E/Sem-IV (CBSGS)/ETRX/Discrete Electronic Circuits/
NOV-17

Q.P. Code :10649

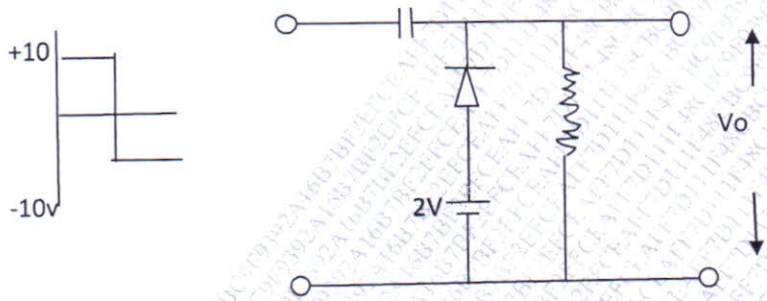
[Time: 3 Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B:
1. Question no1 is compulsory and solve any three questions from remaining.
2. Draw neat and labeled diagrams.
3. Assume suitable data if it is required.

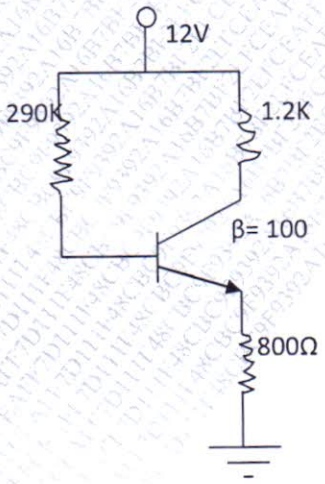
Q.1 Solve any five: **20**

1) Draw the output waveform for following circuit. Identify the type.



2) Explain any one biasing circuit used for E-MOSFET.
3) Explain effect of coupling and by pass capacitors on frequency response of CS amplifier.
4) State advantages of negative feedback.
5) Derive expression for efficiency of Class A Transformer coupled amplifier.
6) Compare CS amplifier with CE amplifier.

Q.2 a) For the given circuit find I_B, V_{CE}, I_{CQ}. **10**



b) Explain working of CS amplifier using JFET and derive formula for voltage gain, Ri and Ro. (using self bias) **10**

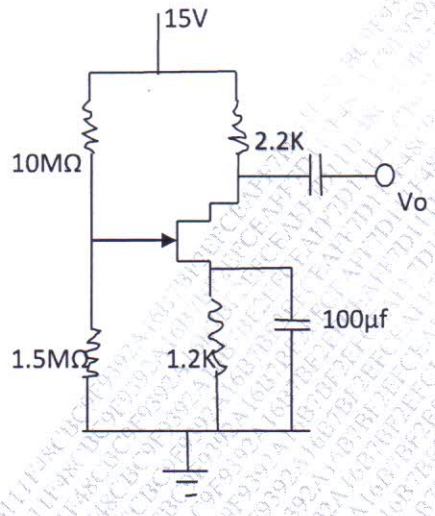
[P.T.O]

Q.3 a) Explain need for cascading amplifier stages. Explain working of CS-CE multistage amplifier and Derive expressions for A_{VT}, Ri and Ro. **12**

b) Explain working of Wein Bridge oscillator with the help of circuit diagram and give equation of frequency of oscillations. **08**

Q.4 a) For dual i/p balanced output diff amp derive expression for Ad and Ac. Suggest modification to improve CMRR. **10**

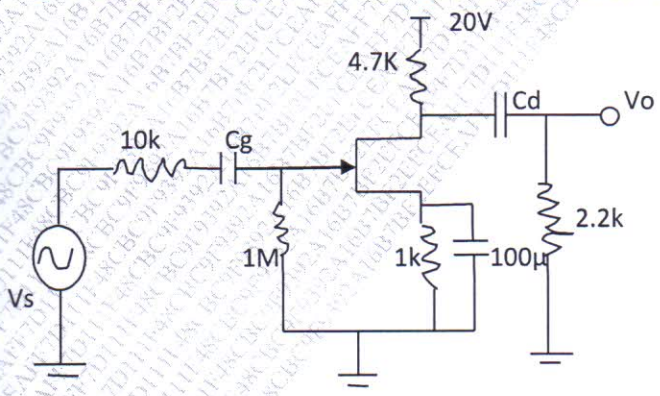
b) For the following circuit calculate Av, Ri and Ro. **10**



I_{DSS}=8mA, Vp=3V, Rd=50k

Q.5 a) Prove that efficiency of Class B transformer coupled power amplifier is 78.5%. Suggest schemes For removing cross over distortion. **10**

b) For the given circuit of CS amplifier find higher cut off frequency. **10**



I_{DSS}=8mA, Vp=-4V, r_d==∞

c_{gd}=2pF, c_{gs}=4pF, c_{ds}=0.5pF, cwi=5pF, cwo=6pF

(cwi & cwo are wiring capacitances at i/p and o/p respectively.)

Q.6 Write short notes on any four: 20

1) Comparison of CB, CE and CC amplifier
2) Current series negative feedback
3) Constant current source (in diff amp)
4) Cascode amplifier
5) Heat sink used in power amplifiers.

Q.P. Code : 26077

[Time: 3 Hours] [Marks: 80]

Please check whether you have got the right question paper.

N.B:
1. Question No. 1 is compulsory.
2. Attempt any three questions from remaining.
3. Assume suitable data if required.
4. Figure to the right indicate full marks.

1. Attempt **any four** from the following: 20

a) Explain any five rules of root locus plot.

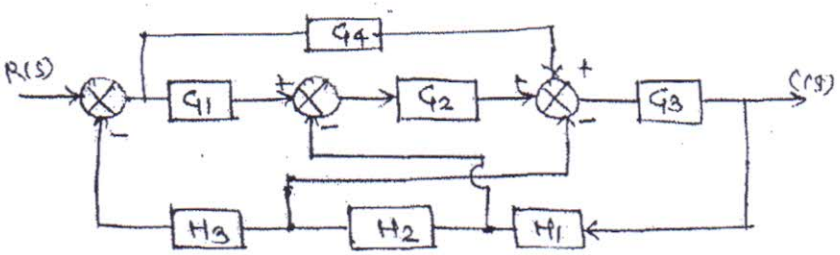
b) What are the properties of state transition matrix.

c) Explain adaptive control system.

d) Describe the Mason's gain formula with an example.

e) Explain need of compensators.

2. a) Obtain the overall transfer function from block diagram. 10



b) Find the solution of following state equation. 10

$$\dot{x}=\begin{bmatrix}-5 & -6\\ 1 & 0\end{bmatrix}x+\begin{bmatrix}1\\ 0\end{bmatrix}u$$

$$y=\begin{bmatrix}1 & 1\end{bmatrix}x$$

3. a) Explain the type of signal which produces a finite steady state error for following system. Also find the steady state error. 10

i) $G(s)H(s)=\dfrac{20}{(S+2)(S+3)}$

ii) $G(s)H(s)=\dfrac{20(S+1)}{S^2(S+2)(S+4)}$

iii) $G(s)H(s)=\dfrac{2.5(S^2+2S+1)}{S(S+1)(S^2+5S+2)}$

b) Derive an Expression for output response of a second order under damped control system. Assume the input to be unit step signal. 10

4. a) Draw the root locus for the system with $G(s)H(s)=\frac{K(S+2)(S+3)}{S(S+1)}$ and comment on stability. 10

b) Determine the stability of the system having characteristic equation 10
$S^5 + S^4 + 2S^3 + 3S + 5 = 0$

5. a) Draw Bode plot and find gain margin and phase margin for 10
$G(s)H(s)=\frac{64(S+2)}{S(S+0.5)(S^2+3.2S+64)}$

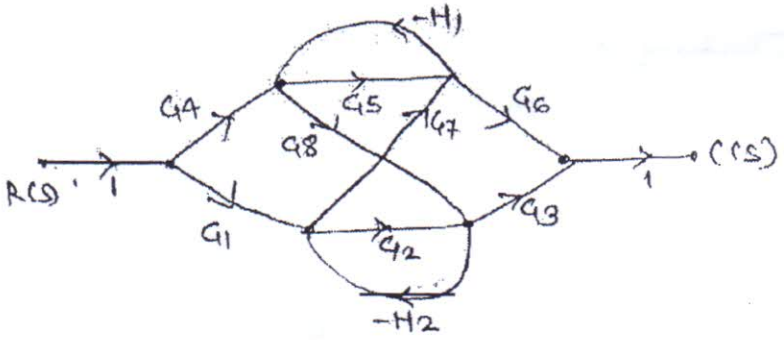
b) Discuss the stability of system using Nyquist plot for $G(s)H(s)=\frac{20}{S(S+4)(S-2)}$. 10

6. Attempt **any two** 20

a) Different composite controllers.

b) Co-relation between time domain and frequency domain specification.

c) Using Mason's gain formula, find the gain of the following system in figure below.



SE / ETRX / Sem-IV - CBSGS / Electrical Machines / NOV. 17

Q.P. Code: 24863

Duration: 3 hrs. **Total marks: 60**

N.B

1. *Question 1 is compulsory*
2. *Solve any **THREE** out of the remaining 5 questions*
3. *Figures on the right indicate full marks*
4. *Assume suitable data if necessary*

Q1. Solve any **THREE** **(15)**

a) A 6 pole, 50Hz Induction motor has a full load speed of 950 rpm. Calculate slip.
b) Derive emf equation of a dc motor.
c) State the important applications of brushless DC motor
d) Explain v/f method of speed control of 3 phase induction motor

Q2. a) Develop equivalent circuit of a 3-phase Induction motor. **(8)**

b) Explain the working of capacitor start Induction motor. **(7)**

Q3. a) Describe the construction and working principle of a variable reluctance motor. **(8)**

b) With neat diagram, discuss the working of a3 point starter in a dc motor. **(7)**

Q4. a) Name different types of unipolar brushless DC motor& describe any one type in detail **(8)**

b) What are the advantages, disadvantages &applications of Switched reluctance motors? **(7)**

Q5. a) Compare 3 phase induction motor with 3 phase synchronous motor. **(7)**

b) Describe torque-slip characteristics of a three phase induction motor in 4 modes **(8)**

Q6. Write short notes on **(15)**

a) Auto-transformer Starting of 3 phase induction motor
b) Permanent magnet synchronous motor
c) Double field revolving theory

SE/ETRX/Sem IV (CBSGS)/Nov 2017

Fundamentals of Communication Engineering

Q.P. Code :26508

[Time: 3 Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B: 1) Question 1 is compulsory and Solve any three from the remaining five questions
2) Assume suitable data if necessary.
3) Figures to the right indicate full marks.

Q.1 Answer any **four** questions from the following: 20

a) Explain the advantages and disadvantages of TRF receiver.

b) What is multiplexing? Compare TDM with FDM.

c) Discuss the need for modulation in wireless communication system.

d) What is AGC? Why is AGC needed in super heterodyne receivers?

e) Compare AM and FM.

Q.2 a) With a neat circuit diagram and waveforms, explain the working of envelope detector. What are its merits and demerits? 04

b) A sinusoidal carrier has amplitude of 10v and frequency 30 KHz is amplitude modulated by a sinusoidal voltage of amplitude 3v and frequency 1 KHz. Modulated voltage is developed across a 50 Ω resistance. i) Write the equation for modulated wave and draw the modulated wave indicating Vmax, Vmin **ii)** Determine modulation Index. And calculate total power in the modulated wave **iv)** Draw the spectrum of modulated wave. 06

c) Explain anyone type of SSB generation and detection with neat diagrams 10

Q.3 a) With the help of a neat circuit diagram, explain the working of Foster Seeley discriminator. What is its disadvantage? 10

b) With a neat block diagram ,discuss the working of Linear Delta modulation, its advantages and disadvantages. 10

Q.4 a) With a neat block diagram, explain the function of each block of Super heterodyne AM receiver. 10

b) State Sampling theorem. Explain the two sampling techniques. What is aliasing error? How is it overcome? 10

Q.5 a) Explain the terms with reference to Radio receivers: Selectivity, Sensitivity, Fidelity and Double spotting 10

b) Discuss the generation and demodulation of PWM signal. For a sinusoidal modulating signal, draw PPM, and PWM pulses 10

Q.6 Write short notes on any **four:**

a) FM wave generation using Armstrong method

b) ISB Transmission

c) Pre emphasis and De emphasis circuits with waveforms

d) Skywave Propagation

e) Noise triangle

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