Code No. : 14164 AS (C)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A+-- Grade

B.E. IV-Semester Advanced Supplementary Examinations, Aug./Sept.-2023
Introduction to Communications Systems (OE-II)

Time: **3 hours**

Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Define gain and attenuation.	2	1	1	1
2.	Write frequency range of voice, Audio and video signals.	2	1	1	1
3.	What is the practical bandwidth of wide band FM for modulation index $\beta=75$ and message signal frequency of 1KHz.	2	2	2	1
4.	State the disadvantages of Tuned radio frequency receiver.	2	1	3	1
5.	A video signal contains light variations that change at a frequency as high as 4MHz. Determine the minimum sampling frequency for analog to digital conversion.	2	3	4	1
6.	Mention applications of serial and parallel transmission of data.	2	2	4	1
7.	Define transmission efficiency.	2	1	5	1
8.	A 7-bit ASCII code is transmitted serially in 140ns. Calculate the speed of transmission in bits per second.	2	2	4	1
9.	Write applications of microwaves.	2	2	6	1
10.	State the lowest wavelength and highest wavelength of visible light, and mention the color of each.	2	3	6	1

Part-B (5×8 = 40 Marks)

11. a)	Derive an expression of Amplitude Modulated (AM) signal for message signal , $m(t) = A_m Cos(\omega_m t)$ and carrier signal $c(t) = A_c Cos(\omega_c t)$.	4	3	2	1
b)	Classify electromagnetic spectrum based on frequency range and write applications of each frequency band.	4	1	1	2
12. a)	Draw the block diagram of superheterodyne receiver and explain its working with an example.	4	2	3	1
b)	A 200MHz frequency modulated carrier deviated by 15kHz by a 1KHz modulating signal. Sketch the frequency spectrum and calculate the bandwidth.	4	3	3	2

			M	L	CO	PO
13.	a)	Describe the advantages of using digital techniques in communication.	4	1	4	1
	b)	Classify pulse modulation techniques and compare them with respect to signal to noise ratio and bandwidth.	4	3	4	1
14.	a)	Explain the process of Error Detection and Error Correction?	4	2	5	2
	b)	Describe the transmission of data over telephone wires using FSK MODEM.	4	2	5	1
15.	a)	Compare Bluetooth and Wi-Fi technologies.	4	3	6	1
	b)	Explain the block diagram of transmitter and receiver of optical communication system.	4	2	6	1
16.	a)	Explain the need for Modulation in Communication System?	4	2	1	1
	b)	Compare amplitude and frequency modulation techniques.	4	3	2	1
17.		Answer any *two* of the following:	4			
	a)	Distinguish between time division multiplexing and frequency division multiplexing.	4	3	4	1
	b)	Determine the Hamming bits for the 8-bit data to be transmitted is '00110110'.	4	3	5	1
	c)	Write the advantages and disadvantages of microwave communication.	4	2	6	1

M : Marks;   L: Bloom's Taxonomy Level;   CO; Course Outcome;   PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%

*****