This question paper contains 2 printed pages. **Your Roll No. .....**

Sl. No. of Ques. Paper : **1902** **GC-3**
Unique Paper Code : **42514305**
Name of Paper : **Communication Electronics**
Name of Course : **B.Sc. Physical Science (CBCS)**
Semester : **III**
Duration : **3 hours**
Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any five questions. All questions carry equal marks.
Assume data wherever necessary.

1. (a) A single tone modulating signal cos ($15\pi\ 10^3 t$) frequency modulates a carrier of 10 MHz and produces a frequency deviation of 75 kHz. Find (i) the modulation index, (ii) phase deviation. (iii) If another modulating signal produces a modulation index of 100 while maintaining the same deviation, find frequency and amplitude of the modulating signal, assuming K_f= 15 kHz per volt. 7
   (b) What is analog and digital signal? Give two examples of each. 4
   (c) Make a block diagram of analog communication system. 4

2. (a) Describe balanced modulator. 9
   (b) Explain the functioning of slope detector. 6

3. (a) Derive the expression of a single tone AM wave. Draw baseband signal, carrier signal, modulated wave and frequency spectrum. Define modulation index. 9
   (b) Find the ratio of useful power to total power in AM wave. 6

4. (a) What are the advantages and disadvantages of geostationary satellite? Draw the satellite system downlink block diagram. 4,5
   (b) Make a comparison between PAM, PPM and PWM. 6

5. (a) Explain Time Division Multiplexing system. 7
   (b) Describe Super-heterodyne receiver using a block diagram and explain the function of each block. How is it superior to TRF? 8

6. (a) State Sampling theorem. Make all necessary spectrums to explain Nyquist criteria. 8
   (b) How can PAM be generated and detected? 7

7. (a) Describe Frequency reuse. Why is it useful in cellular telephone system? 5
   (b) Explain one method of generation of FM wave. 10

P.T.O.

8. Attempt any *three*:

(a) PCM and Quantization

(b) ASK and FSK

(c) SIM and IMEI Number

(d) Types of Noises and Significance of S/N ratio

(e) CDMA and FDMA

5×3