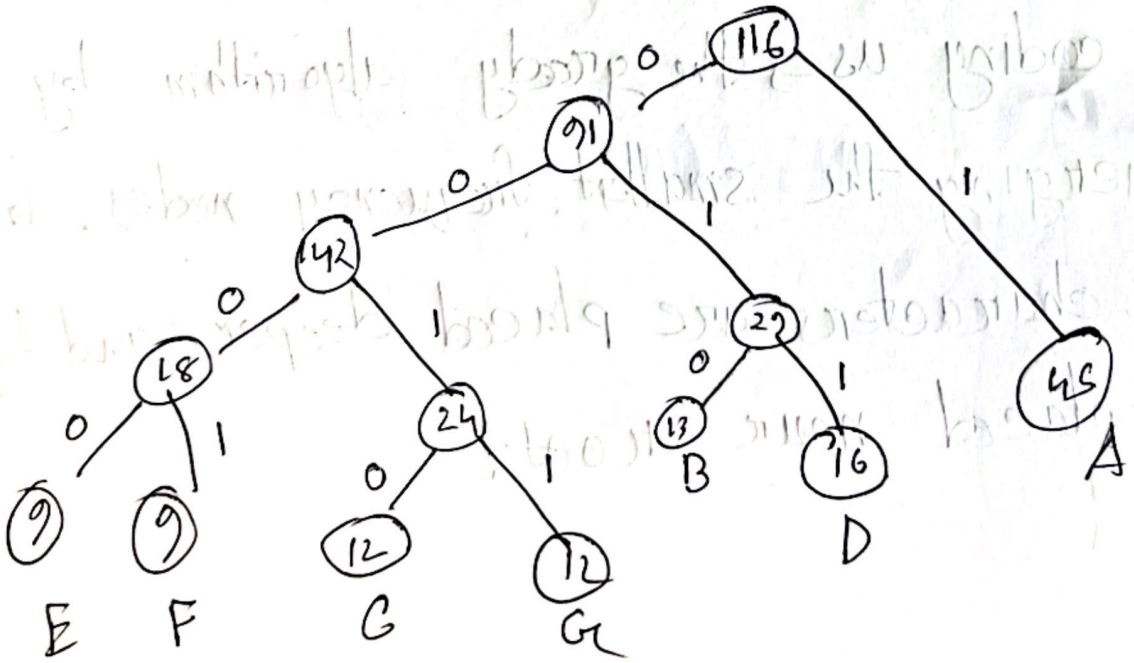
Ans 1

Chan	Freq	code	
A	45	1	1 × 45 = 45
B	13	0 1 0	3 × 13 = 39
C	12	0 0 1 0	4 × 12 = 48
D	16	0 1 1	3 × 16 = 48
E	9	0 0 0 0	4 × 9 = 36
F	9	0 0 0 1	4 × 9 = 36
G	12	0 0 1 1	4 × 12 = 48
	Σ = 116		Σ 300 bits

3 bit encoding · (116 × 3) = 348 bits



∴ space saved (348-300) = 48 bits

ans 1.

Ans: b

code for each character

A = 1

B = 010

C = 0010

D = 011

E = 0000

F = 0001

G = 0011

Ans: C

Huff man coding uses the greedy algorithm by always merging the smallest frequency nodes. low frequency characters are placed deeper and hig ones are placed near root.

This approach ensures that the tree is built bottom up prioritizing the combination of the least frequency symbol.

Ans: D

Both of them will generate the same output and will generate same total length. Because huffman coding optimality depends only on frequency Among them the first friends approach is the best.

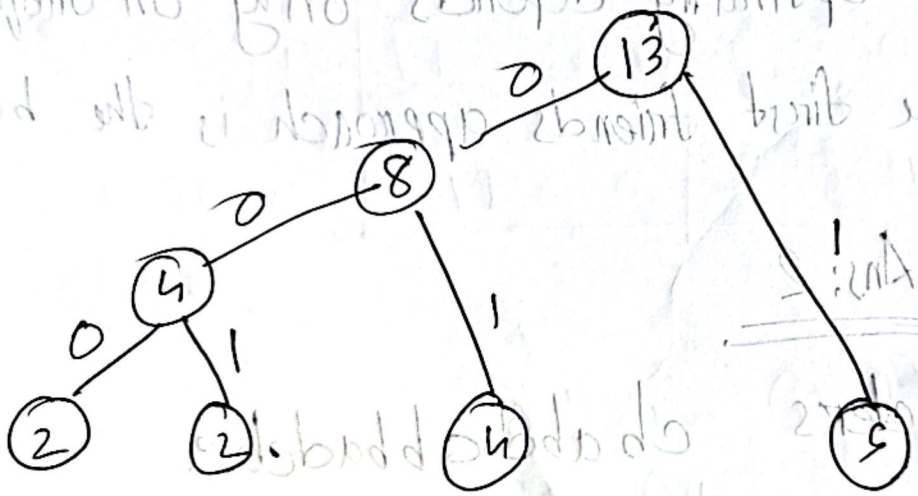
Ans: 2

Merged characters cb abd cbbadcbc

Character	Frequency
a	2
b	5
c	4
d	2
	13

Ans: 2 (ii)

char	freq	code	
a	2	000	3×2 = 6
b	5	1	1×5 = 5
c	4	01	2×4 = 8
d	2	001	3×2 = 6
			Σ = 25



Ans: 2 (iii)

a = 000

b = 1

c = 01

d = 001

ans: 2(iv)

Encoded msg: ç b ä á b d ć b b á d é b ć :

~~0 1 1 0 0 0 1 0 0 0 1 0 1 1 0 1~~

0 1 1 0 0 0 | 1 0 0 | 0 1 1 1 0 0 0 0 0 | 0 1 1 0 1

ans: 2(v)

For encoded msg = 25 bits

for characters = (4×8) = 32 bits

~~∴ code (32)~~

code : 9 bits.