

B.TECH SEM - III (2007 COURSE) (BIOMEDICAL ENGG.) :
WINTER - 2017

SUBJECT : ELECTRONIC DEVICES AND CIRCUITS-I

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

W-2017-2387

Time : **10.00 AM TO 01.00 PM**
Max. Marks : **80**

N.B.

- 1) Q.1 and Q.5 are **COMPULSORY**. Out of the remaining attempt any **TWO** questions from each Section.
- 2) Answers to both the sections should be written in **SEPARATE** answer book.
- 3) Assume suitable data if necessary.
- 4) Draw neat and labeled diagrams wherever necessary.

SECTION – I

- Q.1**
- a) Discuss the colour codes used to identify various resistances in brief. (05)
 - b) Write a note on: Need of bleeder resistor in filter (04)
 - c) What is early effect? Explain how it affects the BJT characteristics in CB configuration. (05)
- Q.2**
- a) Explain different types of fixed capacitors. (07)
 - b) Define volt equivalent of temperature. How mobility and diffusion are related? Are diffusion and drift currents different? If so, how? (06)
- Q.3**
- a) Explain the working of a full-wave rectifier with the help of circuit diagram and waveforms. (07)
 - b) A $5K\Omega$ load is fed from a bridge rectifier connected across a transformer secondary whose primary is connected to 460 V, 50 Hz supply. The ratio of number of primary turns to secondary turns is 2:1. Calculate d. c. load current, d.c. load voltage, ripple voltage and P.I.V. rating of diode. (06)
- Q.4**
- a) Draw circuit diagram of voltage divider bias circuit using CE configuration and explain how it stabilizes operating point. (07)
 - b) What is thermal runaway? Explain need of bias stabilization in BJT amplifier circuits. (06)

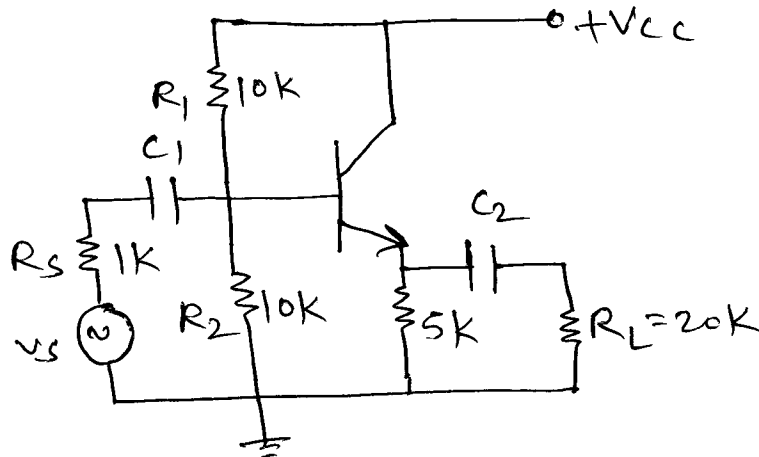
SECTION – II

- Q.5**
- a) Draw and describe the 'h' parameter equivalent circuit for typical common emitter amplifier. (04)
 - b) Sketch typical drain characteristic for n-channel JFET. Explain the shape of the characteristic and identify the regions. (05)
 - c) Give reason: Analog and digital grounds are routed separately on PCB and are combined only at one stable ground point. (05)

P.T.O.

Q.6 a) Compare CE, CB and CC amplifier configurations. (06)

b) In the CC circuit shown in following figure the transistor parameters are h_{ic} (07)
 $= 1.2 \text{ K}\Omega$, $h_{fc} = -101$. Calculate the circuit input and output resistances,
current gain and voltage gain.



Q.7 a) With the help of neat diagram explain the construction and operation of an (07)
n-channel enhancement type MOSFET.

b) Prove that for the JFET (06)

$$g_m = \frac{-2I_{DSS}}{V_p} \left[1 - \frac{V_{GS}}{V_p} \right]$$

Q.8 a) Explain the fabrication process of single sided printed circuit board. (07)

b) Explain important precautions to be taken while preparing a PCB layout. (07)

* * *