

University of Mumbai
Examination June 2021

Examinations Commencing from 1st June 2021

Program: **BE EXTC**

Curriculum Scheme: Rev2016 Examination: BE Semester VIII

Course Code: ECC 801 and Course Name: RF DESIGN

Time: 2 hour

Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	A frequency synthesizer is defined as a device that
Option A:	Generates a single precise frequency from a large number of reference frequencies
Option B:	Generates a large number of precise frequencies from a single reference frequency
Option C:	Generates a large number of reference frequencies from a single precise frequency
Option D:	Generates a single reference frequency from a large number of reference frequencies
2.	The disadvantages associated with direct frequency synthesis are greatly diminished with the frequency synthesis technique that employs a
Option A:	Crystal resonator
Option B:	Phase Locked Loop
Option C:	Oscillator
Option D:	Band Pass Filter
3.	Which of the following is a part of Direct Frequency Synthesis?
Option A:	Oscillators
Option B:	Mixers
Option C:	Band pass filters
Option D:	All of the above
4.	The effects of EMI can be reduced by
Option A:	Suppressing emissions
Option B:	Reducing the efficiency of the coupling path
Option C:	Reducing Reducing the susceptibility of the receptor
Option D:	All of these
5.	Any electrical signal present in a circuit other than the desired signal is known as
Option A:	Noise
Option B:	Distortion
Option C:	Interference

Option D:	All of these
6.	The victim device affected by EMI is called as the
Option A:	Susceptor
Option B:	Emitter
Option C:	Absorber
Option D:	Transmitter
7.	In EMC signal, the source delivers maximum power to the input of transmission line when the transmission line input impedance
Option A:	Greater than the source resistance
Option B:	Smaller than the source resistance
Option C:	Is equal to the source resistance
Option D:	None of these
8.	The opposite of susceptibility is
Option A:	Immunity
Option B:	Emission
Option C:	Interference
Option D:	Electromagnetic compatibility
9.	The ability of an electronic system to function properly in its intended electromagnetic environment and should not be a source of pollution to that electromagnetic environment is known as
Option A:	Susceptibility
Option B:	Emission
Option C:	Electromagnetic Interference
Option D:	Electromagnetic Compatibility
10.	The following approaches can be used to combat EMI and hence achieve EMC
Option A:	Grounding
Option B:	Shielding
Option C:	Bonding
Option D:	All of the above
11.	If the length of elements of an array is greater than $\lambda/2$, which will be the operating region of an array?
Option A:	Transmission line region
Option B:	Active region
Option C:	Reflective region
Option D:	Refractive region
12.	Parasitic element that is typically about 5 percent longer than the half-wave dipole-driven element is called
Option A:	Array element
Option B:	Director element

Option C:	Reflector element
Option D:	Driven element
13.	Parabolic reflector antenna performs which of the following conversion mechanism?
Option A:	Plane to spherical wave
Option B:	Spherical to plane wave
Option C:	Plane to Elliptical wave
Option D:	Spherical to Elliptical wave
14.	The ratio of the focal length to the diameter of the mouth of the parabola is called
Option A:	aperture
Option B:	focal point
Option C:	foci
Option D:	major axis
15.	Using a small reflector to beam waves to the larger parabolic reflector is known as
Option A:	Focal feed
Option B:	Horn feed
Option C:	Cassegrain feed
Option D:	Coax feed
16.	At 20 GHz, the gain of a parabolic dish antenna of diameter 1 metre and 70 % efficiency is around
Option A:	15 dB
Option B:	25 dB
Option C:	35 dB
Option D:	45 dB
17.	The widely used shape for patch antennas is
Option A:	Rectangular
Option B:	Circular
Option C:	Elliptical
Option D:	Parabolic
18.	Compared to conventional microstrip antenna compact microstrip antenna has
Option A:	Lower gain
Option B:	Higher Bandwidth
Option C:	Higher gain
Option D:	Lower input impedance
19.	What will be the length of RMSA for Wi-Fi application (2.400 to 2.483 GHz)? Chose Substrate: $\epsilon_r = 2.32$, $h = 0.16$ cm and $\tan \delta = 0.001$
Option A:	4.7cm
Option B:	3.9cm

Option C:	5.7cm
Option D:	6.7cm
20.	Which antennas are renowned as patch antennas especially adopted for space craft applications?
Option A:	Aperture
Option B:	Microstrip
Option C:	Array
Option D:	Lens

Q2	
A	Solve any Two 5 marks each
i.	What are the natural and nuclear sources of EMI?
ii.	Define EMI and EMC
iii.	Why is EMI a vital problem? Define LISM.
B	Solve any One 10 marks each
i.	What are the factors influencing the EMI performance of the bonding? How can bonding be made?
ii.	Explain different types of sources of EMI in detail. Give example

Q.3	
A	Solve any Two 5 marks each
i.	Define transducer power gain.
ii.	Define operating power gain
iii.	Define available power gain
B	Solve any One 10 marks each
i.	What are the factors influencing the EMI performance of the bonding? How can bonding be made?
ii.	Explain different types of sources of EMI in detail. Give example