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EC 131402 BINA CHOWDHURY CENTRAL LIBRARY
(GIMT & GIPS)

Roll No. of candidate

Azara, Hatkhowapara,
Guwahati -781017

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2019

B.Tech. 4th Semester End-Term Examination

ANALOG ELECTRONIC CIRCUITS

(New Regulation)

(W.e.f. 2017-18)

Full Marks – 70

Time – Three hours

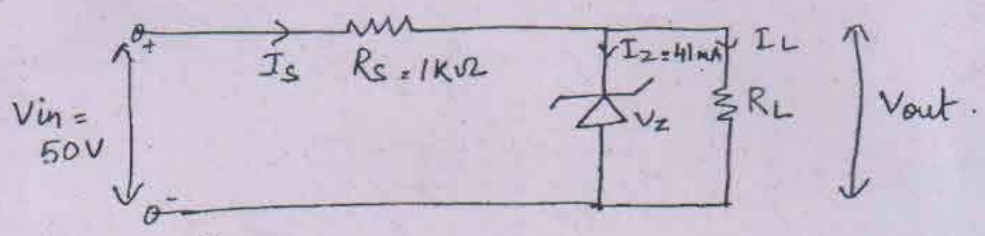
The figures in the margin indicate full marks
for the questions.

Answer question No. 1 and any *four* from the rest.

1. (i) Give the meaning of the word 'ideal' as applied to a device. (1)
- (ii) What does the term 'clamping' mean? (1)
- (iii) Why a transistor needs proper biasing? (1)
- (iv) Define Stability Factor. (1)
- (v) What is pinch-off voltage of a JFET? (1)
- (vi) List down the h-parameters for BJT. (1)
- (vii) What is PIV? (1)
- (viii) Define Thermal Runaway. (1)
- (ix) What is Seo Rate (SR)? (1)
- (x) Under what conditions does a transistor act as a switch and as an amplifier. (1)

[Turn over

2. (a) Define 'Stability factor'. Draw a self bias circuit using BJT and determine its stability factor. (2+3=5)
- (b) A CE transistor amplifier with self bias circuit is designed to establish the Q pt at (2MA,12V), $S \leq 5.1$, $V_{CC}=24V$, $V_{BE}=0.7V$, $\beta=50$ and $R_C=4.7k\Omega$. Determine the values of R_1, R_2 and R_E . (10)
3. (a) For the Voltage Regulator circuit, determine the range of R_L and I_L that will result in V_{out} being maintained at 5V. (7)



- (b) (i) For a collector to base bias, it is required to set the Qpt at (1MA,6V) with $V_{CC}=10V$, $\beta=100$ and $V_{BE}=0.3V$.
- (ii) What will be the new Qpt if $\beta=50$, other values remaining same? (5+3=8)
4. (a) An ac supply of 230V is applied to a half wave Rectifier circuit through transformer of turns ratio 5:1. Assume the diode is an ideal one. The load resistance is 300Ω . Find. (8)
- (i) dc output voltage
- (ii) PIV
- (iii) Maximum power delivered to load.
- (iv) average power delivered to load.
- (b) Draw and explain the hybrid- π model of a transistor. What is the physical origin of the two capacitors in hybrid- π model? (5+2=7)

5. (a) Draw the inverting, non-inverting and voltage follower circuits of an Op-Amp with relevant expressions of closed loop gain in the circuits. (8)
- (b) List the five characteristics of an amplifier which are modified by negative feedback. (7)
6. (a) Give the two Barkhausen conditions required in order for sinusoidal oscillations to be sustained. (5)
- (b) Draw and determine the frequency of oscillation of Wien-bridge oscillator. (10)
7. Write short notes on (any three): (3×5=15)
- (a) R-C coupled Amplifier
- (b) Push-pull Class β Amplifier
- (c) Enhancement-ONLY MOSFET
- (d) Current-Mirror.

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