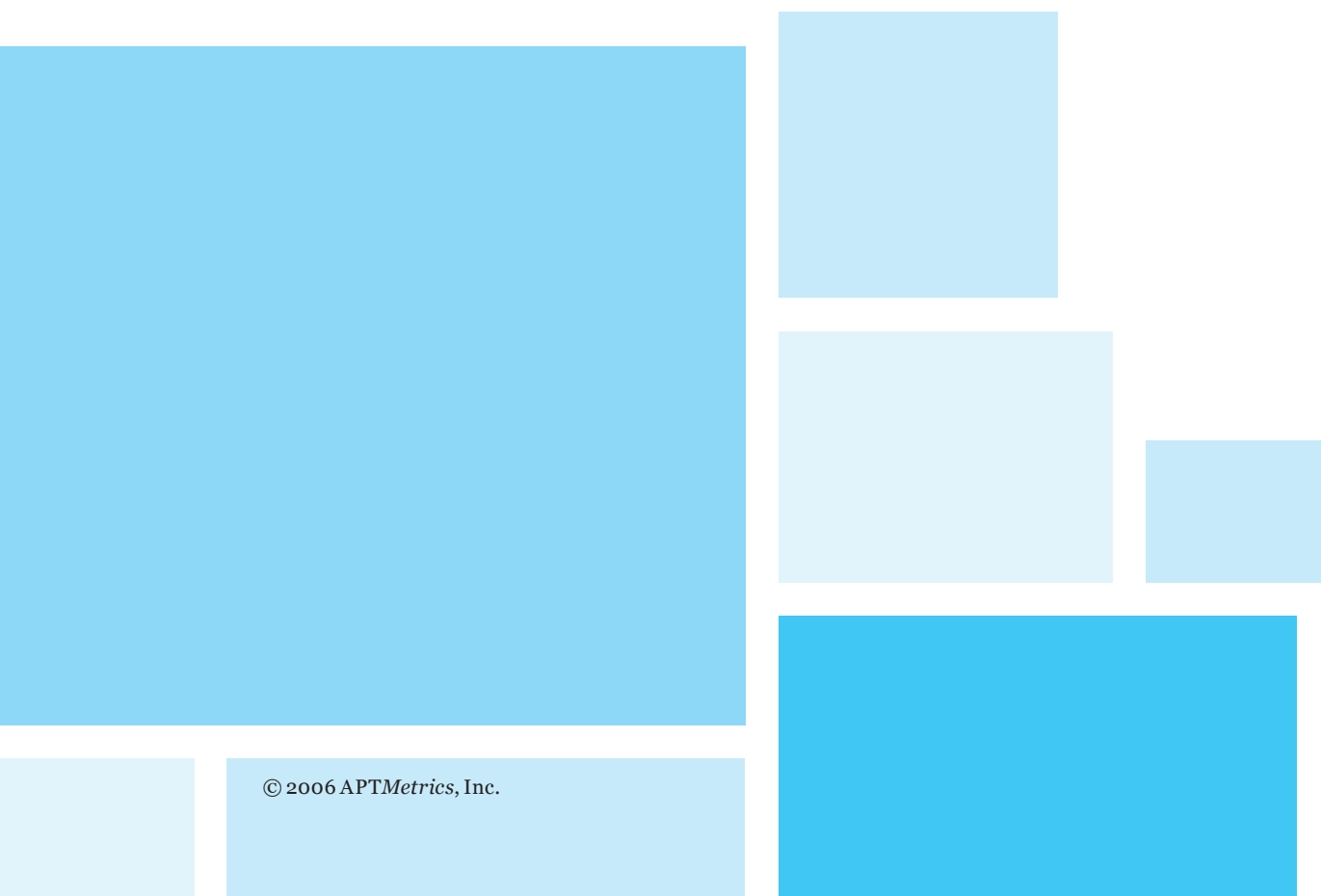


# McKinsey Problem Solving Test Practice Test B



# McKinsey Problem Solving Test

## Practice Test Overview and Instructions

This practice test has been developed to provide a sample of the actual McKinsey Problem Solving Test used for selection purposes. This test assesses your ability to solve business problems using deductive, inductive, and quantitative reasoning. This practice test contains a total of 26 questions. The actual test contains 26 questions and you will be given 60 minutes to answer as many questions as possible.

You will be presented with three scenarios based on actual McKinsey client cases. Information related to each scenario will be shown in text, tables, and exhibits. This information is presented in shaded areas and is distributed in sections throughout the scenario. The questions ask you to find the most appropriate answer to the problem as described using only the information presented. You should select one and only one answer to any question.

While completing this practice test, do not use any electronic devices (e.g., calculator, computer) when performing calculations to answer the questions. Electronic devices will not be permitted to be used during the actual test administration. Also during the actual test administration, you may use all blank space in the test booklet as scratch paper to assist you in performing any calculations and recording any notes. No scratch paper will be allowed. Booklets will be destroyed after you complete the test and will not be used in any way to determine your test scores. Your final test score will be based on the number of questions you answer correctly.

The practice scenarios begin on the next page of this booklet. Only consider information contained within the scenario when determining your answer. Considering all information presented within the scenario is critical to answering questions correctly.

After you have completed the test, score your answers using the answer key located at the end of this booklet. Add the number of correct answers to determine your final total score.

# Freddie's Shrimp Shack

*Freddie's Shrimp Shack (Freddie's)* is a chain of approximately 100 seafood restaurants located along the Gulf Coast of the United States. *Freddie's* has a reputation for serving high quality seafood at a reasonable price. Although *Freddie's* serves a wide variety of seafood, the most popular food sold is shrimp.

Two types of shrimp are available on the Gulf Coast:

- **Aquaculture Shrimp:** These shrimp are raised on farms at any time of the year. They are usually imported into the United States by large seafood wholesalers and distributors.
- **Wild Shrimp:** These shrimp are caught in the wild in the Gulf of Mexico in the summer and autumn months. Hundreds of small, family-owned boats catch the shrimp and sell them at dock shrimp processors. There are dozens of these shrimp processors scattered along the Gulf Coast. Boat owners will take the shrimp to the nearest processor who is paying the highest price. The processors then grade, de-head, and freeze the shrimp. In some cases, they also peel and de-vein the shrimp. There are two standard forms that these shrimp are sold in: headless, shell-on shrimp and peeled and de-veined (P&D) shrimp. *Freddie's* buys only headless, shell-on, wild shrimp because of their perceived higher quality.

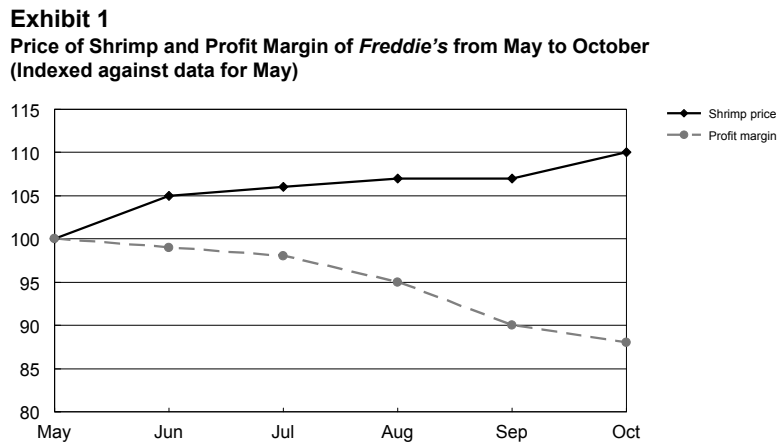
It is now October and *Freddie's* overall profitability has been falling since immediately before the summer season. The CEO has asked McKinsey to help her understand the reasons behind this trend that started in May. She states that the recent fall in profitability has been totally unexpected and she would like McKinsey to look into it. She also notes that it seems like too much of a coincidence that *Freddie's* profitability is falling at a time when the price of wild shrimp is climbing.

Table 1 shows monthly revenue for *Freddie's*, in thousands of dollars, from May to October.

	<b>May</b>	<b>June</b>	<b>July</b>	<b>August</b>	<b>September</b>	<b>October</b>
<b>Revenue</b>	1,223	1,264	1,355	1,402	1,342	1,292

## Freddie's Shrimp Shack

Exhibit 1 tracks the average price of wild shrimp in the months from May to October, as well as *Freddie's* profit margin in each of these months. In Exhibit 1, the data for each month is presented as a percentage of the data in May.



- Which of the following statements best describes the thoughts of *Freddie's* CEO regarding the recent profitability decline?
  - The CEO wants McKinsey to investigate the decline in profitability because she does not have any ideas on what is causing it
  - The CEO wants McKinsey to investigate the decline in profitability, but would not be surprised if the price of shrimp was a key cause
  - The CEO wants McKinsey to investigate how an increase in the price of shrimp can lead to a decrease in the profitability of her business
  - The CEO wants McKinsey to investigate why the price of shrimp has risen over the last few months
- Based on the data presented in Table 1 and Exhibit 1, which of the following statements is true?
  - The rate of increase in shrimp price from May to October is the same as the rate of decrease in profit margin in these months
  - Freddie's* made 5% less profit in August than it did in May
  - Freddie's* made a greater profit in August than it did in May
  - Restaurant prices for shrimp dishes were 10% higher in October than in May

## Freddie's Shrimp Shack

The research manager at *Freddie's* gives you five facts regarding customer eating habits in its restaurants as follows:

- I. Customers prefer cold dishes in hot weather
- II. Customers prefer hot dishes in the evening
- III. Most cold dishes are shrimp dishes
- IV. Hot dishes have more varied ingredients than cold dishes
- V. Shrimp dishes are the highest priced customer meal

3. Which combination of the five facts above would be sufficient to help explain the trend in *Freddie's* revenues from May to October?
- A) I, III, IV
  - B) II, IV, V
  - C) I, III, V
  - D) III, IV, V

## Freddie's Shrimp Shack

The team decides to examine the costs associated with *Freddie's* operations in greater detail. They focus on the cost of procuring shrimp for *Freddie's* dishes. The team proceeds to break down all costs involved from “boat to throat”, that is, from the moment the shrimp is caught to the moment it is eaten by a customer.

When shrimp are caught they are sold to one of the dock shrimp processors, who take off the heads and freeze the shrimp. Agents, who are employed by *Freddie's* to purchase the shrimp from the processors, then store them frozen for dispatch to a nearby restaurant. The restaurant then prepares the shrimp by peeling and de-veining them. Finally, they are washed, cooked, and served to the customer.

Exhibit 2 breaks down the current cost of each of these steps per kilogram (kg) of shrimp. (1 kg = 1000 grams).

**Exhibit 2**  
Cost in \$ per kg of Shrimp from 'Boat to Throat'

Price from boat	9.80
Processing costs/margin	1.45
Price to <i>Freddie's</i> agent	11.25
Agent costs and fees	1.70
Price to restaurant	12.95
Restaurant preparation cost	2.80
<b>Total 'boat to throat' cost</b>	<b>15.75</b>

The team investigates the option of eliminating the cost associated with restaurant preparation. Peeling and de-veining the shrimp reduces the weight by 10%. This reduction in weight is taken into account by the 'restaurant preparation cost' component of Exhibit 2.

## Freddie's Shrimp Shack

4. Which of the following values is the closest estimate of the proportion of restaurant preparation cost accounted for by the weight reduction from peeling and deveining the shrimp?
- A) 20%
  - B) 30%
  - C) 40%
  - D) 50%

The kitchen equipment supplier for *Freddie's* informs the team about a machine that will peel and de-vein shrimp automatically in the restaurants. The CEO is interested in whether this machine would reduce cost for *Freddie's*. To try to answer this question, the team compiles Table 2, which shows data regarding shrimp peeling and de-veining for both the manual and the machine processes.

	<b>Manual process</b>	<b>Machine process</b>
<b>Labor cost per hour</b>	\$6.00	\$6.00
<b>Labor time taken to peel and de-vein shrimp</b>	20 minutes per kg	1 hour for 10 kg
<b>Set up and clean-up labor time per day</b>	20 minutes	1 hour
<b>Other costs</b>		\$10,500 purchase and running costs for machine's lifetime

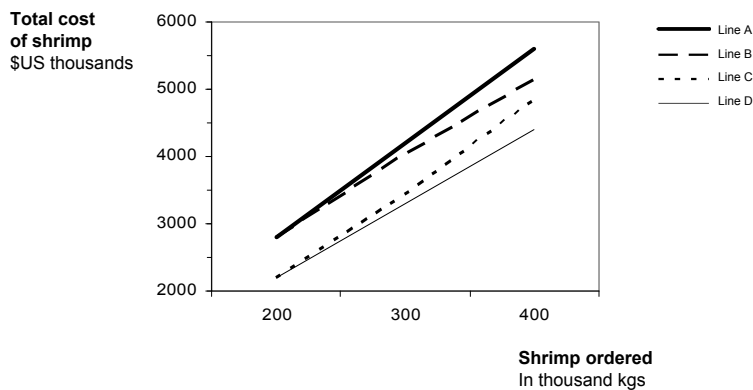
5. Assuming a machine lasts for three years and that *Freddie's* restaurants are open 350 days a year, what *minimum* volume of shrimp would a restaurant need to process before purchasing a machine becomes financially beneficial?
- A) 9kg per day
  - B) 11kg per day
  - C) 13kg per day
  - D) 15kg per day

## Freddie's Shrimp Shack

An idea suggested by *Freddie's* marketing manager is to import aquaculture shrimp for some dishes. He feels that the El Diablo Spicy Cajun Shrimp appetizer might be a suitable dish. "It is so hot and spicy", he says, "customers are unlikely to notice the difference in shrimp taste!" You discover the following facts regarding the El Diablo appetizer and the shrimp used to produce it:

- Wild shrimp cost \$13 per kg, while aquaculture shrimp cost \$14 per kg on the first 250,000 kg and \$11 per kg thereafter
- Other costs to create the El Diablo appetizer are \$3
- There is 0.25 kg of shrimp in the El Diablo appetizer

**Exhibit 3**  
Cost of Purchasing Aquaculture Shrimp



6. If *Freddie's* sells 1.2 million El Diablo dishes per year, which of the following statements is most accurate?
- A) It is \$150,000 less expensive per year to use aquaculture shrimp
  - B) It is \$150,000 more expensive per year to use aquaculture shrimp
  - C) It is \$300,000 less expensive per year to use aquaculture shrimp
  - D) It is \$300,000 more expensive per year to use aquaculture shrimp



## Freddie's Shrimp Shack

The team also compares *Freddie's* costs to that of other similar restaurants. One such restaurant is *Forrest's Shrimp Plaza (Forrest's)*, which serves a very similar menu to *Freddie's*, but is larger in scale. Table 3 compares important data for *Freddie's* and *Forrest's* from the last financial year.

	<i>Freddie's</i>	<i>Forrest's</i>
<b>Number of restaurants</b>	100	200
<b>Shrimp used per year (kg)</b>	2 million	8 million
<b>"Boat to throat" shrimp costs as % of revenue</b>	50%	62%
<b>Labor cost as % of revenue</b>	22%	23%
<b>Other cost as % of revenue</b>	13%	8%
<b>Profit margin</b>	15%	7%

7. Which of the following statements can you conclude from the data in Table 3?
- A) *Forrest's* is not as effective at procuring shrimp as *Freddie's*
  - B) *Freddie's* made a bigger profit in the last financial year than *Forrest's*
  - C) The average price of shrimp dishes is lower at *Forrest's* restaurants than at *Freddie's* restaurants
  - D) *Forrest's* restaurants serve more shrimp on average than their *Freddie's* counterparts

# Metropolis Modern Art Gallery

*Metropolis Modern Art Gallery (Gallery)* is located in Riverside, a district of the city of Metropolis. The city has a total population of 3 million.

The idea to open a modern art gallery in Metropolis was conceived in 2000, and in 2005 the formal plan was announced to the public. The *Gallery* took five years to construct and it was opened to the public in summer 2010. Funding of \$20 million was required to construct and prepare the *Gallery* during the five years prior to its opening. Seventy five percent of this funding was obtained from the government Arts Council, with the remainder coming from private donations by interested sponsors.

The *Gallery* does not charge people for admission (except to certain special exhibitions). The vast majority of the sales made in the *Gallery* come from the *Gallery's* restaurant and gift shop. This money, combined with regular private donations, is used to keep the *Gallery* running.

It is now summer 2011 and the *Gallery* had 400,000 visits in its first year since opening. The *Gallery* counts every person visiting one or more times within a single day as a new visit.

The *Gallery's* management has decided to apply to the government Arts Council for additional funding to improve the *Gallery*. They have been informed that they will need to prove to the Arts Council that the *Gallery* is benefiting the local area of Riverside enough to justify additional investment. They have determined that there are two ways in which the *Gallery* has benefited Riverside:

- Economic benefit (the impact on local business and economy)
- Social benefit (the impact on local social, educational, and recreational activity)

The Arts Council has made it clear that the economic benefit to Riverside is the critical factor that will determine whether or not they will receive additional funding.

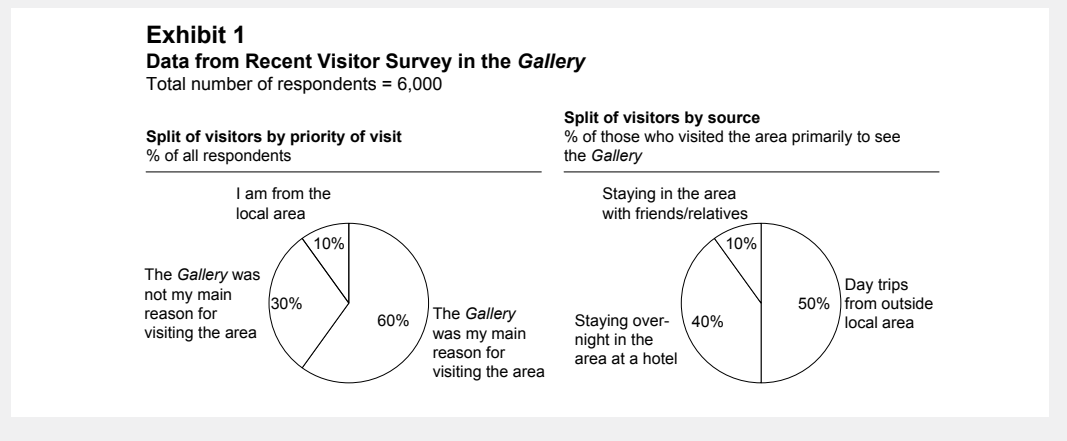
As a McKinsey consultant, you have been assigned to help the *Gallery* put forward a case for additional funding.

## Metropolis Modern Art Gallery

8. Which of the following statements is accurate regarding the *Gallery's* bid for additional funding?
- A) If the *Gallery* has provided economic benefit to Riverside, it will receive additional funding from the Arts Council
  - B) If the *Gallery* has not provided social benefit to Riverside, it will not receive additional funding from the Arts Council
  - C) If the *Gallery* has not provided economic benefit to Riverside, it will not receive additional funding from the Arts Council
  - D) If the *Gallery* has provided social benefit to Riverside, it will not receive additional funding from the Arts Council
9. If the *Gallery* estimates that 150,000 people visited in the last year and that two-thirds of them only visited once, which of the following statements is a valid conclusion about a randomly selected visit during this time period?
- A) There is a 25% chance that a visit to the *Gallery* was that person's only visit for the year
  - B) There is a 33% chance that a visit to the *Gallery* was that person's only visit for the year
  - C) There is a 66% chance that a visit to the *Gallery* was that person's only visit for the year
  - D) There is a 75% chance that a visit to the *Gallery* was that person's only visit for the year
10. Which of the following statements would be most useful in determining if the *Gallery* has provided an economic benefit to Riverside?
- A) Property values in the Riverside area and how they have changed recently
  - B) Recent changes in employment levels both in Riverside and in Metropolis
  - C) Recent changes in the popularity of arts-related events in both Riverside and in Metropolis
  - D) Recent changes in the average income for households in Riverside

## Metropolis Modern Art Gallery

During your research, you are given the results of a random survey of visitors to the *Gallery* taken over the last month. Exhibit 1 contains some results from that survey.



11. Which of the following statements is a valid conclusion based on the data presented in Exhibit 1?
- A) 24% of people spent money on an overnight hotel stay because of the *Gallery's* presence
  - B) 40% of people did not spend any money because of the *Gallery's* presence
  - C) 50% of visitors to the *Gallery* came on day trips from outside the Riverside area
  - D) 60% of visitors only came to the Riverside area to see the *Gallery*
12. How many respondents to the survey stayed with friends/relatives in Riverside because they wanted to visit the *Gallery*?
- A) 60
  - B) 360
  - C) 600
  - D) 2,400

## Metropolis Modern Art Gallery

---

After further research, the team concludes four important facts:

- The *Gallery* had \$5 million in sales in its first year of opening
- Spending in Riverside that took place outside the *Gallery*, but because the *Gallery* was there, totalled \$40 million
- The *Gallery* employed an average of 25 people (full time equivalent) in its first year of opening
- The *Gallery* staff generated the most revenue per employee of any related business in the Riverside area

13. Which of the following conclusions, if true, would best further support the *Gallery's* bid for additional funding?
- A) The *Gallery's* benefit to the local area, both economic and social, has been higher than originally expected
  - B) The *Gallery* has provided more economic benefit to the local area than the last such institution to open in Metropolis
  - C) If the trends in *Gallery* visitor numbers continues, Riverside will have the highest tourist spending levels in Metropolis within 2 years
  - D) If the *Gallery* does not obtain additional funding, it will not be able to support the expected growth in visitor numbers

# PharmaCo

*PharmaCo* is an international company that manufactures and sells pharmaceuticals. *PharmaCo* has a very strong presence in the United States, Canada, Western Europe, Japan, Australia, and New Zealand. These are referred to as developed markets. *PharmaCo* also has a small presence in other countries, which are called the emerging markets.

*PharmaCo* only manufactures and sells prescription pharmaceuticals. These pharmaceuticals are only available to patients if a doctor prescribes them. This authorisation usually occurs through the doctor issuing a prescription, which the patient usually takes to a pharmacy in order to obtain the pharmaceuticals prescribed.

There are three ways that a patient can pay for pharmaceuticals:

- The patient him/herself can pay for them (assuming he/she can afford them)
- The patient's private health insurer can pay for them (assuming the patient has a private health insurer)
- The country's government can pay for them through the state's health insurance program

Due to government regulations and strong negotiation powers with the pharmaceutical companies, the government and insurance companies pay much less per treatment compared to private patients.

The head of *PharmaCo* has asked a McKinsey team to investigate opportunities for the company to increase its sales in emerging markets in an effort to depend less on the United States market for its sales. Table 1 shows historic, current, and projected data on sales of prescription pharmaceuticals in different parts of the world.

	<b>Market size 4 years ago</b>	<b>Market size today</b>	<b>Market size in 10 years</b>
<b>North America (US and Canada)</b>	96	156	393
<b>Other developed markets</b>	138	142	190
<b>Emerging markets</b>	52	61	134

The head of *PharmaCo* has asked the McKinsey team to decide on ten specific countries to investigate more thoroughly. Based on this investigation, she directed the team to identify up to five countries where they predict additional investment in *PharmaCo*'s operations will show the greatest return over the next 10 years.

14. Based on the opinion of the head of *PharmaCo*, which of the following statements is a valid conclusion?
- A) The head of *PharmaCo* believes that the main growth in the world's prescription pharmaceutical sales over the next 10 years will be derived from emerging markets
  - B) The head of *PharmaCo* believes that the major growth in emerging markets' prescription pharmaceutical sales will be greatly affected by the growth in the US market
  - C) The head of *PharmaCo* wants to invest more money in the company's emerging markets branches relative to the US branch
  - D) The head of *PharmaCo* wants the company's future sales growth in emerging markets to increase relative to future sales growth in the US

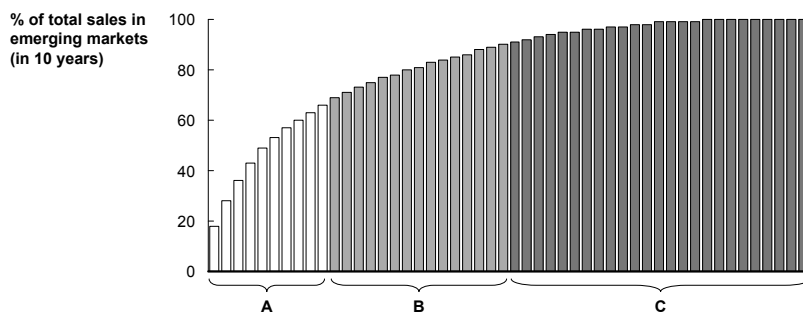
PharmaCo

15. Based on the data provided in Table 1, which of the following statements is a valid conclusion about sales of prescription pharmaceuticals?
- A) If the forecasted trends continue, sales from emerging markets will be greater than those in developed markets outside North America in 20 years from now
  - B) Looking at the past four years, the emerging markets have grown faster in terms of sales compared to the rest of the world
  - C) Sales in emerging markets are expected to grow three times quicker in the next ten years than they have grown in the previous four years
  - D) Four years ago, sales in emerging markets represented less than 10% of total global pharmaceutical sales
16. Which of the following statements, if true, best explains why future trends for North American pharmaceutical sales differ from sales in other developed markets?
- A) North America will have the strongest growth of all countries in people paying for their own medication in the future
  - B) North America will have the strongest growth in self-medication (i.e., people seeking their own treatment without visiting a doctor) of all countries in the future
  - C) Developed markets outside North America will have the strongest increase in the number of people visiting doctors in the future versus the other regions
  - D) Developed markets outside North America will have the most efficient pharmaceutical production facilities in the future versus the other regions
17. Which of the following facts does NOT explain the difference in future prescription pharmaceutical sales trends in the emerging markets versus sales in the past 4 years?
- A) The proportion of government spending dedicated to healthcare is expected to increase in emerging markets
  - B) Preventative vaccination for major diseases, such as Polio and Tuberculosis, has been much more successful in emerging markets in recent years
  - C) Personal income levels have improved in emerging markets over the last five years, which has led to a significant increase in smoking and alcohol consumption
  - D) The number of doctors per person is expected to grow at least twice as quickly in emerging markets



Exhibit 1 shows the cumulative projected sales in prescription pharmaceuticals in 10 years for the 50 largest emerging markets. The white bars in Country Group A represent the largest 10 markets, the grey bars in Country Group B represent the next 15 largest markets, while the black bars in Country Group C represent the remaining 25 markets. The names of the countries have been removed from this Exhibit for simplicity, but are available to the team.

**Exhibit 1**  
**Cumulative Sales in 10 years for the 50 Emerging Markets with the Largest Sales of Prescription Pharmaceuticals**



18. Which of the following figures is closest to the projected size in 10 years of the second largest prescription pharmaceuticals market in Exhibit 1?
- A) \$13.4 billion
  - B) \$37.5 billion
  - C) \$71.7 billion
  - D) \$200.8 billion

In an attempt to examine the market in certain countries in greater detail the team focuses on the investigation of two issues:

- First, the team decides to examine the level of inherent risk in each country. Inherent risk refers to the level of uncertainty regarding how the overall market will develop in each country which is often indicated by the volatility of the country's economic growth from year to year. Inherent risk can impact the pharmaceutical market in these countries and is out of *PharmaCo's* direct control.
- Second, the team decides to examine the ease of access to the prescription pharmaceutical market in each country. Ease of access refers to the extent to which barriers exist in the prescription pharmaceuticals market that prevent *PharmaCo* from increasing its sales in these countries. The team notes that *PharmaCo* does have some influence over ease of access.

The team collects publicly available data on four important measures for each of the ten countries. This data is presented in Table 2 for four of the countries, labelled M, N, P, and Q.

Measure	Explanation	Country M	Country N	Country P	Country Q
<b>Maximum recent economic growth</b>	Highest one year economic growth in the last 5 years	10.2%	2.3%	5.3%	3.3%
<b>Minimum recent economic growth</b>	Lowest one year economic growth in the last 5 years	-8.3%	1.6%	-0.2%	1.8%
<b>Country economic risk rating</b>	Ranked A: highest risk to E: lowest risk	B	D	C	D
<b>Country political corruption rating</b>	Ranked 1: least corrupt to 10: most corrupt	8	3	5	3

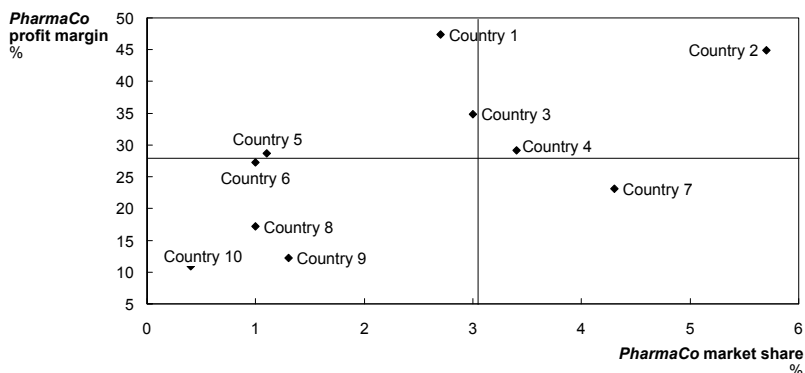
## PharmaCo

19. Which of the following lists is the best ranking of the four countries (i.e., M, N, P, Q) in terms of inherent risk, from LEAST risky to most risky?
- A) Q, N, M, P
  - B) N, P, Q, M
  - C) N, Q, P, M
  - D) Q, N, P, M
20. Which of the following statements is FALSE based on Table 2?
- A) Country N had higher average economic growth in the last five years than Country Q
  - B) The country economic risk rating is based on the difference between maximum and minimum economic growth in the past five years
  - C) The country economic risk rating is based on the country political corruption rating
  - D) Highest to lowest ranking on maximum recent economic growth is the same as lowest to highest ranking on minimum recent economic growth

Exhibit 2 maps the 10 countries under consideration onto a grid which illustrates *PharmaCo's* current share of the prescription pharmaceutical sales in each country (i.e., its market share) and *PharmaCo's* current profit margin in each country.

### Exhibit 2

*PharmaCo's* Market Share and Profit Margin today in the 10 markets under consideration



PharmaCo

21. Given Exhibit 2, which of the following statements, if true, would NOT help the team determine the ease of access for *PharmaCo* in each market?
- A) The greater the share of market for the company, the harder it is for the company to increase revenue
  - B) The greater the profit margin for the company, the harder it is for the company to increase profits
  - C) The better the company is performing, the more risky it is to make any changes to the company
  - D) The worse the company is performing, the more likely it is that there are good opportunities for it to grow
22. Based on the data in Exhibit 2 regarding *PharmaCo's* performance in the various countries, which of the following statements is a valid conclusion?
- A) Country 2 makes the greatest profit per dollar sales of all 10 countries
  - B) Country 1 contributes approximately 4 times more profit per dollar sales than Country 10
  - C) Country 10 has the lowest sales of all ten countries under consideration
  - D) Countries 5 and 6 contribute approximately the same amount to *PharmaCo's* overall profit
23. If Country 3 has a total prescription pharmaceutical market of \$1.2 billion, which of the following amounts best approximates *PharmaCo's* profit in Country 3 today?
- A) \$12.6 million
  - B) \$36.0 million
  - C) \$37.2 million
  - D) \$42.0 million

24. Which of the following points is NOT a valid reason for the poor market share of *PharmaCo* in Country 10 in Exhibit 2?
- A) *PharmaCo*'s competitors in Country 10 frequently bribe doctors to prescribe their brand of pharmaceutical
  - B) *PharmaCo*'s sales force in Country 10 is mainly composed of people transferred from developed markets, few of whom speak the local language fluently
  - C) A large number of people in Country 10 seek treatment for their illness through local traditional medicine, consisting entirely of natural herbal remedies
  - D) There is no patent protection in Country 10, which means that many local companies can copy *PharmaCo*'s products and sell them at lower prices

The team also sets out to determine the relative propensity of people to pay for their own medication in the ten countries under consideration. For countries W, X, Y, and Z, Table 3 shows the average annual household income level, in local currency, referred to as c. The table also provides the current \$US basic exchange rate for each of the local currencies, referred to as e. Finally, the Purchasing Power Parity (PPP) exchange rate for each country is shown in Table 3, and is referred to as p. Applying the PPP exchange rate to the converted \$US value of the local currency will indicate the \$US value of goods that can be purchased locally with that amount of currency. This helps account for the differences in costs of living in the various countries under consideration.

	<b>Country W</b>	<b>Country X</b>	<b>Country Y</b>	<b>Country Z</b>
<b>Average household income (local currency) (c)</b>	80,663	23,445	453,554	250,664
<b>Basic exchange rate (local currency unit per \$US) (e)</b>	6.70	0.90	7.30	3.70
<b>PPP exchange rate (purchasing power per \$US) (p)</b>	2.10	1.30	1.50	0.90

PharmaCo

25. Which country has the highest average household income level in \$US according to basic exchange rates?
- A) Country W
  - B) Country X
  - C) Country Y
  - D) Country Z
26. Which of the following formulae calculates the \$US value of goods that can be purchased locally by an average household with their entire annual income?
- A)  $(c \times p) / e$
  - B)  $c / (e \times p)$
  - C)  $(c \times e) / p$
  - D)  $c \times e \times p$

# Answer Key

## Freddie's Shrimp Shack

1. B – The CEO states that she wants the team to look into the recent decline in profitability and also indicates that she is suspicious that the price of shrimp may be related to this. Response B is the only response that captures both of these elements of the CEO's thoughts.
2. C – Profit equals revenue (from Table 1) multiplied by profit margin (from Exhibit 1). If *Freddie's* profit margin in May is  $p$ , the profit in May is  $1,223 \times p$ . *Freddie's* profit in August is  $1,402 \times 0.95 \times p = 1,332 \times p$ . So profit in August is greater than profit in May. Response A is incorrect by observation of Exhibit 1. Response B is incorrect as the data in Exhibit 1 refers to profit margin, and not profit. Response D is incorrect as shrimp price increases and restaurant price increases are not necessarily the same.
3. C – If people prefer cold dishes in hot weather (I), and most cold dishes are shrimp dishes (III) and shrimp dishes are the highest price meals (V), this is sufficient to reasonably conclude that average meal price, and hence revenue, would increase into the summer months and decrease again following this, which is the trend in Table 1. All other responses contain only a subset of facts I, III and V along with other facts which are not relevant.
4. D – From Exhibit 2, 1kg of shrimp costs the restaurant \$12.95. Therefore, the 10% weight loss in peeling and deveining the shrimp costs the restaurant \$1.30 ( $= 10\% \times \$12.95$ ). As a proportion of the total restaurant preparation cost of \$2.80, this represents 46%. Response D is the closest estimate of this.
5. B – From Table 2, the manual process costs \$2 per kg of shrimp in labor, plus \$2 per day in setup and clean-up labour. The machine process costs 60c per kg of shrimp in labor, plus \$6 per day in setup and clean-up labor. To find a breakeven point, the difference between the total labor cost for the manual process and the total labor cost for the machine process must be more than the annual machine costs of \$3,500. If the daily volume of shrimp is  $y$  kg, then  $(2y + 2) \times 350 - (0.6y + 6) \times 350 > 3,500$ . Solving for  $y$  gives  $y > 10$ . Response B is the minimum which satisfies this.

## Answers

---

6. B – Producing 1.2m dishes at 0.25 kg of shrimp per dish requires 300,000 kg of shrimp. 300,000 kg of wild shrimp costs \$3.9m (= 300,000 kg x \$13/kg). 300,000 kg of aquaculture shrimp costs \$4.05m (= 250,000 kg x \$14/kg + 50,000 kg x \$11/kg). Therefore aquaculture shrimp are \$150,000 more expensive.
7. D – From Table 3, the average Shrimp used per restaurant is 200,000 kg for *Freddie's* and 400,000 kg for *Forrest's*. It is therefore reasonable to conclude that *Forrest's* restaurants serve more shrimp on average than *Freddie's*. Response A cannot be concluded as procurement is only a part of the 'boat to throat' cost. Response B cannot be concluded as there is no information provided on revenues or profit, only on profit margin. Response C cannot be concluded as there is no information provided that would allow a calculation of an average price of shrimp dishes.

### Metropolis Modern Art Gallery

8. C – Since economic benefit is the critical factor, this must be demonstrated to receive additional funding. Responses B and D are not accurate, since they refer to social benefit, which is not the critical factor. Response A is not accurate because economic benefit is not the only factor in the decision.
9. A – 100,000 people visited the *Gallery* once this year (= 150,000 x 2/3). Since there has been a total of 400,000 visits, this means that there is a 25% chance that a visit was that person's only visit.
10. B – In order to determine if the *Gallery* has provided an economic benefit to Riverside, it is necessary to look at an economic indicator, and to compare this indicator for Riverside to the same indicator for Metropolis as a whole, in order to ensure that any economic changes are not simply a result of broader changes across the city. Response B is the only response that refers to economic indicator data for both Riverside and Metropolis as a whole.
11. A – 60% of visitors were in the area primarily because of the *Gallery*, and 40% of those visitors stayed overnight in the area at a hotel. Therefore 24% (=60% x 40%) spent money on an overnight hotel stay because of the *Gallery's* presence. Response B cannot be concluded as it is not known from Exhibit 1 exactly what money visitors spent and why. Response C cannot be concluded as the data in Exhibit 1 only asks this question to surveyed visitors who were primarily in the area to visit the *Gallery*, and not all surveyed visitors. Response D cannot



## Answers

---

be concluded as there is no data in Exhibit 1 about the reasons that surveyed visitors had for visiting Riverside other than visiting the *Gallery*.

12. B – There were 6,000 respondents in total, and 3,600 of these were visiting the area primarily to see the *Gallery* ( $= 6,000 \times 60\%$ ). Of these, 360 stayed with friends/relatives ( $= 3,600 \times 10\%$ ).
13. C – Response C demonstrates an economic benefit to Riverside, and also implies that this benefit is conditional on the continuation of funding ('If the trends in *Gallery* visitor numbers continue'). Responses A and B only address the economic benefit to date and do not address the future need for funding. Response D does not address the issue of economic benefit at all.

## PharmaCo

14. D – The head of *PharmaCo* referred to increasing sales in emerging markets in order to depend less on the United States for sales. This implies that emerging markets should account for a greater percentage of sales in the future, and the US should account for a smaller percentage of sales. This, in turn, implies that sales in emerging markets should grow more rapidly than sales in the US. Responses A and B are not valid as they refer to total market sales growth, which the head of *PharmaCo* does not address in her instructions to the team. Response C is not valid as the head of *PharmaCo* has not mentioned anything about the amount of investment she would like to make.
15. A – Sales in emerging markets are forecasted to more than double in the next 10 years, which sales in 'Other developed markets' will increase by about one third. Projecting this forward a further 10 years, sales in emerging markets will more than double again to over \$270bn, while sales in 'Other developed markets' will increase by a third to approximately \$255bn. Response B is incorrect as sales in emerging markets have grown by about 17% compared to about 27% in the other markets. Response C is incorrect as this would imply a growth of approximately 50% every 4 years ( $= 17\% \times 3$ ), which would take emerging markets past \$134bn already in 8 years from today. Response D is incorrect as emerging markets sales represented \$52bn out of a total of \$286bn four years ago, which is more than 10%.

## Answers

---

16. A – The introduction states that governments and insurers pay much less for pharmaceuticals compared to private patients. Therefore, if North America has the strongest growth in people paying for their own medication, this implies the strongest growth in average price and hence the strongest revenue growth, which is consistent with the data in Table 1. Response B will have no impact on pharmaceutical sales as these require a doctor to be visited. Response C does not explain why North American sales will grow more rapidly than those in other developed markets. Response D does not address the question of future sales of pharmaceuticals.
17. B – Greater success in preventative vaccination would imply the reduction of disease incidence, which would not support the rapid increase in pharmaceutical sales in the future shown for emerging markets in Table 1. Responses A (increased government spending), C (increasingly ‘unhealthy’ lifestyles) and D (greater access to doctors) all support an expected increase in pharmaceutical sales.
18. A – Since the data in Exhibit 1 is cumulative, the second largest market is approximately 10% (= 28% - 18%) of the total emerging markets sales in 10 years. From Table 1, this is 10% of \$134bn which is \$13.4bn.
19. C – The inherent risk is indicated by the volatility of economic growth. From Table 2, the best measure of this is the difference between the maximum recent economic growth and the minimum recent economic growth. Calculating each difference, the ranking is N (0.7), Q (1.5), P (5.5), M (18.5). An alternative method is to simply observe from the maximum and minimum economic growth data that M has the highest difference and P has the second highest difference. This eliminates Responses A and B, and a simple calculation for Countries N and Q will determine that Response C is the correct response.
20. D – The specified rankings are M, P, Q, N (maximum) and M, P, N, Q (minimum) which are not the same. Response A cannot be ruled out as false due to lack of detailed information on annual economic growth rates. Responses B and C cannot be ruled out as false as there are consistencies between the relevant rankings of the four countries on these measures.

## Answers

---

21. C – This does not address the ease of access into a market, but rather the level of risk involved in making changes to the company. All other responses address barriers to, or opportunities for, growth, which is relevant for determining the ease of access to a market.
22. B – From Exhibit 2, Country 10 has a profit margin of ~12% which Country 1 has a profit margin on ~48%. This implies that Country 1 contributes approximately 4 times as much profit per dollar sales than Country 10. Response A is incorrect, as Country 1 has the highest profit margin. Response C cannot be concluded as there is no data on absolute dollar sales provided in Exhibit 2. Similarly Response D cannot be concluded as there is no data on absolute dollar profit provided in Exhibit 2.
23. A – Country 3 generates ~\$36m in sales for *PharmaCo* (= \$1.2bn x ~3%). Total profit for *PharmaCo* in Country 3 is therefore ~\$12.6m (= ~\$36m x ~35%).
24. C – This response would impact the entire prescription market and therefore would not help explain *PharmaCo*'s low market share. Responses A and D represent ways in which *PharmaCo* can be impacted by competition, which would help explain its low market share. Response B represents a barrier to generating sales in the market, which would also explain *PharmaCo*'s low market share.
25. D – Dividing average household income (the numerator) by the basic exchange rate (the denominator) shows that only Countries Y and Z are contenders for the highest average household income in US\$. (Countries W and X are much lower than Y and Z). Observe that the numerator for Country Z is a lot more than half of that of Country Y, while the denominator for Country Z is very close to half that of Country Y. This implies that the calculation for Country Z will produce a higher result than for Country Y.
26. A – According to the description provided, first the household income in US dollars must be calculated by dividing local household income by basic exchange rate – this is  $c/e$ . Since  $p$  represents the purchasing power per US\$, we can multiply the US\$ income by  $p$  to understand the total value of goods that can be purchased with that income. It only remains to observe that  $c/e \times p = (c \times p)/e$ .

