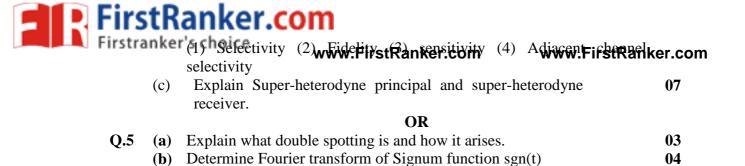# GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– V (New) EXAMINATION – WINTER 2019

Subject Code: 2151004   **Date: 06/12/2019**

Subject Name: Electronic and Communication

Time: 10:30 AM TO 01:00 PM   **Total Marks: 70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain the skin effect in brief.	**03**
	(b)	Draw basic diagram of communication system and explain in brief.	**04**
	(c)	What is modulation? Why modulation required? Describe in detail.	**07**
Q.2	**(a)**	Define the following term (i) Signal Bandwidth (ii) Power spectral density (iii) Distortion	**03**
	(b)	A series tuned circuit has a Q of 130 and a tuning capacitance of 250pF and is resonant at 450 kHz. Determine (i) the impedance at resonance, and (ii) the relative response of circuit at a frequency of 400 kHz.	**04**
	(c)	Draw and explain circuit of envelope detector for AM	**07**
		OR	
	(c)	Explain Double-sideband suppressed carrier (DSBSC) modulation with mathematical analysis.	**07**
Q.3	**(a)**	State and prove time shifting property of Fourier transform	**03**
	(b)	Determine the power content of the carrier and each of the sidebands for and AM signal having a percentage modulation of 80 % and total power of 2500 W	**04**
	(c)	Explain Carson's rule in FM? Explain Armstrong method of FM generation.	**07**
		OR	
Q.3	**(a)**	Describe briefly shot noise, partition noise and flicker noise. Why they are generated?	**03**
	(b)	Explain the importance of pre-emphasis and de-emphasis circuits.	**04**
	(c)	List all the basic FM demodulators. Draw and explain Foster Seeley Discriminator in detail	**07**
Q.4	**(a)**	Give comparison between AM and FM systems.	**03**
	(b)	Explain the thermal noise in brief.	**04**
	(c)	Define noise factor and noise temperature. Derive the Friss's formulae for noise factor when amplifiers are in cascade connection.	**07**
		OR	
Q.4	**(a)**	With related to Amplitude modulation discuss following parameters: (I) Bandwidth requirement (II) Power distribution in sidebands and carrier.	**03**
	(b)	Explain the delayed AGC with diagram.	**04**
	(c)	A FM voltage is represented by $v=12\sin(6 \times 10^8 t + 5\cos 1250t)$ .Find Carrier Frequency, Modulating Frequency, Modulation Index, Maximum Deviation	**07**
Q.5	**(a)**	List main function of radio receiver.	**03**
	(b)	Define the following terms related to radio receiver :	**04**

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(1) Selectivity (2) Fidelity (3) sensitivity (4) Adjacent-channel selectivity

(c)	Explain Super-heterodyne principal and super-heterodyne receiver.		**07**

OR

Q.5	(a)	Explain what double spotting is and how it arises.	**03**
	(b)	Determine Fourier transform of Signum function sgn(t)	**04**
	(c)	What is Ham radio? Discuss the importance of Ham radio during natural calamines.	**07**

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