5 & 7 & 5 \\ 4 & 5 & -2 \end{bmatrix}$ 6

(c) Obtain Taylor's series and two distinct Laurent's series expansion of 8

$f(z) = \frac{z^2 - 1}{z^2 + 5z + 6}$ about $z=0$, indicating region of convergence.

3. (a) State Cayley-Hamilton Theroern, hence deduce that $A^8 = 625I$, where 6

$A = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$

(b) Using calculus of Residues, prove that $\int_0^{2\pi} e^{\cos \theta} \cos(\sin \theta - n\theta) d\theta = \frac{2\pi}{n!}$. 6

(c) Find the plane curve of fixed perimeter and maximum area. 8

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Con. 11555-14.

