

GANPAT UNIVERSITY

B. Tech. Semester III Mechatronics Engineering
Regular Examination November – December 2013

2MC305 Analog Circuits & Devices

Time: 3 Hours

Total Marks: 70

- Instruction:**
1. All questions are compulsory.
 2. Figures to right indicate full marks.
 3. Draw the figures wherever necessary.
 4. Assume necessary data.

Section - I

Que. - 1 (a) Draw and explain three regions in context of collector curve for CE 12
 configuration.

(b) Find AC output voltage across the load resistor in multistage amplifier if $R_G=600\Omega$ and for both stage $R_1=10K$, $R_2=2.2K$, $R_C=3.6K$, $R_E=1K$, $V_{CC}=10V$, $\beta=100$ and input is 1mv pp, $R_L=10K$.

OR

Que. - 1 (a) Prepare the schematic diagram of the circuit which drives 12 V-2 12
 A(max.) DC motor in presence of illumination.

(b) Draw and explain working of zero crossing detectors.

Que. - 2 (a) What are the techniques to find location of Q-point? Explain in detail. 11

(b) Explain the variation in current gain of the transistor.

OR

Que. - 2 (a) Analyze of VDB amplifier using π model and derive the equation of 11
 gain.

(b) What are the transistor approximations?

Que. - 3 Attempt all 12

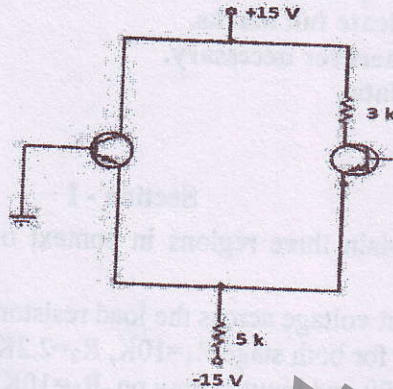
(a) Derive the equation for the efficiency of class A amplifier.

(b) Differentiate class A, class B and class C amplifier with figure.

(c) What are the frequencies ranges of different communication devices.

Section - II

- Que. - 4 (a) Explain D.C. Analysis of Differential amplifier with circuit diagram. 12
(b) What are the currents & voltages in single ended output circuit given Below. (fig.1) Calculate (1) I_T (2) I_E (3) V_C without second approximation and with second approximation.



OR

- Que. - 4 (a) Draw schematic diagram of 741 Op-Amp. 12
(b) Name the negative feedback circuits and explain any two with circuit diagram.

- Que. - 5 (a) Differentiate coupling capacitor and bypass capacitor with all necessary figures, also write down rules for the same. 11
(b) Explain multistage amplifier with figure.

OR

- Que. - 5 (a) What is the reason for clipping of large signals? What can be done to avoid it? Explain with figure. 11
(b) Enlist various applications of transistors from the perspective of their region of operations.

- Que. - 6 Attempt any three 12
(a) Briefly explain The current mirror circuit.
(b) What is the function of Inverting amplifier? Explain it with voltage gain.
(c) What are the types of ICs? Explain all.
(d) Explain type of JFET briefly.

END OF PAPER