

**B. TECH. SEM – III (BIOMEDICAL ENGG.) (2014 COURSE) (CBCS)  
: WINTER - 2017**

**SUBJECT: ANALOG ELECTRONICS**

Day: **Monday**  
Date: **15/01/2018**

**W-2017-2056**

Time: **10.00 AM TO 01.00 PM**  
Max. Marks: **60**

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat and labeled diagrams **WHEREVER** necessary.
- 4) Use of non-programmable **CALCULATOR** is allowed.

- Q.1** a) Describe the need of bias stabilization in transistors. (06)  
b) Define  $\alpha$  and  $\beta$  terms in transistor and derive relation between them. (04)

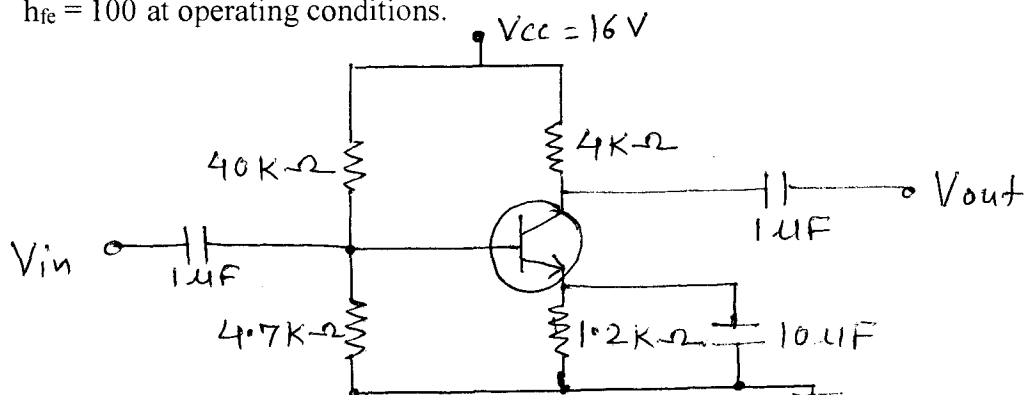
**OR**

- Q.1** a) Discuss Thermal runaway process in detail. (06)  
b) Draw voltage divider biasing circuit and mention its advantages. (04)

- Q.2** A voltage source of internal resistance  $R_s = 900 \Omega$  drives a C.C amplifier using load resistance  $R_L = 2k \Omega$ . The CE h-parameters has  $h_{ie} = 1200 \Omega$ ,  $h_{re} = 2 \times 10^{-4}$ ,  $h_{fe} = 60$  and  $h_{oe} = 25 \mu A/V$ . Compute: -  $A_i$ ,  $R_i$ ,  $A_v$ ,  $R_o$  using approximate analysis and exact analysis. (10)

**OR**

- Q.2** Determine the input impedance, output impedance, voltage gain and current gain of CE amplifier using h-parameters as shown in fig with  $h_{ie} = 3.2k \Omega$ ,  $h_{fe} = 100$  at operating conditions. (10)



- Q.3** Describe the operation of p-channel JFET with drain characteristics. (10)

**OR**

- Q.3** Describe following parameters of JFET: (10)  
i) Drain resistance  
ii) Transconductance  
iii) Amplification factors  
Describe relation between above three parameters.

**P. T. O**

**Q.4** Discuss the operation of n-channel depletion type MOSFET with  $V_{GS} = 0V$ ,  $V_{GS} < 0V$  and draw drain and transfer characteristics of n-channel depletion type MOSFET. **(10)**

**OR**

**Q.4 a)** Discuss operation of CMOS as Inverter. **(06)**

**b)** Discuss finite output resistance and Body effect in MOSFET. **(04)**

**Q.5** Define clipper circuit. Discuss operation of biased and unbiased negative clipper circuits with input and output waveforms. **(10)**

**OR**

**Q.5 a)** Define multivibrator circuit. Discuss any multivibrator circuit with waveforms. **(06)**

**b)** Discuss the operation of Full wave voltage doubler circuit. **(04)**

**Q.6 a)** Discuss the construction and features of Light emitting diode with applications. **(06)**

**b)** Discuss applications of photodiode. **(04)**

**OR**

**Q.6** Discuss in details rules of preparing artwork in PCB making process. **(10)**

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