

**B. Tech. Sem – III (Biomedical Engg.) (2014 COURSE) (CBCS) :  
SUMMER - 2019**

**SUBJECT: ANALOG ELECTRONICS**

Day: Saturday  
Date : 11/05/2019

Time: 02.30 PM TO 05.30 PM  
Max. Marks. 60

S-2019-2585

**N.B.**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat diagram **WHEREVER** necessary.

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**Q.1** Describe the Thermal runaway process in detail with diagram. Explain voltage divider biasing circuit with advantages. **(10)**

**OR**

Define stability factor. Derive the general expression for stability factor and mention stability factor for fixed bias circuit. **(10)**

**Q.2** Draw Hybrid model of a transistor for Common Emitter, Common Base and Common Collector configurations with equations for input voltage and output current. **(10)**

**OR**

A CE amplifier is driven by a voltage source of internal resistance  $R_S = 800\Omega$  and load impedance  $R_L = 1000\Omega$ . **(10)**

The h-parameters are  $h_{ie} = 1K\Omega$ ,  $h_{re} = 2.5 \times 10^{-4}$ ,  $h_{fe} = 50$ ,  $h_{oe} = 25\mu A/V$

Calculate :  $A_i$ ,  $R_i$ ,  $A_v$  and  $R_o$  by using Exact Analysis method.

**Q.3** a) Differentiate between BJT and FET with symbols. **(06)**  
b) Explain applications of FET. **(04)**

**OR**

Discuss the following parameters of JFET: **(10)**

- i) Drain resistance
- ii) Transconductance
- iii) Amplification factor

Derive the relation between above parameters.

**Q.4** a) Differentiate between JFET and MOSFET. **(06)**  
b) Explain the operation of CMOS as an Inverter **(04)**

**OR**

Discuss the operation of n-channel Enhancement type MOSFET in detail with transfer characteristics. **(10)**

**Q.5** Draw and explain working of simple and biased negative clipper circuits with input and output waveforms. **(10)**

**OR**

- a) Draw and explain voltage doubler circuit. **(06)**
- b) Explain the applications of clipper and clamper circuits. **(04)**

**Q.6** a) Discuss the construction, operation and applications of LDR **(06)**  
b) What is photovoltaic cell? Explain with diagram. **(04)**

**OR**

Discuss in detail the types of PCBs and PCB design rules. **(10)**

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