PRN No.

PAPER CODE

U313-291 ES

December 2023 (ENDSEM) EXAM

TY (SEMESTER - I)

Branch: Electronics and

COURSE CODE: ES31201ET

Design and Analysis of Algorithms

COURSE NAME:

Telecommunication

(PATTERN 2020)

Time: [1Hr. 30 Min]

[Max. Marks: 40]

- (*) Instructions to candidates:
- 1) Figures to the right indicate full marks.
- 2) Use of scientific calculator is allowed
- 3) Use suitable data wherever required
- 4) All questions are compulsory. Solve any one sub question from Question 3 and any two sub questions each from Questions 4,5 and 6 respectively.

Q. No.	Question Description		-	
		Max.	CO	В
01		Marks	mapped	T Level
Q.1	a) Apply master theorem to binary search algorithm and	[2]	1	Apply
	determine the time complexity.	• •		1.151.13
Q2	a)An array [2, 5, 3, 1, 8] is to be sorted in ascending order	[2]	2	A 44 m 1 = 1
	using heap sort algorithm. Illustrate the construction of heap	[4]	4	Apply
	and sorting procedure after each step.			
Q3.	a)A networking company uses a Huffman coding technique to	[6]	3	
:	encode the message before transmitting over the network	ίοì	3	Apply
	The message contains following characters with their		[:	
	frequency.			
	(a: 5), (b: 9), (c: 12), (d: 13), (e: 16), (f: 45)	,		
,	Determine the total number of bits of the encoded message.			
	incobage,			
	b) Construct the minimum spanning tree (MST) for the given	[6]	3	A 1
	graph using Prim's Algorithm, starting from node 1. Hence	ίοὶ	3	Apply
	determine the minimum cost of the tree. State the time			}
.	complexity of the algorithm.			ļ.
ļ	28			ļ I
	10 14 16			
	24 18			
	25 12			
1	(4)			
2.4	22			
-	a) i) In ICC World Cup tournament, 10 countries are playing.	[5]	4	Apply
	In league matches, each country has to play with every other			
	country in order qualify for semifinals. Determine the number			
	of league matches played using binomial expansion formula.	Ì		

Using these denominations, how many number of ways can Ram generate a sum of 30. Also write all the combinations. b)A vegetable seller has to fetch the vegetables to the market in a sack with maximum capacity of 8 Kg. There are following items with their weights and profits. Items 1 2 3 4		ii)Ram has infinite coins of denominations 5, 10 and 20.	т		
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