

**Important : Students are informed to Submit Answer Book as Continuous Single PDF File with File name “U19CSXXX\_DCOM END SEM ANSWER BOOK” (i) through Google Form Link given herewith in post section with information and (ii) through email to [kanirkarsir.dcomsubject@gmail.com](mailto:kanirkarsir.dcomsubject@gmail.com) (It is compulsory to submit BOTH ways through Google Form & above email id). PDF file in sequential pages with your admission number at top of each page will only be accepted. PDF Submitted up to 05:30 pm will be considered for evaluation and late submitted PDF will be treated as an intentional delay, so such candidate will be considered “ABSENT” during above exam.**

**Instructions :**

1. Time For Critical Thinking Subjective Exam is **01HOUR & 30MINUTES**
2. Time For Critical Thinking Subjective Paper Writing : **03:15 PM TO 4:45 PM**
3. Time For PDF Scanning & Submission : **04:45 PM TO 05:30 PM.**
4. Enter your Admission Number, Division, Name & Microsoft Teams email id in Google Form.
5. Submit Before 05:30 PM To Avoid Problems. Something is better than Nothing.

**S.V. NATIONAL INSTITUTE OF TECHNOLOGY, SURAT-395007.**  
**ELECTRONICS ENGINEERING DEPARTMENT**

**B.Tech II (COMPUTER) (3<sup>rd</sup> Semester) – (DIV. A & B)**  
**SUBJECT : DIGITAL COMMUNICATION (EC209)**  
**END SEM EXAM : (DEC-2020)**

**Total Marks: 30]**

**[Time : 1 Hour 30 Minutes**

- Instructions :** 1) Attempt all questions as per the instructions & in required steps.  
2) Figure to the right indicates full marks.

No.	Question. (Attempt all & as per the instructions & in all required steps)	Marks
Q-1	Analyse with neat & clean block diagram having notation and explain working of transmitter and receiver consists of two separate balanced modulators, which are supplied with two carrier waves of the same frequency but differing in phase by $90^\circ$ .	(05)
Q-2	Draw neat & clean precise Transmitter & Receiver block diagram of single bit per sample digital modulation techniques and waveform with mathematical expression and full working.	(05)
Q-3	How PCM control the effect of Noise and Distortion when the PCM wave travels on the channel. Draw neat & clean precise block diagram of such processes and all side waveforms with detailed explanation.	(04)
Q-4	Make a table for performance comparison of Ideal Sampling, Natural Sampling & Flat Top Sampling comparing & showing their (i) Generation Circuit, (ii) Waveform involved, (iii) Sampling principle, (iv) Sampling rate. Be clear & Precise.	(04)
Q-5	A modulating signal $10\sin(2\pi \times 10^3 t)$ is used to modulate a carrier signal $20\sin(2\pi \times 10^4 t)$ . Determine the (i) percentage modulation (ii) frequencies of the sideband components (iii) amplitudes of sidebands (iii) bandwidth of the modulated signal.	(04)
Q-6	A sinusoidal carrier has amplitude of 10V and frequency 30KHz. It is amplitude modulated by a sinusoidal voltage of amplitude 3V and frequency 1KHz. Modulated voltage is developed across $50\Omega$ resistance. (i) Determine modulation index (ii) Write the equation for modulated wave. (iii) Plot the modulated wave showing maxima and minima of waveform with all values (iv) Draw the spectrum of modulated wave with amplitude of each sideband & frequency.	(04)
Q-7	A 20MHz carrier is modulated by a 400Hz modulating signal. The carrier voltage is 5V and the maximum deviation is 10KHz. Write down the mathematical expressions for the FM and PM waves. If the modulating frequency is increased to 2KHz keeping everything else constant, write down the expressions for the FM and PM waves.	(04)

Note : All data given in numerical are correct.

\*\*\*\*\*