

## GANPAT UNIVERSITY

M.Tech. Semester: II (Electronics and Communication) Engineering

Regular CBCS Examination May – June 2014

RF Circuits - 3EC 205

Time: 3 Hours

Total Marks: 70

1. **Instruction:** 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

- |          |   |   |   |
|----------|---|---|---|
| Que. – 1 | 1 | Discuss about Hartley oscillator design using general common emitter BJT. | 6 |
|          | 2 | Describe about Crystal Oscillators.                                       | 6 |
| OR       |   |   |   |
| Que. – 1 | 1 | Describe about Resonator oscillators.                                     | 6 |
|          | 2 | Discuss about Leeson's model for oscillator phase noise.                  | 6 |
| Que. – 2 | 1 | Write short note on reactive diode multiplier.                            | 6 |
|          | 2 | Write short note on solid state microwave sources.                        | 5 |
| OR       |   |   |   |
| Que. – 2 | 1 | Discuss about resistive diode multiplier.                                 | 6 |
|          | 2 | Write short note on microwave tubes used as microwave sources             | 5 |
| Que. – 3 |   | Write short note on following.  |   |
|          | 1 | Hybrid Microwave Integrated circuits.                                     | 4 |
|          | 2 | Third order intercept point   | 4 |
|          | 3 | System aspects of Antenna in microwave communication systems.             | 4 |

## Section – II

- Que. – 4
- 1 Discuss about Y factor method for measuring the equivalent noise 6
  - 2 Derive equations for overall noise figure of a 4-stage cascaded system. 6

OR

- Que. – 4
- 1 An X band amplifier has a gain of 20 dB and a 1GHz bandwidth. Its equivalent noise temperature is to be measured via Y factor method. These data have been obtained, for  $T_1 = 290^{\circ}\text{K}$ ,  $N_1 = -62 \text{ dBm}$  and  $T_2 = 77^{\circ}\text{K}$ ,  $N_2 = -64.7 \text{ dBm}$ . Determine the equivalent noise temperature of the amplifier. If amplifier is used with a source having an equivalent noise 6
  - 2 Derive equations for overall noise figure of a 3-stage cascaded system. 6

- Que. – 5
- 1 Explain with suitable equations about Low Noise Amplifier design procedure. 6
  - 2 Explain about Varactor diode with suitable details used for high frequency operations. 5

OR

- Que. – 5
- 1 Classify dynamic ranges with required equations. Discuss the concept of given compression of non-linear amplifier. 6
  - 2 What is the significance of stability circles in the design of microwave amplifier? Also define various two port power gains. 5

- Que. – 6
- 1 Write short note on power amplifiers. 4
  - 2 Write short note on Intercept point of a cascaded systems. 4
  - 3 Write short note on single stage transistor amplifier design. 4

END OF PAPER