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MEVD-302(A)

M.E./M.Tech. III Semester

Examination, December 2017

Communication RF IC Design

(Elective-IV)

Time : Three Hours

Maximum Marks : 70

Note : i) Attempt any five questions only.
ii) Every question contains equal marks i.e. (14).
iii) Assume necessary suitable data.

1. a) The current flowing in microstrip line assumed to be infinite and lossless is specified to be $i(t)=0.6\cos(9\times10^9t-500z)$A. Find the following:
   i) Phase velocity
   ii) Frequency
   iii) Wavelength
   iv) Phasor expression for the current
   b) A lossless transmission line is 10cm long ($Z_0=50\Omega$, f=800MHz, $v_p=0.77c$). If the input impedance is $Z_{in}=j60\Omega$. Find following:
   i) Z_L using smith chart
   ii) What length of short circuit transmission line would be needed to replace Z_L?

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2. a) Describe Hartley image-reject receiver architecture.
   b) Derive the formula of image reject ratio for Hartley receiver.

3. a) Explain CDMA communication standard.
   b) Explain the effect of interference in CDMA.

4. a) Derive the equation for LNA gain.
   b) Explain the effect of noise on CMOS mixer.

5. a) What are the RFIC design concepts for device? Explain any three types of devices.
   b) Explain the role of LNA in receiver circuit with suitable block diagram.

6. Design trans-receiver circuit of RF communication. Specify the frequency bands.

7. a) Explain the working of PLL with a suitable diagram.
   b) Explain microwave circuit with a suitable diagram.

8. Explain case study of GSM.

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