

GANPAT UNIVERSITY
B.TECH SEM. III - MECHATRONICS ENGINEERING
REGULAR EXAMINATION NOV/DEC - 2011
2MC305/MC304 ANALOG CIRCUITS & DEVICES

Time: 3 Hours

Total Marks: 70

Instructions:

- 1). All questions are **compulsory**.
- 2). Figures to the **right** indicate full marks.
- 3). Answers to the two sections must be written in **separate** answer books.
- 4). Assume all necessary data.

Section - I

Que:-1 Attempt All. [12]

- (A) Explain the Schmitt trigger using Opamp.
- (B) Explain the Quadrature oscillator.
- (C) Explain the DC analysis of differential amplifier.

OR

Que:-1 Attempt All. [12]

- (A) Explain the peak detector using Opamp.
- (B) Explain the Wien bridge oscillator.
- (C) Derive the output gain for single and differential ended output in AC analysis.

Que:-2 (A) Explain summing, scaling and averaging amplifier using inverting configuration. [07]
 (B) Describe how series regulators work. [04]

OR

Que:-2 (A) For the voltage series feedback amplifier, Derive the equation for the following. [07]
 a) Close loop voltage gain.
 b) Input resistance with feedback.
 c) Output resistance with feedback.
 (B) Describe three basic topologies of switching regulators. [04]

Que:-3 Attempt All. [12]

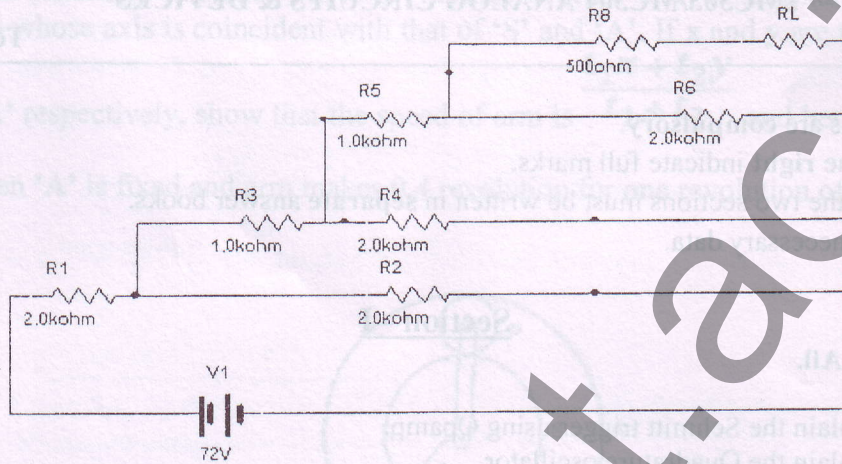
- (A) Explain the saw tooth wave generator.
- (B) Explain the 555 timer as monostable multivibrator
- (C) Explain following terms.
 1. CMRR.
 2. Input Bias Current.
 3. Output Voltage Swing.
 4. Slew Rate.

Section - II

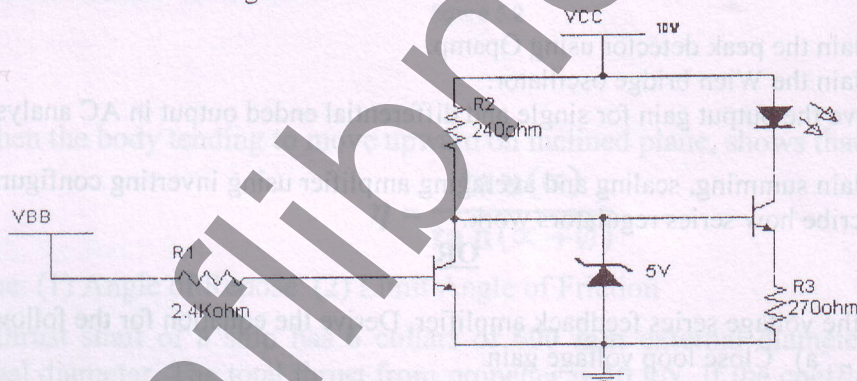
Que:-4 Attempt All.

[12]

- (A) Find the load current and voltage for load resistor of 1Kohm. Apply Thevenin theorem.



- (B) Explain common emitter connection for BJT with its characteristics curves.
 (C) Calculate current through LED when $V_{BB} = 0V$ and $V_{BB} = 10V$.

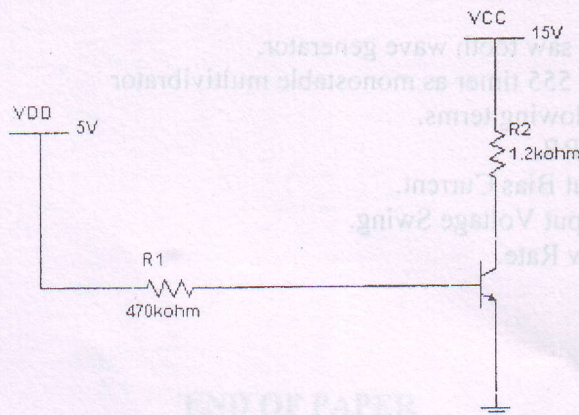


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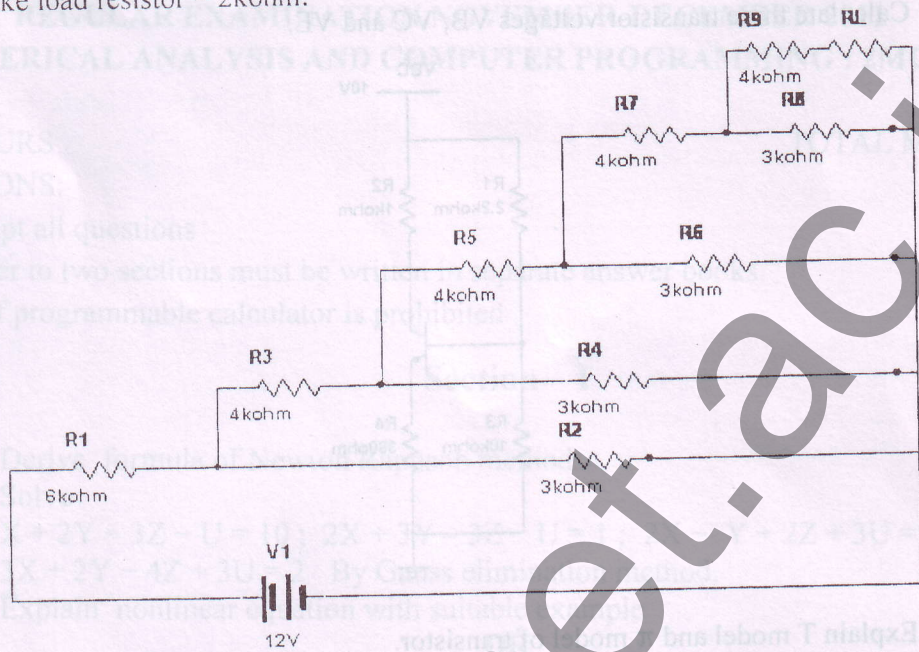
Que:-4 Attempt All.

[12]

- (A) Calculate power dissipation for following circuit.

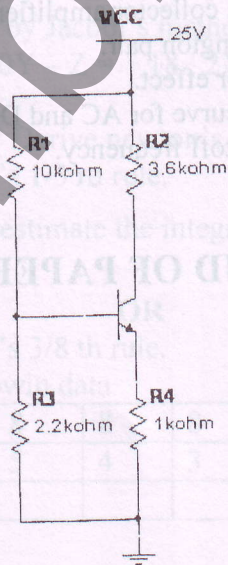


- (B) Calculate the load current and voltage for following circuit using Thevenin theorem.
Take load resistor = 2kohm.



- (C) Explain the importance of emitter bias over base bias.

- Que:-5 (A) What is the collector emitter voltage for following VDB circuit. [04]

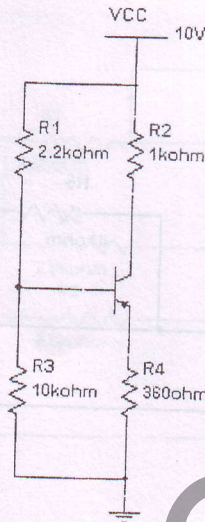


- (B) Draw base biased amplifier circuit & explain its working. [04]
(C) Draw swamped amplifier circuit & derive equation of voltage gain & input impedance. [03]

OR

Que:-5 (A) Calculate three transistor voltages V_B , V_C and V_E .

[04]



(B) Explain T model and π model of transistor.

[04]

(C) Draw circuit diagram for two stage feedback amplifier and explain its working.

[03]

Que:-6 Attempt Any Three.

[12]

(A) Draw and explain common collector amplifier.

(B) Write a short note on Darlington pair.

(C) Write a short note on Miller effect.

(D) Draw frequency response curve for AC and DC amplifier and write equations of voltage gain in terms of cutoff frequency.

END OF PAPER