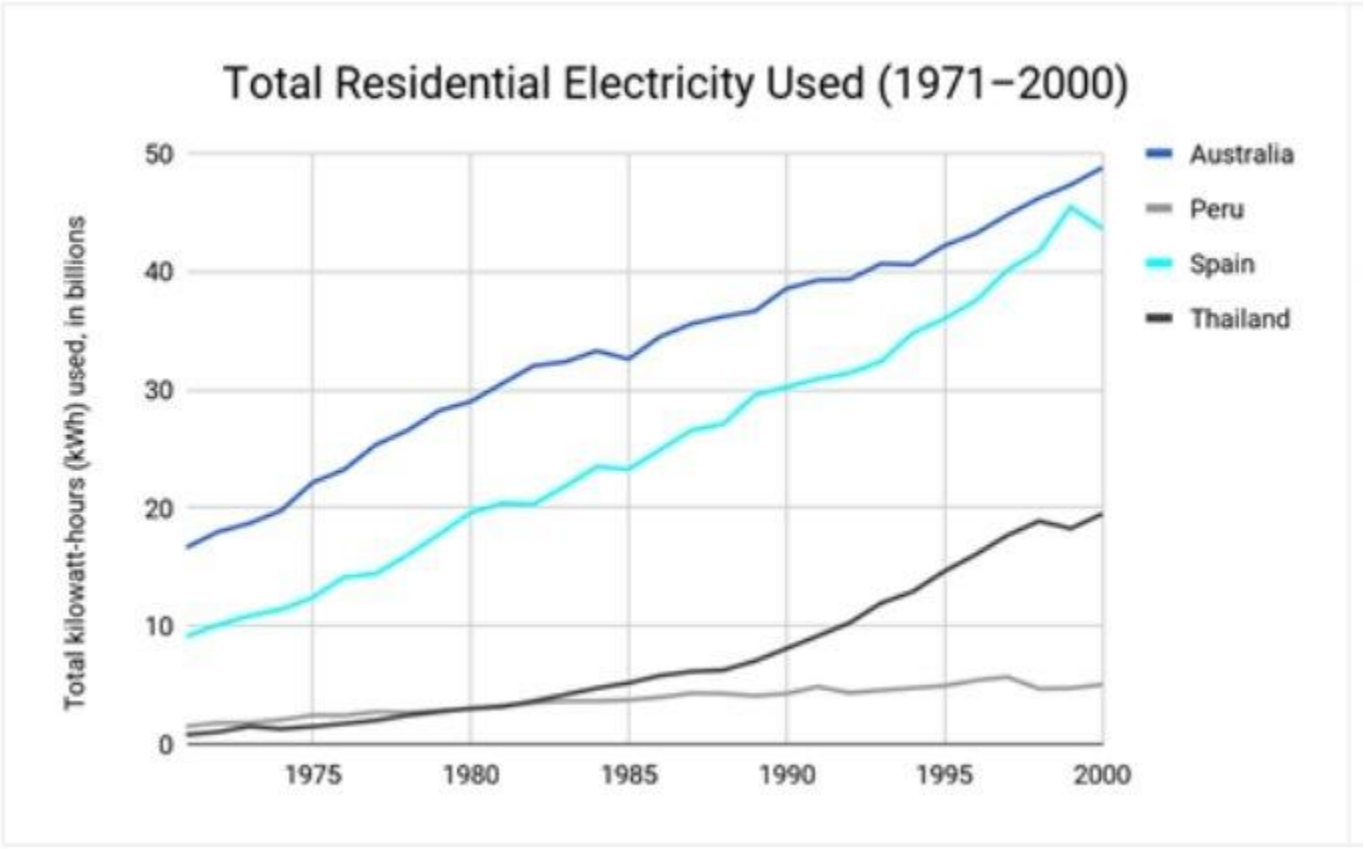
GMAT IR PRACTICE PAPER

GRAPHIC REPRESENTATION

1.

achment:



6.jpg [43.64 KiB | Viewed 442 times]

The graph indicates the total amount of residential electricity used in four countries, measured in kilowatt-hours. The numbers are presented in billions.

For each statement, select the option from the drop-down menu that completes the statement as accurately as possible according to the information provided.

The country listed with smallest standard deviation in residential energy used between 1971 and 2000 is_____.

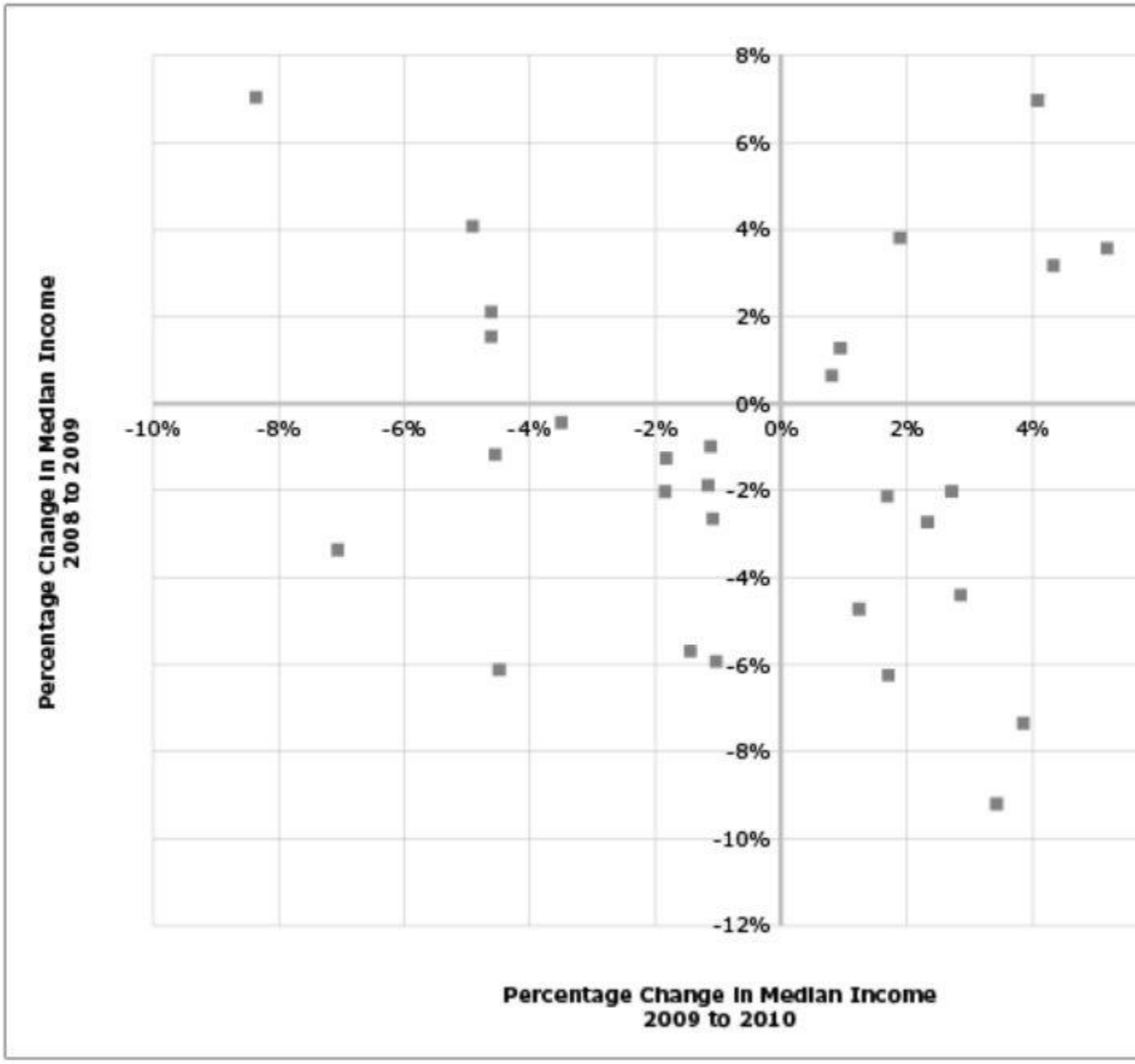
A. Australia

B. Peru
C. Spain
D. Thailand

The country with the largest percent increase in total kilowatt-hours used from 1985 to 1990 is_____.

A. Australia
B. Peru
C. Spain
D. Thailand

2.



16.jpg [60.04 KiB | Viewed 334 times]

The scatter plot shows the percentage change in median personal income for residents in 30 U.S. states from 2008 to 2009 and from 2009 to 2010. The y-axis represents the percentage change in median income from 2008 to 2009, and the x-axis represents the percentage change in median income from 2009 to 2010.

For each statement, select the option from the drop-down menu that completes the statement as accurately as possible according to the information provided.

If a state from the sample shown is chosen at random, the probability that the median income of that state's residents increased each year from 2008 to 2010 is closest to_____.

A.	0.12
B.	0.2
C.	0.33
D.	0.5
E.	0.63

Among the states represented in the scatter plot, the number that saw an increase in residents' median income from 2008 to 2009 is_____the number that saw an increase in residents' median income from 2009 to 2010.

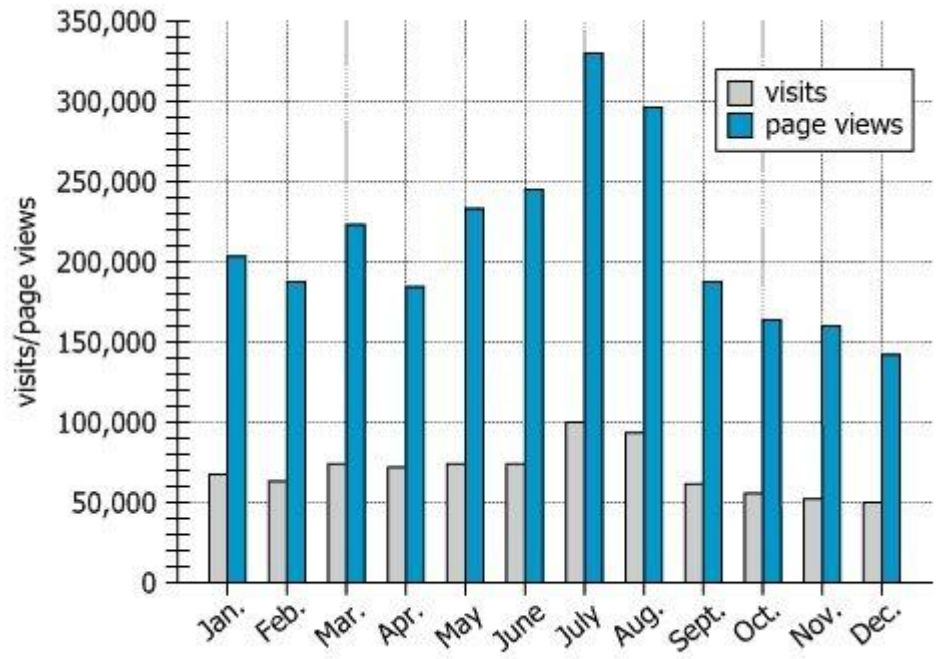
A.	Less	than
B.	Equal	to

C. Greater than

3.

The graph shows the number of visits and the number of page views a certain website received each month last year.

Attachment:



Use the drop-down menus to fill in the blanks in each of the following statements based on the information given by the graph.

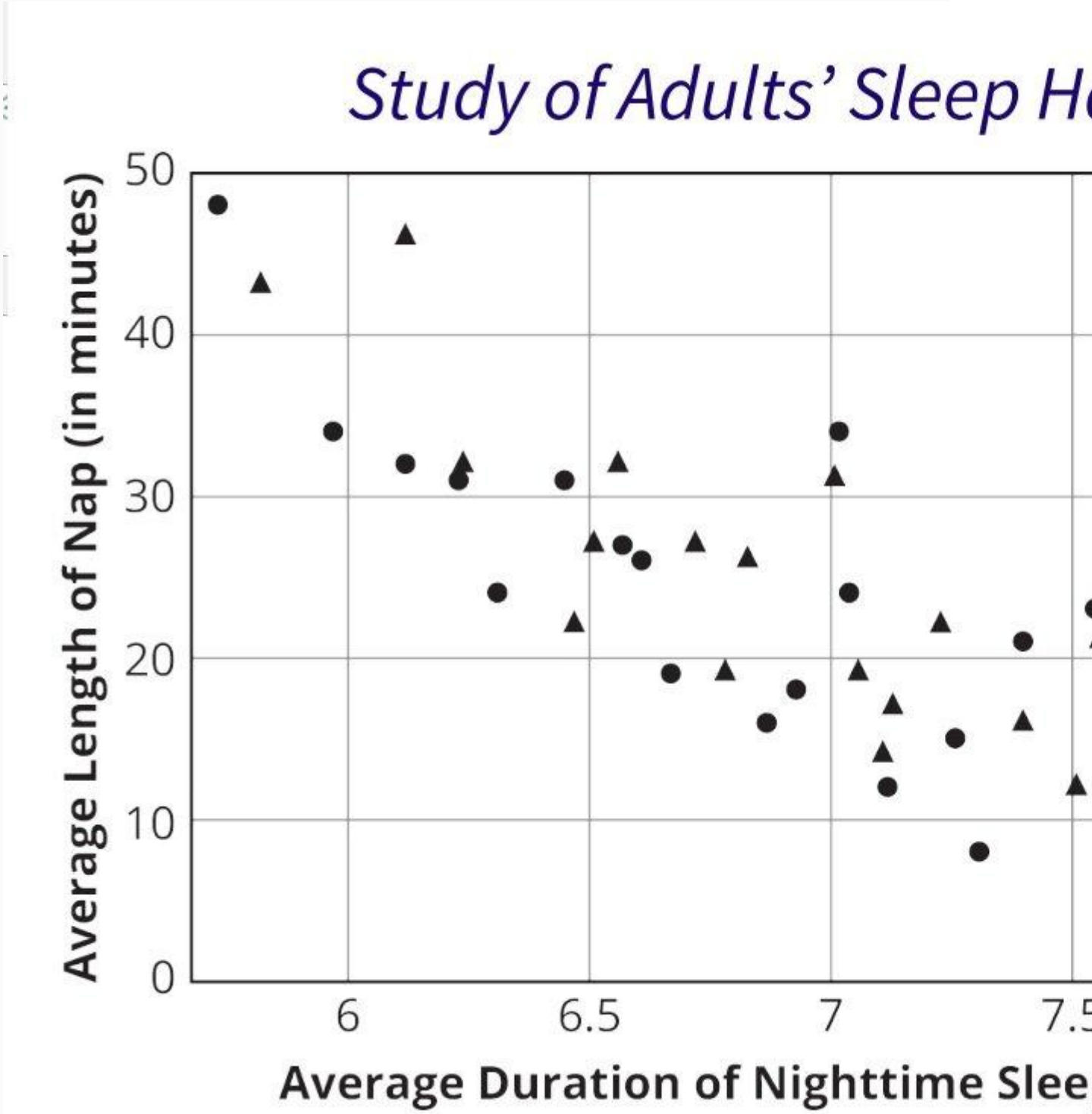
1. The month with the fewest visits per page view was_____

A. February
B. May
C. July
D. November

2. The median number of monthly page views was closest to_____

A. 50,000
B. 100,000
C. 200,000
D. 300,000

4.



1.jpg [94.76 KiB | Viewed 223 times]

As part of a study on the napping habits of adults, several scientists asked 40 individuals who nap frequently—20 men and 20 women—to record the duration of their naps for one month. These individuals were also asked to record the amount of sleep they get at night. For the purpose of the study, the accepted ideal nap length was set at 10 to 20 minutes per nap. This length has been shown to help combat fatigue and make one feel more alert. The chart above shows the average nap duration and average nighttime sleep length for each of the individuals.

For each statement, select the option from the drop-down menu that completes the statement as accurately as possible according to the information provided.

A. Of the women whose average nap length was in the accepted ideal range, the greatest number received an average of hours of nighttime sleep.

(A)	between	6	and	6.5
(B)	between	6.5	and	7
(C)	between	7	and	7.5
(D)	between	7.5	and	8

B. Of the men in the survey, of them napped, on average, for more than 30 minutes.

(A)	25%
(B)	30%
(C)	55%

(D) 60%

5.

The chart indicates the number of tornadoes recorded at a weather station in northern Indiana over a 30-year period during the peak tornado season from April to August. The intensity level of each tornado is rated using the Fujita scale, with F0 indicating the lowest level of intensity.

For each statement, select the option from the drop-down menu that completes the statement as accurately as possible according to the information provided.

Approximately_____of the F0 tornadoes recorded occurred in August.

A. 5%
B. 12%
C. 27%
D. 58%

For the tornadoes recorded, the proportion rated F1 was greatest in the month of_____.

A. April
B. May
C. June
D. July
E. August

MULTI SOURCE REASONING

1.
Planning

A city's planning committee is allocating infrastructure development funds among four geographical areas. The committee evaluated each area with respect to each of the following aspects:

- the state of existing infrastructure
- capacity for economic development
- readiness for economic development
- projected 25-year level of economic growth
- likely percentage return on investment (ROI) in infrastructure

Each area received a rating from A+ to E for each aspect evaluated. Letters earlier in the alphabet represent higher ratings. A plus following a letter indicates a slightly higher rating than the letter alone, while a minus indicates a slightly lower rating.

Funding criteria

The committee members debated how to rank the areas for allocation of spending based on the evaluation referred to in the Planning tab.

Mr. Hernandez argued for prioritizing allocation of funding to the areas that received higher overall ratings from the committee.

Mr. Li argued for prioritizing allocation of funding based on need, determined as follows: the lower the rating for the state of existing infrastructure and the higher the rating for projected 25-year economic growth, the greater the need.

Ms. Tansey argued for prioritizing allocation of funding to areas that have been given higher ratings for both capacity and readiness for economic development.

Ms. Wahid argued that areas that are expected to yield a larger percentage return on infrastructure investment should have a higher priority for funding, since this would generate more funding for future infrastructure development.

Table

The following table shows the ratings that each of the areas received for each factor in the evaluation, as well as an overall rating for the area:

Attachment:

Planning | Funding Criteria | Table

The following table shows the ratings that each of the areas received for each factor in the evaluation, as well as an overall rating for the area:

	Area 1	Area 2	Area 3	Area 4
Economic Development capacity	A	A	C+	A
Economic Development readiness	C	C	D	E
State of existing infrastructure	B	B	D	D
Expected return on investment in infrastructure	C	C	A	A+
Projected 25- level of economic growth	C+	B	A+	E
Overall rating	C+	B	B-	C+

1. For each of the following areas, select Yes if the information provided indicates that the area's projected 25-year economic growth received a higher rating than that of Area 1. Otherwise, select No.

Yes	No	
		Area 2
		Area 3
		Area 4

2. For each of the following committee members, select Yes if the information provided suggests that the member would probably give Area 2 a greater priority over Area 3 for infrastructure funding. Otherwise, select No.

Yes	No	
		Mr. Hernandez
		Mr. Li
		Ms. Tansey

3. The area that Ms. Wahid would prefer to receive top priority for infrastructure funding received which one of the following ratings for its readiness for economic development?

A. Rating A

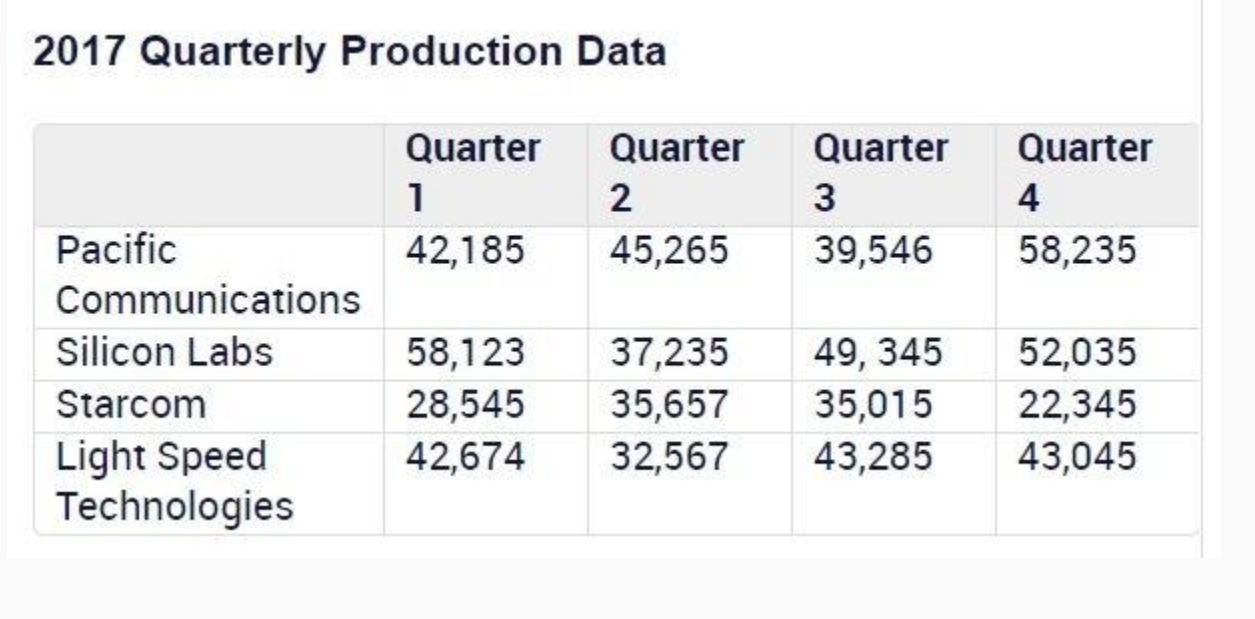
B.	Rating	B
C.	Rating	C
D.	Rating	D

E. Rating E

2

Tab 1: 2017 Quarterly Production Data

Attachment:



2017 Quarterly Production Data

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Pacific Communications	42,185	45,265	39,546	58,235
Silicon Labs	58,123	37,235	49, 345	52,035
Starcom	28,545	35,657	35,015	22,345
Light Speed Technologies	42,674	32,567	43,285	43,045

The table above gives production data in number of units for a particular type of transceiver—called an Optical SFP Transceiver—manufactured by four top telecommunications companies in 2017. Units produced in a particular quarter that are not sold during that quarter are added to warehouse inventory.

Tab 2: 2017 Quarterly Sales Data

Attachment:

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Pacific Communications	92%	85%	98%	62%
Silicon Labs	98%	103%	98%	88%
Starcom	97%	85%	78%	105%
Light Speed Technologies	86%	98%	105%	107%

For each quarter of 2017, the four companies listed in the quarterly production table sold a certain percentage of the Optical SFP Transceiver units that they produced. That percentage, rounded to the nearest whole number, is given for each quarter in the table above.

Tab 3: 2017 Revenue Data

Attachment:

	2017 Revenue
Pacific Communications	$14,670
Silicon Labs	$12,540
Starcom	$14,880
Light Speed Technologies	$15,425

12.jpg [27.63 KiB | Viewed 411 times]

The data above shows the total gross revenue in thousands of U.S. dollars for each company from the sale of Optical SFP Transceivers for the entire year in 2017.

1. For the following statements, select Supported if the scenario described would be logically supported by the data provided for the four telecommunications companies. Otherwise, select Not Supported.

Supported	Not Supported	Statement
		In the 4th quarter of 2017, Pacific Communications lost a large order for Optical SFP Transceiver units that it had expected to fill that quarter.
		Starcom substantially increased the price for its Optical SFP Transceiver units between the 1st and the 3rd quarter of 2017.
		In the 2nd quarter of 2017, Light Speed Technologies implemented new software to limit

		excess production and eliminate warehouse inventory.

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2. Which of the following can be properly inferred about the number of Optical SFP Transceiver units sold by the four companies in 2017?

A. Pacific Communications had the lowest standard deviation for the four quarterly figures.

B. Pacific Communications had the greatest range for the four quarterly figures.

C. Pacific Communications sold the largest number of units in 2017.

D. Light Speed Technologies sold the largest number of units in any individual quarter.

E. No company sold less than 25,000 units in any individual quarter.

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3. For the following statements, select Yes if the statement is true of Optical SFP Transceivers based on the data provided. Otherwise select No.

Yes	No	Statements
		At least one of the companies for which data is provided had excess inventory at the end of 2016.
		Among the four companies, Starcom had the highest average price per unit in 2017.
		None of the four companies sold more units in the fourth quarter of 2017 than they did in any other individual quarter of 2017.

3

Tab 1: Time

Computer scientists arrange problems solved by computers into categories based on the time it takes to solve them.

The time that it takes to solve a polynomial-time problem increases by a constant multiplier each time the size of the problem doubles. For instance, a polynomial time problem might take 5,000 calculations to optimize choices from a selection of 15 objects. Doubling the number of objects to 30 could increase the number of calculations by a factor of 5 to 25,000 calculations. This pattern would continue, with 60 objects requiring 125,000 calculations.

Problems that are solvable in the more complex exponential time increase in complexity by a constant multiplier with each additional item in the problem. If a computer could solve a 30-object exponential problem

in 1 hour, adding a 31st object could increase the time required to 2 hours, and a 40-object version would then take that computer 1,024 hours—more than 6 weeks.

Tab 2: NP-Complete

NP-complete problems are a special class of mathematical puzzles. An NP-complete problem can be converted efficiently to any other NPcomplete problem. It is generally believed, but not proven, that NPcomplete problems require exponential time to solve. A polynomial-time solution for any (and thus every) NP-complete problem would revolutionize mathematics and computer science.

Tab 3: Problems

A *Traveling Salesman Problem (TSP)* involves connecting multiple points with a single continuous path of the shortest possible distance, without backtracking. TSP's namesake is a common real-life scenario: a sales representative must visit every city on a list while minimizing the distance traveled. The TSP is NP-complete, but certain heuristics can quickly produce routes believed to be within 2–3 percent of the actual minimum.

A *Bounded Knapsack Problem (BKP)* involves selecting the most valuable set of items, constrained by a weight limit, from among a collection of items with different values and weights. The problem's name comes from campers, who must optimize the "value" of their camping equipment within the limits of their knapsacks' capacities. Finding an exact solution to the BKP is NP-complete.

The *Greatest Common Divisor (GCD)* of a set of numbers is the greatest integer that divides into each term of the set without remainder. Other problems involving factoring are notoriously difficult, but finding a common divisor is comparatively easy. The euclidean algorithm finds the GCD in polynomial time.

1. Consider the following statements about the BKP. On the basis of the tabbed information, determine whether the statements can be reasonably inferred about the BKP. Indicate yes if a statement can be properly inferred; otherwise indicate no.

Yes	No	
		Doubling the number of items in the problem increases the processing time to find the exact solution by a constant multiplier
		An exponential-time solution to this problem, if discovered, would be revolutionary
		A heuristic method could potentially produce an approximate solution to this problem.

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2. A microchip manufacturer wants a continuous electronic circuit to pass once through each semiconductor device on a chip in the minimum distance possible. According to the tabbed information, which of the following is true of the problem faced by the manufacturer?

A. It is mathematically impossible to find a solution in polynomial time.

B. The problem can be mathematically reduced to finding a GCD.
C. There are efficient ways to get close approximations to the actual minimum solution.
D. The manufacturer cannot solve the problem without the help of expert mathematicians or computer theoreticians.
E. Adding 10 more semiconducting devices to the chip would make the problem impossible to solve in a timely manner

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3. If a computer solves a 10-object BKP in 1 minute and an 11-object BKP in 3 minutes, how long will the computer take to solve a 13-object BKP, assuming that current beliefs about NP-complete problems are true?

A.	7	minutes
B.	9	minutes
C.	27	minutes
D.	54	minutes

E. 81 minutes

4

Discussion

The frequency of flooding onto floodplains—the lands situated adjacent to rivers and other waterways—depends on factors such as climate, drainage area, channel slope, and the absorptive capacity of soil. In rainy regions, the floodplain may be inundated frequently, and in arid regions the floodplain may remain dry for years. In many regions, floods occur primarily during the snowmelt runoff season.

Floods are often described in terms of their statistical frequency. A 100-year flood, for example, describes the level of floodwater expected to be equaled or exceeded once every 100 years. Such a flood is also considered the 1% annual exceedance probability flood (i.e., a flood with a 1% chance of being equaled or exceeded in any given year). Hydrologists commonly map the boundaries of 100-year floods to advise public officials on flood risk management and containment strategies.

Table of Waterway Statistics

The table shows the results of hydrologists' measurements of all of the waterways in Region X under the hydrologists' jurisdiction. Channel slope is the difference in elevation between two points on a waterway divided by the horizontal distance between them. Drainage area is the total surface area, upstream from the mouth of that waterway, from which water will drain to that point.

Attachment:

	DA (sq km)	ACS (m/km)	SF(%)	100-year FL (m)	100-year FB (sq km)
Jackson River	40,000	1.2	54	10.5	330
Porter River	27,000	0.9	13	12.0	210
Deer Creek	1,300	3.1	8	6.2	17
Miller Creek	660	5.5	3	7.4	6.5
Evans Creek	12	2.0	67	5.7	1.1
Bear Run Creek	2.3	12.7	16	3.3	1.8

123.jpg [67.2 KiB | Viewed 1150 times]

DA = drainage area (square kilometers)

ACS = average channel slope (meters per kilometer)

SF = snowmelt floods (% of total floods)

100-year FL = 100-year flood level (meters)

100-year FB = area within the 100-year floodplain boundary (square kilometers)

1. Which one of the following can be most logically inferred from the information given?

A. The drainage area and channel slope of a waterway are positively correlated.
B. The channel slope of a waterway is positively correlated with the area of the 100-year floodplain boundary.
C. A 5-year flood has a 20% annual exceedance probability.
D. The larger a waterway's drainage area, the more frequently its floodplain becomes inundated.
E. The greater the average channel slope of a waterway, the more prone the waterway is to snowmelt flooding.

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2. For each of the following, select Yes if it is explicitly mentioned in the passage (Discussion) but not in the table. Otherwise select No.

Yes	No	Statements
		Snowmelt flooding
		Absorptive capacity of soil
		Drainage area

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3. For each of the following statements, select Yes if the information provided indicates that the statement is true. Otherwise select No.

Yes	No	Statements
		A 100-year flood on the Jackson River would directly affect more people than would such a flood on the Porter River.
		In Region X, Evans Creek drains into Jackson River.
		The area representing the 1% annual exceedance probability for Deer Creek is 17 sq km.

5.

Tab 1: Rubinia

Historically, the Republic of Rubinia has had trouble motivating its citizens to vote in its parliamentary elections. For the past 10 election cycles, turnout among eligible Rubinian voters has been between 30 percent and 35 percent, even as neighboring countries reported voter participation in excess of 60 percent. It is possible that Rubinians vote less than their neighbors because the large number of major political parties in Rubinia dilutes the stark ideological divides characteristic of two- or three-party systems. Also, most nearby nations have moved their elections to weekends. Rubinia's longstanding tradition of holding elections during the workweek might further help to explain the low voter turnout.

Additionally, many more Rubinians claim they will vote than actually do. This tendency results in noticeably inaccurate preelection polls.

Tab 2: Survey Results

Attachment:

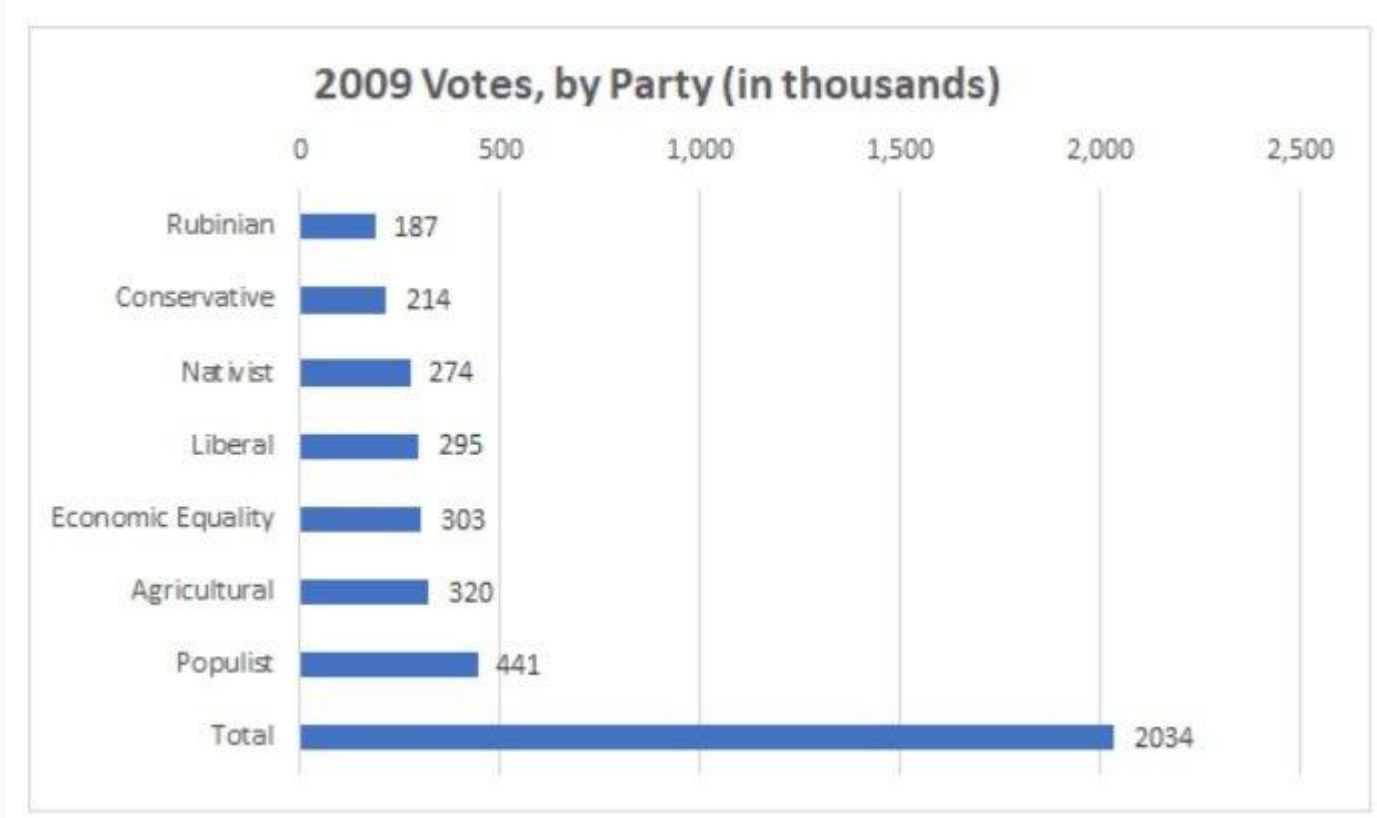
2009 Preelection Survey (sample: 1,300 eligible voters)

Agricultural Party	4%
Conservative Party	6%
Economic Equality Party	4%
Liberal Party	12%
Nativist Party	6%
Populist Party	11%
Rubinian Party	6%
Undecided but planning to vote	9%
Not planning to vote	42%

4.jpg [53.83 KiB | Viewed 370 times]

Tab 3: Election Results

Attachment:



5.jpg [35.93 KiB | Viewed 371 times]

1. For each of the following statements, select Yes if the information given supports the inference. Otherwise, select No.

Yes	No	
		Rubinia has fewer than 6 million eligible voters.
		Assuming the survey group was representative of the national population, at least 200 respondents claimed they would vote but did not.
		Rubinia would increase voting participation to the level of nearby nations if it held elections on Saturdays.

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2. For each of the following statements, select Yes if the political party received a proportion of the vote

that was greater than the proportion that the poll suggested it would receive. Otherwise, select No.

Yes	No	
		Agricultural Party
		Economic Equality Party
		Rubinian Party

3. Which of the following statements most helps to explain the results of the election, given the results of the phone survey?

A. The Liberal Party's platform is extremely moderate, and its adherents have few major ideological disputes with other parties.
B. The Populist Party is supported primarily by working-class voters who have difficulty getting time off during the workweek.
C. The Economic Equality Party is part of an international coalition of parties with sister parties in nearby states.
D. The Rubinian Party is a nationalist party that thinks Rubinia should be unconcerned with imitating its neighbor states.
E. The Conservative Party has given large amounts of money to nonpartisan nonprofit groups dedicated to improving voter turnout in Rubinia.

TWO PART ANALYSIS

1

Attachment:

Population	Location	Economic base	Residence
Au	Papua New Guinea	horticulture, foraging	sedentary
Dolgan/NG	Siberia	hunting, fishing, and wage work	semi-sedenta
Gusii	Kenya	farming and wage work	sedentary
Hadza	Tanzania	foraging	nomadic
Isanga village	Tanzania	farming and wage work	sedentary
Maragoli	Kenya	farming and wage work	sedentary
Orma	Kenya	herding livestock	semi-nomadi
Samburu	Kenya	herding livestock	semi-nomadi
Sanquianga	Colombia	fisheries	sedentary
Shuar	Ecuador	horticulture	sedentary
Sursurunga	Papua New Guinea	horticulture	sedentary
Tsimane	Bolivia	horticulture, foraging	semi-nomadi
Yasawa	Fiji	horticulture, marine foraging	sedentary

5.jpg [185.85 KiB | Viewed 986 times]

Anthropologists collected data about cultural patterns and norms for several small indigenous populations in various countries. The table displays data collected about the economic base; residential patterns (residence); degree of market integration (mean MI)—defined as the percentage of calories obtained in the marketplace; percentage of population participating in world religions (mean WR); and average community size (mean CS).

For each of the following statements about these indigenous populations, select Yes if the statement accurately reflects the data provided in the table. Otherwise, select No.

Yes	No	Statements
		The populations that forage have the lowest market integration ratings.
		Each of the populations that depend on both farming and wage work is sedentary and has a mean community size among the five largest.
		The range for market integration is less than the range for participation in world religions.

2

Four friends—Amelie, Benedikt, Chiara, and Dominic—played four rounds of a card game together. In each round, each player scored a positive integer number of points. The number of points each player scored in each round is recorded in the table, except for Chiara's score in Round 3, which the scorekeeper forgot to record and is represented by x. The winner of the game was the player whose total score (the sum of the scores for all 4 rounds) was greatest.

The friends correctly remember that Chiara scored the greatest number of points among the 4 friends in exactly 2 of the 4 rounds, and she scored a greater number of points in Round 3 than she did in each of the other 3 rounds. The position of x and x + 154 in the table sorts does not indicate anything about their values.

Player	Round 1	Round 2	Round 3	Round 4	Total
Amelie	23	46	25	38	132
Benedikt	47	52	61	65	225
Chiara	51	55	x	48	x + 154
Dominic	21	53	55	41	170

For each of the following statements, select Consistent if the statement is consistent with the information provided. Otherwise, select Not consistent.

Consistent	Not Consistent	
		Chiara's Round 3 score was 43.
		Chiara's Round 3 score was 58.
		Chiara won the game.

3

For each of the 7 zones of a national park. the table provides information about policies pertaining to camping and campfires.

Zone	Camping allowed in designated campsites	Camping allowed outside of designated campsites	Campfire allowed outside of designated campsites
1	no	yes	yes
2	yes	no	no
3	yes	yes	yes
4	yes	no	no
5	no	yes	no
6	no	yes	no
7	yes	yes	yes

For each of the following statements select Yes if statement accurately reflects the information provided. Otherwise, select No.

Yes	No	
		All of the zones allow camping in at least some areas.
		Exactly 3 of the zones that allow camping in designated campsites also allow camping outside of designated campsites.
		Exactly 2 of the zones that allow camping outside of designated campsites do NOT allow campfires outside of designated campsites.

4

The table displays data on Brazilian agricultural products in 2009.

Attachment:

Commodity	Production, world share (%)	Production, world rank	Exports, world share (%)	Exports, world rank
Beef	16	2	22	1
Chickens	15	3	38	1
Coffee	40	1	32	1
Corn	8	4	10	2
Cotton	5	5	10	4
Orange juice	56	1	82	1
Pork	4	4	12	4
Soybeans	27	2	40	2
Sugar	21	1	44	1

1.jpg [45.19 KiB | Viewed 1917 times]

For each of the following statements, select Yes if the statement can be shown to be true based on the information in the table. Otherwise select No.

Yes	No	
		No individual country produces more than one-fourth of the world's sugar.
		If Brazil produces less than 20% of the world's supply of any commodity listed in the table, Brazil is not the world's top exporter of that commodity.
		Of the commodities in the table for which Brazil ranks first in world exports, Brazil produces more than 20% of the world's supply.

5

The table shows various physical characteristics of the Great Lakes of North America.

Attachment:

Lake	Depth (feet)	Volume (cubic miles)	Surface area (square miles)
Erie	210	116	9,910
Huron	750	850	23,000
Michigan	923	1,180	22,300
Ontario	802	393	7,550
Superior	1,330	2,900	31,700

44.jpg [61.59 KiB | Viewed 901 times]

For each of the following statements, select Yes if the statement is true based solely on the information in the table; otherwise select No.

Yes	No	Statements
		The depth of Lake Ontario is the median depth of the 5 lakes.
		The lake whose depth is greatest also has the shoreline of greatest length.
		The volume of Lake Superior is greater than that of the other 4 lakes combined.