GANPAT UNIVERSITY
B. Tech. Semester: IV (EC) Engineering
Regular Examination April – June 2017
2EC403: Analog Electronics

Time: 3 Hours

Total Marks: 60

Instruction:
1. Attempt all questions.
2. Answers to the two sections must be written in separate answer books.
3. Figures to the right indicate full marks.
4. Assume suitable data, if necessary.

SECTION-I

1 (A) Derive input resistance R_{if}, Output resistance R_{of} without load resistance and output resistance R'_{of} with load resistance of current shunt feedback amplifier with negative feedback. **7**

(B) A single stage transistor amplifier has a voltage gain of 600 without feedback, and 50 with feedback. Calculate the percentage of output which is feedback to input **3**

OR

1 (A) Draw and explain voltage, current, transconductance and transresistance amplifier and compare the characteristics. **5**

(B) Derive Av, Avf, Rif, Rof and R'of equation of the emitter follower circuit. **5**

2 (A) Draw functional block diagram of IC 555 timer and explain function of each pin. **6**

(B) Write the condition of oscillation in feedback oscillators. **2**

(C) Define the negative feedback and derive expression for transfer gain of amplifier with negative feedback. **2**

OR

2 (A) Using block diagram explain the working principle of shunt voltage regulator. **5**

(B) Draw and explain Oscillator with RC feedback circuits. **5**

3 (A) Explain working of astable multivibrator design using timer IC-555 in detail. Write the T_{on}, T_{off} and duty cycle equation. **7**

(B) Define following voltage regulators terms with equation.
(i) Load regulation (ii) Line regulation **3**

SECTION-II

4 (A) Draw and explain first order low pass butterworth filter design using Op-amp. Also derive its gain equation as a function of frequency. **6**

(B) What are the characteristics of an ideal op-amp? **4**

OR

4 (A) Design first order high pass butterworth filter using Op-amp have a cutoff frequency of 1KHz with a passband gain of 2. **4**

(B) Define following electrical parameters of Op-amp.
(i) Input offset voltage (ii) input resistance (iii) CMRR (iv) Slew rate **6**

5   **(A)**   Draw and explain averaging amplifier and summing amplifier design using Op-amp in noninverting configuration.

       (B)   Draw and explain voltage follower and inverter circuit design using Op-amp.   **4**

OR

5   **(A)**   Draw and explain sawtooth wave generator circuit design using op-amp.   **5**

       (B)   Draw and explain noninverting amplifier with feedback design using Op-amp. Also   **5** derive its close loop voltage gain equation.

6   **(A)**   Draw and explain the integrator circuit design using op-amp.   **5**

       (B)   Write a short note on different types of active filters and its response.   **5**

END OF PAPER