

Date: 08/12/2014

Student Exam No. _____

GANPAT UNIVERSITY

B. Tech. Semester: III MC Engineering
Regular Examination November – December 2014
(2MC305) ANALOG CIRCUITS & DEVICES

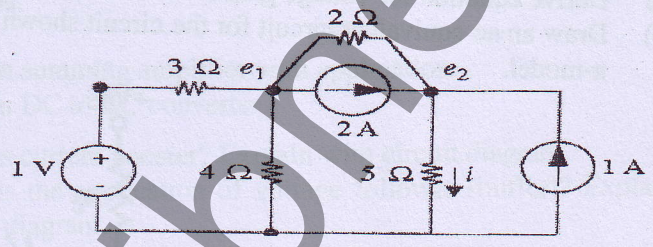
Time: 3 Hours

Total Marks: 70

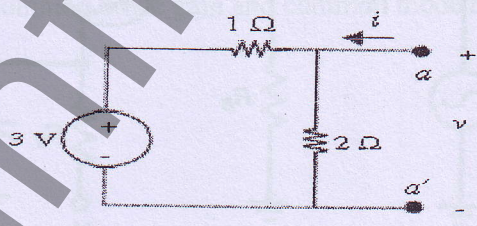
- Instruction:
1. Attempt all questions.
 2. Figure to right indicate full marks of the question.
 3. Answer to each section must be written in separate answer book.
 4. Assume suitable data, if necessary.
 5. Draw sketches whenever required.

Section-I

Que.-1 (a) Determine the unknown current (i) in the following circuit using node method. 6

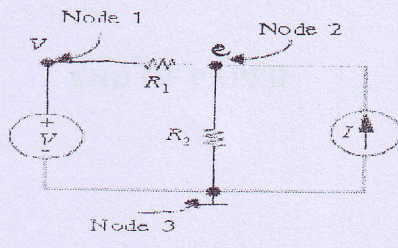


(b) Find the Thévenin equivalent for following circuit. 6

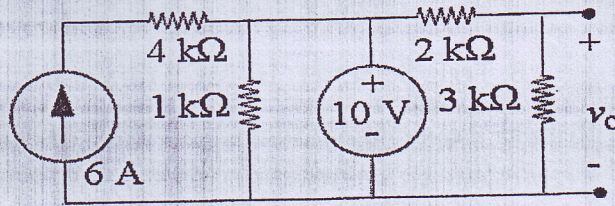


OR

Que.-1 (a) Determine the voltage (e) at node 2 in the following circuit using node method. 6



- (b) Find out v_o in the following figure using principle of superposition. 6



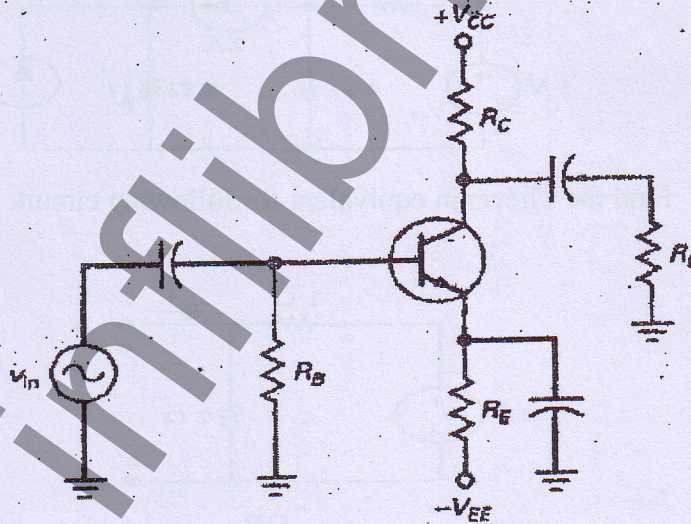
- Que.-2** (a) Draw direction of flow of current and electrons in both NPN and PNP connection. Define Alpha and Beta for transistor. 5
 (b) Explain the output characteristic of CE Transistor. 6

OR

- Que.-2** (a) Explain Hard and soft saturation in detail. 6
 (b) What is load line? Explain how to find saturation and cut off point. 5
- Que.-3** (a) Explain Accurate VDB analysis. 6
 (b) What is role of Bypass capacitor in Emitter biased amplifier? And define good bypassing. 6

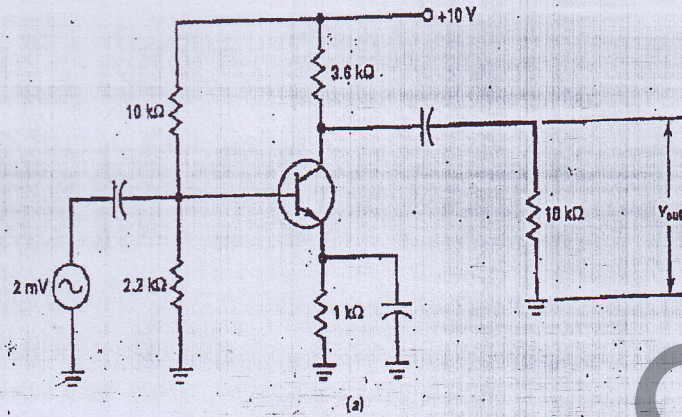
Section - II

- Que.-4** (a) Derive equation for voltage gain for π Model and T Model. 6
 (b) Draw an ac equivalent circuit for the circuit shown with the help of π -model. 6



OR

- Que.-4** (a) Find out Output voltage for the following circuit. 10



- (b) The ac collector voltage (V_E) is inverted, 180° out of phase with the input voltage (V_{in}). Why? 2
- Que.-5** (a) Derive the equation of gain for op-amp as inverting amplifier, also draw its circuit diagram. 4
- (b) How can we use op-amp to find rate of change of input (differentiation)? Explain with the derivation of equation and circuit. 4
- (c) Derive the equation of gain for differential amplifier using AC analysis. 3

OR

- Que.-5** (a) Explain summing amplifier with application. 4
- (b) Explain DC to DC converter. 4
- (c) What is current booster? Explain with circuit diagram. 3
- Que.-6** (a) What is the application of voltage follower (buffer)? Explain with circuit diagram. 4
- (b) If $R_C = 1.3 \text{ M}\Omega$, $V_{CC} = 15 \text{ V}$, $V_{EE} = -15 \text{ V}$, common mode Input voltage = 1 mV and $R_E = 2 \text{ M}\Omega$ in single ended output configuration of differential amplifier, What would be the output voltage? 4
- (c) What is common mode gain and common mode rejection ratio? 4

END OF PAPER