

B.TECH SEM - III (2007 COURSE) (BIOMEDICAL ENGG.) :
SUMMER - 2018
SUBJECT: ELECTRONIC DEVICES AND CIRCUITS-I

Day : **Tuesday**
Date : **22/05/2018**

S-2018-2592

Time : **02.30 PM TO 05.30 PM**
Max. Marks: 80

N. B. :

- 1) **Q. No.1 and Q. No.5 are COMPULSORY.** Out of remaining attempt **ANY TWO** questions from section I and section II.
- 2) Figures to the right indicate **FULL** marks.
- 3) Both the sections should be written in **SEPARATE** answer book.
- 4) Assume suitable data, if necessary.

SECTION-I

- Q.1** a) Differentiate between metals, insulators and semiconductors using energy band diagrams. (05)
b) Write a note on: Need of bleeder resistance in filter. (04)
c) Explain the parameters which affect stability of Q point. (05)
- Q.2** a) Explain different types of variable capacitors. (07)
b) Describe briefly materials used for inductor and transformer. (06)
- Q.3** a) Derive an expression for ripple factor of an L-section filter. (06)
b) Draw and explain Bridge- Rectifier circuit with waveforms. (07)
- Q.4** a) What is the condition for thermal stability? Explain briefly the phenomenon of thermal runaway. (06)
b) Define α , β and γ of a transistor. Show how they are related to each other? (07)

SECTION-II

- Q.5** a) List the benefits of h parameters. (04)
b) What do you understand by 'pinch off voltage' and 'cut off voltage'? (05)
c) Explain the rules of preparing PCB layout. (05)
- Q.6** a) Draw a typical common emitter amplifier and explain the function of each component in it. (06)
b) Consider a CE transistor amplifier with collector load resistance $R_c = 4 \text{ k}\Omega$, collector to base feedback resistance $R_B = 40 \text{ k}\Omega$ and a source resistance $R_S = 10 \text{ k}\Omega$. The transistor parameters are $h_{ie} = 1.1 \text{ k}\Omega$, $h_{fe} = 50$, $h_{re} = h_{oe} = 0$. Calculate the voltage gain, the input resistance looking from the source terminals and the output resistance. (07)
- Q.7** a) Explain working of a n-channel E-MOSFET with its transfer characteristics. (07)
b) For JFET, if $I_{DSS} = 20 \text{ mA}$, $V_{GS(OFF)} = -5 \text{ V}$, and $g_{m0} = 4 \text{ mS}$. Determine the transconductance for $V_{GS} = -4 \text{ V}$ and find I_D at this point. (06)
- Q.8** a) State various properties of PCB laminates and describe briefly at least one of them. (06)
b) Explain the fabrication process for double sided printed through holes boards. (07)

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