University of Mumbai

Examination Second Half 2021 under cluster __(Lead College: _____)

Examinations Commencing from 22nd November2021 to5thJanuary 2022

Program: Computer Engineering

Curriculum Scheme: Rev 2016

Examination: SE Semester III

Course Code: CSC304 and Course Name: Electronic Circuits and Communication Fundamentals

Time: 2hour 30 minutes Max. Marks: 80

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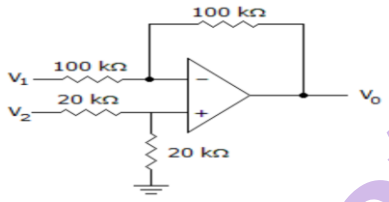
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	In a transistor, current relationship is given as
Option A:	$I_C = I_E + I_B$
Option B:	$I_B = I_C + I_E$
Option C:	$I_E = I_C - I_B$
Option D:	$I_E = I_C + I_B$
2.	The most commonly used semiconductor in the manufacture of a transistor is …….
Option A:	Germanium
Option B:	Silicon
Option C:	Carbon
Option D:	Nitrogen
3.	In an LC oscillator, the frequency of oscillator is ……. L or C.
Option A:	Proportional to square of
Option B:	Directly proportional to
Option C:	Independent of the values of
Option D:	Inversely proportional to square root of
4.	Mathematically, the number of sidebands in frequency modulated system is
Option A:	Infinite
Option B:	One
Option C:	Two
Option D:	Zero
5.	In superheterodyne receiver , the input at mixer stage is
Option A:	IF and RF
Option B:	RF and AF
Option C:	IF and AF
Option D:	RF and local oscillator signal
6.	The IF is 455Khz. If the radio receiver is tuned to 855Khz, the local oscillator frequency is
Option A:	455Khz
Option B:	1310Khz
Option C:	1500Khz
Option D:	1520Khz

7.	Which of the following is the process of 'aliasing'?
Option A:	Peaks overlapping
Option B:	Phase overlapping
Option C:	Amplitude overlapping
Option D:	Spectral overlapping
8.	Calculate the minimum sampling rate to avoid aliasing when a continuous time signal is given by x(t) = 5 cos 400πt
Option A:	100
Option B:	200
Option C:	400
Option D:	250
9.	When two or more signals share a common channel, it is called
Option A:	Multiplexing
Option B:	Channeling
Option C:	Switching
Option D:	Sub-channeling
10.	Determine the output voltage when v1=v2=1V 
Option A:	0V
Option B:	-2V
Option C:	1V
Option D:	2V

Q2 (20 Marks)	**Solve any Four out of Six 5 marks each**
A	What is the source of leakage current in a transistor?
B	How DSBSC is produced with the help of balanced modulator?
C	What is sampling theorem? What happens if sampling is done at fs < 2 fmax?
D	Compare various pulse modulation techniques.
E	Write a short note on Op-amp as Comparator.
F	Define the terms- Information theory, Informationrate and Entropy.
Q3 (20 Marks)	**Solve any Two Questions out of Three 10 marks each**
A	Give each component of Analog Communication System in detail.
B	What do you mean by Multiplexing? Explain TDM.
C	Explain with neat diagram, the working of Colpitts Oscillator.
Q4 (20 Marks)	**Solve any Two Questions out of Three 10 marks each**
A	Discuss the principle of operation of super heterodyne receiver in detail along with waveforms at each stage.
B	Explain the following parameters for Op-amp 741: CMRR, Slew Rate,

	Gain bandwidth product, Input Offset Voltage and Output Resistance .
C	What are different regions of characteristics of Bipolar Junction Transistor? Explain in detail.