

**B. TECH. SEM - III (ELECTRONICS) 2014 COURSE) (CBCS) :**

**WINTER - 2017**

**SUBJECT: ANALOG ELECTRONICS**

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

**W-2017-2037**

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** Define stability factor. Derive the general expression for stability factor for common emitter configuration. **(10)**

**OR**

- Q.1** a) Draw fixed bias circuit and describe the thermal runaway process for fixed bias. **(06)**  
b) Discuss the operation of transistor as a switch. **(04)**

**Q.2** Draw and analyse common base amplifier and common collector amplifier with respect to hybrid model. **(10)**

**OR**

**Q.2** A voltage source of internal resistance  $R_s=1K\Omega$  drives a common collector amplifier using load resistance  $R_L=4K\Omega$ . A CE h-parameters has  $h_{ie}=1200\Omega$ ,  $h_{re}=2\times 10^{-4}$ ,  $h_{fe}=60$  and  $h_{oe}=25\mu A/V$ . Calculate  $A_i, R_i, A_v$  and  $R_o$  using approximate analysis. **(10)**

**Q.3** a) Describe the construction of n-channel JFET in detail. **(06)**  
b) Draw and explain transfer characteristic for JFET. **(04)**

**OR**

**Q.3** Draw and discuss operation of common source and common gate configuration of JFET amplifier. **(10)**

**Q.4** Describe the operation of p-channel depletion type MOSFET with transfer characteristics. **(10)**

**OR**

- Q.4** a) Differentiate between JFET and MOSFET **(06)**  
b) Discuss operation of CMOS as inverter **(04)**

**Q.5** Draw and describe simple and biased series clipper circuits with output waveforms. **(10)**

**OR**

- Q.5** a) Define voltage multiplier circuit. Discuss operation of half wave voltage doubler. **(06)**  
b) Discuss applications of clipper and clamper circuit. **(04)**

**Q.6** a) Describe operation and construction of photoconductive cell **(06)**  
b) Discuss applications of photodiode **(04)**

**OR**

- Q.6** a) Differentiate between LED and Photodiode **(06)**  
b) Describe following parameters in PCB designing process, **(04)**  
i) Hole diameter  
ii) Component polarity identification

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