Duration: 3hrs **Max. Marks: 80**

N.B. : (1) Question **No. 1 is compulsory**.

(2) Solve any **three** questions from the **remaining five**

(3) Figures to the right indicate full marks

(4) Assume suitable data if necessary and mention the same in answer sheet.

Q No.1		Attempt **any 5** questions	
	a	Compare Depletion and Enhancement MOSFET.	**5**
	b	Why LC oscillators are preferred for high frequency applications.	**5**
	c	Draw small signal model of JFET & explain each parameter.	**5**
	d	Write down current equation of diode and explain significance of each parameters.	**5**
	e	State and explain Barkhausen's criteria for oscillations.	**5**
	f	Find Q point for the following circuit shown in fig.1. Assume β=100 and V_{BE}=0.6V	**5**

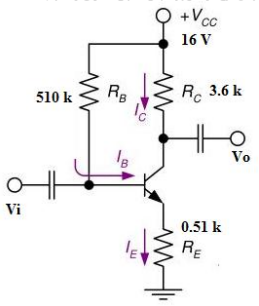

Fig.1

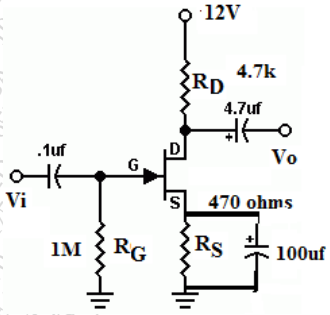

Fig.2

Q No.2			
	a	Explain the working of wein bridge oscillator and derive the expression for frequency of oscillation.	**10**
	b	Derive the expression for voltage gain, Current gain, Input impedance and output impedance for bypassed voltage divider CE BJT amplifier.	**10**
Q No.3			
	a	Explain Construction and operation of varactor diode.	**10**
	b	For JFET amplifier shown in fig.2, find Av, Ri, Ro. Assume FET parameters: I_{DSS}=8mA, V_P= -3V, r_d =100kΩ	**10**

Q No.4

a Determine Av, Ai, Ri, Ro for unbypassed BJT amplifier shownin fig.3. Assume β=120 and V_{BE}=0.6V. **10**

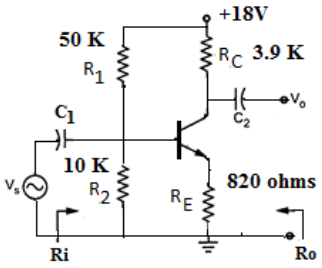

Fig.3

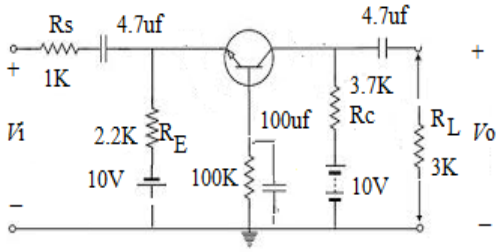

Fig.4

b For the circuit shown in fig.4 Determine voltage gain, Input and output impedance. Assume β=120 and V_{BE}=0.7V. **10**

Q No.5

a For MOSFET amplifier shown fig 5 . Determine Av, Zi, Zo . Assume MOSFET DATA: K_N = 1 MA/v^2 , V_{TN} = 0.7 v (10 M)

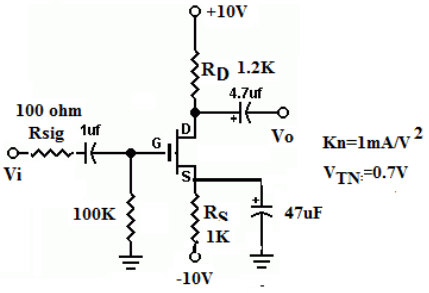

Fig.5

b Define stability factor. Derive the expression for stability factor of voltage divider bias. Explain which biasing technique is more stable.

Q No.6 Write short notes on **(any Two)**

a D.C. load line & significance of Q pt. **10**

b Clipping Circuit **10**

e Comparison of BJT CE & JFET CS Amplifier **10**

****