(3)

BE SEM VIII (choice based) Summer 2026 EXTC

Time: 3 Hours

Maximum Marks: 80

14/5/26

NB. 1. Question number one is compulsory
2. Attempt any three out of remaining five questions
3. Assume suitable data wherever required
4. Figures to the right indicate the maximum marks

Q1: Attempt any four

i) Draw and Compare Maximally flat low pass prototype and Equal ripple low pass prototype, in filter design. **(5)**

ii) Why is value of m=0.6 in matching section of filter in design by image parameter method. **(5)**

iii) Explain 1 dB compression in power amplifier designing **(5)**

iv) Give the characteristics of mixers. **(5)**

v) What are various types of gains defined in RF Amplifiers? **(5)**

Q2: A) Give the significance of each section in Image parameter method of filter design. **(10)**

B) Derive the expression for available power gain G_A. **(10)**

Q.3 A) Silicon bipolar junction transistor has the following scattering parameters at 1 GHz $S_{11} = 0.38 \angle -1580^0$, $S_{12} = 0.11 \angle 54^0$, $S_{21} = 3.5 \angle 80^0$, $S_{22} = 0.40 \angle -43^0$. The source impedance $Z_s = 25\Omega$ and load impedance $Z_L = 40\Omega$. Compute the Power gain, the overall power gain and transducer power gain. **(10)**

B) Compare various types of Diode and FET Mixers **(10)**

Q4: A) Explain various coupling modes in EMI **(10)**

B) Explain Bonding and Shielding in EMC **(10)**

Q5 A) Show that reflection coefficient is larger than 1 for negative load resistance. Why negative resistance is important in oscillator design. **(10)**

B) Discuss, in detail, the role of ANSI standards in EMI/EMC area. **(10)**

Q6: A) Short note on microwave filter implementation **(10)**

B) Write short note on Richard's Transformation **(10)**
