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**B.E DEGREE EXAMINATIONS APRIL/MAY 2013**

**DEPARTMENT OF ELECTRICAL ANDELECTRONICS ENGINEERING**

**THIRD SEMESTER FULL TIME (R 2008)**

**EC9215 ELECTRONIC DEVICES AND CIRCUITS**

**TIME:3hrs**

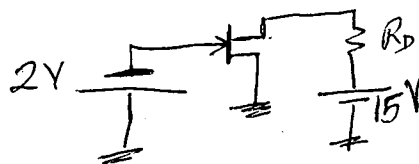
**MAX MARKS:100**

**INSTRUCTIONS:ANSWER ALL QUESTIONS**

**Part A**

**10x2=20marks**

- 1.What is meant by Zener breakdown
- 2.Draw a PN –junction showing the depletion region assuming P type semiconductor is lightly doped.
- 3.What are the regions of operation of MOSFET.
- 4.Find the drain current of the JFET shown below.  $I_{DSS}=12\text{mA}$  and  $V_{GS\text{OFF}}=-3\text{V}$



- 5.Compare the voltage gain of CB and CC amplifiers
- 6.The maximum gain of CS amplifier is -10. What is the gain at its half power points.
- 7.Mention the types of neutralization methods
- 8.Draw a BIMOS Cascode amplifier.
- 9.In Hartley osallation calculate the frequency of oscillation if  $L_1= 10\text{mH}$  ,  
 $L_2=1\text{mH}$  and  $c =1\text{nF}$
- 10.A current shunt feedback amplifier has a loopgain of 5 and input impedance of 4K. Calculate input impedance of basic amplifier

PART B

(5x16=80marks)

11(i) Draw the structure of NMOS and explain the  $V-I$  characteristics of MOSFET (12)

(ii) Draw the output characteristics of CE amplifier and mark its regions of operation. (4)

12(a) (i) How Zener diode can be used as regulator (8)

(ii) Explain Drift and diffusion currents (8)

OR

(b)(i) Briefly explain Laser diode (6)

(ii) Derive the current equation of P-N junction diode (10)

13(a) Draw a CE amplifier and write its features. Draw the small signal model and derive for  $A_{VS}$ ,  $A_{IS}$ ,  $R_{IN}$  and  $R_O$  of the amplifier

OR

(b)(i) In a MOSFET common drain amplifier  $g_m = 5\text{mA/V}$ ,  $R_O = 1\text{M}\Omega$  and  $R_s = 5\text{K}$  (6) calculate the voltage gain and the output resistance of amplifier. Also draw the amplifier circuit.

(ii) Explain any two biasing methods of MOSFET with the location of the operating point on both output characteristics and transfer characteristics. (10)

14(a)(i) What is neutralization and explain the methods of neutralization used in tuned amplifiers. (8)

(ii) Draw a single tuned amplifier with its equivalent circuit derive for  $A(f)$  and cut-off frequencies (8)

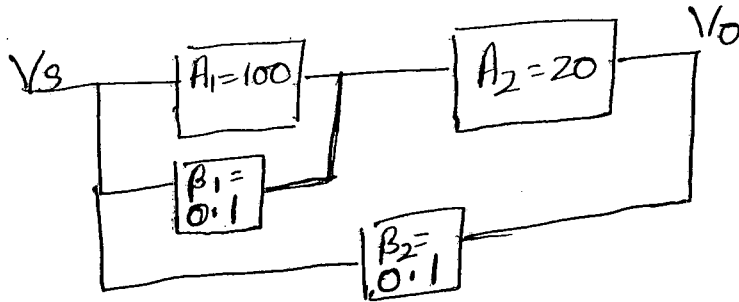
OR

(b) Draw differential amplifier and its equivalent circuit. Derive for its differential gain Common mode gain and CMRR How CMRR can be improved.

15(a)(i) With the topological diagram current series feedback derive for  $G_{mf}$ ,  $R_{if}$  and  $R_{of}$ . (8)

(ii) Draw and amplifier circuits having voltage series and voltage shunt feedback. (4)

(iii) Calculate the overall  $A_{vf}$  (4)



OR

(b)(i) With circuit diagram and its equivalent circuit of RC phase shift oscillator, explain how conditions for oscillation are met. (10)

(ii) Design a wein Bridge oscillator to generate a sine wave with a frequency of 10KHZ Draw the designed circuit. (6)