Review Unit 3: Voting Methods & Fair Division

Aubrey, Ben, Charlie, Derek, and Emily are running for class president. Use the following preference schedules to determine the winner as indicated

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# of votes	20	22	12	9
First Choice	A	В	E	D
Second Choice	С	D	С	E
Third Choice	D	С	D	С
Fourth Choice	E	A	A	A
Fifth Choice	В	Е	В	В

ifth	Choice	В	E	В	В
1.	Determine the	winner using a 5-4-3-2	2-1 Borda count.		
	A; 186	C; 221	E=158	D with 22	9
	B: 151	D/ 229		and the second s	and the second
2.	Determine the	plurality winner.	with 22		
3.	Determine the	runoff winner.	vita 41		eliminated 3 ra
4.	Determine the	sequential runoff win	ner. 2 Celi	mirrated 1st A	eliminated 3m
5.	Determine the	Condorcet winner, if	there is one.	ininatu C	
	AVSC	A:20 C;43	(C)O C120+12	.=32	
6.	Suppose that the	A: 20 C: 43 C: $20 + 12 + 9 = 41$ his election is conducted	ed by the approval me	t = 3 and all the voter	s decide to approve
	A=20	choices on the prefer C = 20 + 22 + 12 + 12 + 12 + 12 + 12 + 12 +	7= 03 8=17	2+9=21 / Both	C+D)
7.	What was Arro	ow's contribution to el	ection theory?	D	the 5 conditions
5 5	500	nolitions To T	ocaoir areory.	- Printed 1 ot	the 5 conditions
0	Consider a situ	nolitions for fo	A Band Change 1 2	p will alw	cup be violated
	needed to pass	ation in which voters . an issue	A, B, and C have 1, 3	, and 2 votes respectiv	rely and 4 votes are
	needed to pass	aii 105 4C .			
	a. List all v	winning coalitions and	their vote totals.	Ph.	
	E A	-, B; 43 Ex	HBC; 63 21	BC;53	
	b. Find the	power index of each	voter.		
	A:	1 6:3	C:1		
		ve divided a cake into			
		one of the methods the			
		g portions so that each	870		-

Cach of 4 people cuts his/hers into 5 egnal pieces and the 5th person chooses I from lach person. 10. Sam and Madeline want to divide a cake so that Sam feels that she gets two-fifths of it and Madeline

feels that she gets three-fifths. How can this be done?

Modeline cuts into 5 equal pieces and Sam selects 2. (Chorser)

11. Anne, Dave, and Jay are heirs to an estate that includes a computer, a used car, a stereo, and \$6,000. The will states that Anne is to receive 25%, Dave receives 35%, and Jay receives 40%. Each heir has submitted bids for the items in the estate as summarized in the following table.

	Anne	Dave	Jay
Computer	\$1,800	\$1,500	\$1,650
Car	\$2,600	\$2,400	\$2,000
Stereo	\$1,000	\$800	\$1,200

Determine the properties that each person receives and the final amount of cash that he or she receives or pays.

	Anne	Dave	Jay
Total of Bids & Cash	11,400	10,700	10,850
Fair Share	2,850	3,745	4,340
Items Received	computer, cor		STORPO
Values of Items Received	4,400		1,200
Initial Cash Received	-1,550	3,145	3,140
Share of Remaining Cash	166.25	232.75	266
Final Settlement	owes 1,383.75	3,977.75	3,406

- 12. States A, B, C, and D have populations of 647, 247, 106, and 360 respectively. There are 85 seats to be apportioned among them.
 - a. What is the ideal ratio?
 - b. What is the tentative apportionment by the methods of Hamilton, Jefferson, Webster, Hill-Huntington? (Fill in the chart below).

Tentative Apportionment Final Apportionment Hill-Hamilton Jefferson Webster Hill-State Quota Hamilton Jefferson Webster Geometric Huntington Population Mean Huntington A 40 40 40.43 40 41 40 40 40 40.496 40 647 В 15 15 15,43 15 15.49 15 15 15 15 15 247 C 参 7 6 6.48 6 6.62 106 22* D 22* 23 23 23 22.49 13 23 23 22.5 360 Total 85 85 85 83 83 85 85 85 Seats Awarded

В: 15.4	c: \5.1	D: 15.6	
djusted Ratios for each state	e		
B:	C:	D:	
		djusted Ratios for each state.	djusted Ratios for each state.

f. State the final apportionment for each state in the table above.