American International University- Bangladesh (AIUB)
Faculty of Engineering

Course Name:	Data Communication	**Course Code:**	COE 3201
Semester:	Fall 2022	**Term:**	Final
Total Marks:	30	**Submission Date:**	06-12-2022
Faculty Name:	Dr. Shuvra Mondal	**Assignment:**	02/OBE

Course Outcome Mapping with Questions

Item	COs	POIs	K	P	A	Marks	Obtained Marks
Q1	**CO5**	**P.f.2.C6**	**K7**	**P1, P3, P7**		**30**	
					Total:	**30**	

Student Information:

Student Name: Emon Singha	**Student ID: 20-42344-1**
Section: K	**Department: Bsc CSE**

Marking Rubrics (to be filled by Faculty):

Problem	Excellent [5]	Proficient [4]	Good [3]	Acceptable [2]	Unacceptable [1]	No Response [0]	Secured Marks
	Detailed unique response explaining the concept properly and answer is correct with all works clearly shown.	Response with no apparent errors and the answer is correct, but explanation is not adequate/unique.	Response shows understanding of the problem, but the final answer may not be correct	Partial problem is solved; response indicates part of the problem was not understood clearly.	Unable to clarify the understanding of the problem and method of the problem solving was not correct	No Response/(Copied/identical submissions will be graded as 0 for all parties concerned)	
1							
Comment						Total marks (30)	

Use your ID (ID = AB-CDEFG-H)

1. A voice channel occupies a bandwidth of **BCE** **kHz**. Ten voice channels are multiplexed together using FDM (Frequency Division Multiplexing) with guard bands of **DG** **Hz**.

(a) Compose the required **Bandwidth**.

(b) Construct the configuration of multiplexing and demultiplexing process as an illustration using the above voice channels, bandwidth and the guard bands with proper labeling (choose carrier frequency range of your preference according to the Bandwidth).

(a)

ID = AB - CDEFG - H

My ID = 20 - 42344 - 1

Bandwidth = BCE = 043 KHz

$= 43 \times 10^3$ Hz

Guard bands = DG = 24 Hz

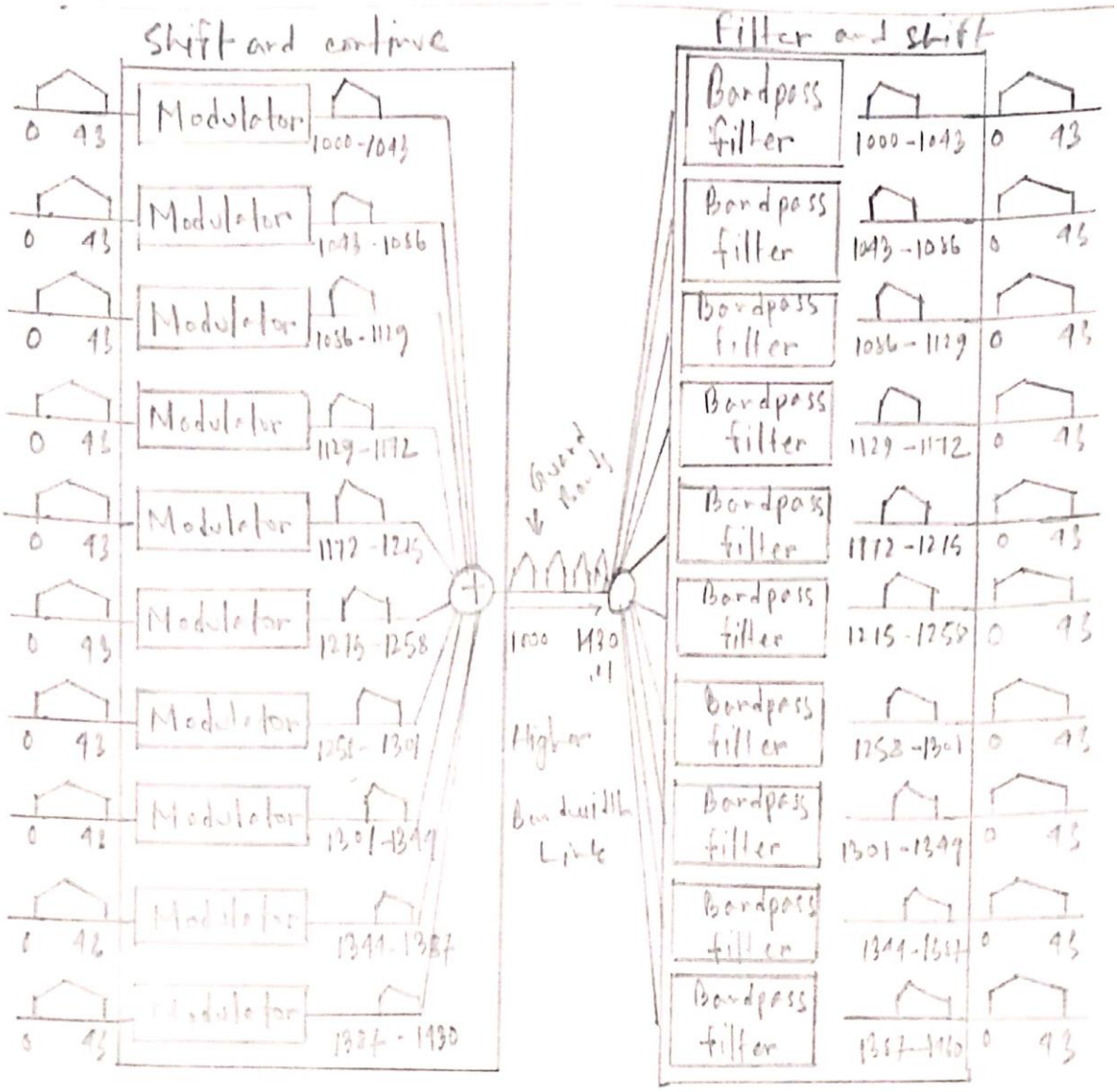
Required Bandwidth = $(10 \times 43 \times 10^3 + 9 \times 24)$ Hz

$= (430000 + 216)$ Hz

$= 430216$ Hz

$= 430.216$ Hz

(b) Constructing the configuration of multiplexing and demultiplexing process as an illustration using the above voice channels with the frequency range from 1000 KHz to 1430.216 KHz.


Shift and combine
Modulator
0 43
1000-1043
1043-1086
1086-1129
1129-1172
1172-1215
1215-1258
1258-1301
1301-1344
1344-1387
1387-1430
Guard bands
1000 1430
Higher
Bandwidth
Like
Filter and shift
Bandpass filter
1000-1043
1043-1086
1086-1129
1129-1172
1172-1215
1215-1258
1258-1301
1301-1344
1344-1387
1387-1430
0 43