Seat No. | | | | | | |

* 1 8 2 9 *

मध - 013

Analog Communication
(1110)

P. Pages : 2

Time : Three Hours **Max. Marks : 100**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Attempt **any two** sub questions from each unit.
5. Assume suitable data if necessary.
6. Figures to right indicate full marks.
7. Use of non programmable calculator is allowed.

UNIT - I

1. a) Draw and explain communication system in detail. **10**

b) Discuss the types and effects of noise. Explain Internal noise in detail. **10**

c) i) Explain need for modulation. **5**

ii) Derive equation for noise voltage for thermal noise. **5**

UNIT - II

2. a) Derive the equation for AM signal along with waveform. **10**

b) An audio frequency signal $10\sin(2\pi 500t)$ is used to amplitude modulate a carrier $50\sin(2\pi \times 10^5 t)$. Calculate modulation index, frequencies of upper side band and lower side band, required bandwidth & total power delivered to the load of 600Ω. Draw the frequency spectrum for above AM wave showing all values. **10**

c) What is SSB transmission technique. Explain balanced modulator required for suppression of carrier in SSB. **10**

UNIT - III

3. a) Explain pre-emphasis and De-emphasis in detail. **10**

   b) Explain the basic reactance modulator for FM generation. **10**

   c) i) FM wave represented by voltage equation

   $V = 12\sin(6\times10^{8}t + 5\sin1250t)$

   Find modulating and carrier frequency, modulation index and deviation. **5**

   ii) Compare AM and FM. **5**

UNIT - IV

4. a) Explain with block diagram FM superheterodyne receiver. **10**

   b) Explain balanced slope detector ? Give its drawbacks. **10**

   c) i) What is image frequency and its rejection. **5**

   ii) In a broadcast receiver having no RF amplifier, the loaded Q of the antenna coupling circuit is 80. If the intermediate frequency is 455 kHz. Calculate the image frequency and its rejection ratio at 1000 kHz. **5**

UNIT - V

5. a) Explain following terms in context with skywave propagation. **10**

   i) Virtual height ii) Critical frequency

   iii) MUF iv) Skip distance and

   v) Fading

   b) Explain fibre optic cables and give its advantages. **10**

   c) Explain multiplexing, compare TDM and FDM. **10**

****