

## SECTION E - XAT Model Questions

*This model only indicates general pattern of questions that may be asked in XAT 2017. These are only indicative in nature and the questions in the Test may or may not be on the same lines. The test may have multiple sections, to evaluate candidate's quantitative, qualitative, verbal, data interpretive and decision making abilities. Wrong questions may carry negative marks.*

**Analyse the following passage and provide appropriate answers for the questions 1 through 4 that follow.**

An example of scientist who could measure without instruments is Enrico Fermi (1901-1954), a physicist who won the Nobel Prize in physics in 1938. He had a well-developed knack for intuitive, even casual-sounding measurements. One renowned example of his measurement skills was demonstrated at the first detonation of the atom bomb, the Trinity Test site, on July 16, 1945, where he was one of the atomic scientists observing the blast from base camp. While final adjustments were being made to instruments used to measure the yield of the blast, Fermi was making confetti out of a page of notebook paper. As the wind from the initial blast wave began to blow through the camp, he slowly dribbled the confetti into the air, observing how far back it was scattered by the blast (taking the farthest scattered pieces as being the peak of the pressure wave). Fermi concluded that the yield must be greater than 10 Kilotons. This would have been news, since other initial observers of the blast did not know that lower limit. After much analysis of the instrument readings, the final yield estimate was determined to be 18.6 Kilotons. Like Eratosthenes, Fermi was aware of a rule relating one simple observation-the scattering of confetti in the wind – to a quantity he wanted measure.

The value of quick estimates was something Fermi was familiar with throughout his career. He was famous for teaching his students skills at approximation of fanciful-sounding quantities that, at first glance, they might presume they knew nothing about. The best-known example of such a “Fermi question” was Fermi asking his students to estimate the number of piano tuners in Chicago, when no one knows the answer. His students-science and engineering majors-would begin by saying that they could not possibly know anything about such a quantity. Of course, some solutions would be to simply do a count of every piano tuner perhaps by looking up advertisements, checking with a licensing agency of some sort, and so on. But Fermi was trying to teach his students how to solve problems where the ability to confirm the results

would not be so easy. He wanted them to figure out that they knew something about the quantity in question.

1. *Suppose you apply the same logic as Fermi applied to confetti, which of the following statements would be the most appropriate?*
  - (a) You can calculate the minimum pressure inside the cooker by calculating the maximum distance travelled by any of its parts after it explodes.
  - (b) You can calculate the average potency of a fire cracker by calculating the distance covered by one its bigger fragments.
  - (c) You can easily find out the average potency of an earthquake by measuring the length of a crack it makes on the surface of the earth.
  - (d) You can calculate the exact volume of water stored in a tank by measuring the distance covered by the stream of water coming out of the tap fixed on the lower corner of the tank.
  - (e) All of the above conclusions can be drawn.
2. *Quick estimate, as per Fermi, is most useful in:*
  - (a) In finding an approximate that is more useful than existing values.
  - (b) In finding out the exact minimum value of an estimate
  - (c) In finding out the exact maximum value of an estimate
  - (d) In finding out the range of values of an estimate
  - (e) In finding out the average value of an estimate
3. *Given below are some statements that attempt to capture the central idea of the passage:*
  - (a) It is useful to estimate; even when the exact answer is known.
  - (b) It is possible to estimate any physical quantity.
  - (c) It is possible to estimate the number of units of a newly launched car that can be sold in a city.
  - (d) Fermi was a genius.

Which of the following statement(s) best captures the central idea?

- (a) 1,2 and 4
- (b) 2,3 and 4
- (c) 2 and 3
- (d) 2 only
- (e) 1,2 and 3

4. Read the statements given below:

- (a) Atomic bomb detonation was a result of Fermi's Nobel Prize contribution
- (b) Fermi's students respected him as a scientist
- (c) Yield of atomic bomb can only be measured in Kilotons

Which of the following statement(s) can be inferred from the passage?

- (a) 1,2
- (b) 2,3
- (c) 1,3
- (d) 2 only
- (e) None of the three statements is correct

**Analyse the following passage and answer the questions 5-6**

The new experimentalists have shown how experimental results can be substantiated and experimental effects produced by an array of strategies involving practical interventions, cross-checking and error control, and elimination in a way that can be, and typically is, independent of high-level theory. As a consequence of this, they are able to give an account of progress in science that construes it as the accumulation of experimental knowledge. Adopting the idea that the best theories are those that survive the severest tests, and understanding a severe experimental test of a claim as one that the claim is likely to fail if it is false, the new experimentalists can show how experiment can bear on the comparison of radically different theories, and also how experiment can serve to trigger scientific revolutions.

5. The main contribution of the new experimentalists has been to

- (a) show the advantages of having experimentalists in development of theories.
- (b) distinguish between experimentally valid theories and speculative theories.
- (c) illustrate the advantages and disadvantages of using sound experimental methods.
- (d) claim how experimental knowledge is always better than speculative theories.
- (e) illustrate how scientific knowledge is accumulation of valid experimental results.

6. Which one of the following would be a direct outcome of the ideas in the passage?

- (a) All those who saw apple falling after Issac Newton are engaging in severe test of the theory of gravity.
- (b) Religious explanations of formation of universe should be included in scientific knowledge.
- (c) The theory that Earth is the center of the universe would be a part of scientific knowledge because it has not been subjected to severe tests.
- (d) Roentgen's discovery of X-Rays was serendipitous and hence has a claim to being included in experimental scientific knowledge.
- (e) The structure of Benzene molecule is speculative but should still be included in scientific knowledge because this is no alternative explanation.

7. A candidate in the medical viva voce exam faced a tinge of intellectual \_\_\_\_\_ when asked to spell the \_\_\_\_\_ gland. The fact that he carried notes on his person would definitely be termed as \_\_\_\_\_ by faculty, but may be termed as \_\_\_\_\_ by more generous sections of students.

- (a) ambivalence, prostrate, amoral, immoral
- (b) ambiguity, prostrate, amoral, immoral
- (c) ambivalence, prostrate, immoral, amoral
- (d) ambivalence, prostate, immoral, amoral
- (e) ambiguity, prostrate, immoral, amoral

8. If a person makes the statement: "I never speak the truth."

The person can be said to be \_\_\_\_\_

- (a) speaking the truth
- (b) lying
- (c) lying as well as speaking the truth
- (d) making a logically contradictory statement
- (e) partially speaking the truth and partially lying

9. *Gourmet is to gourmand as*

- (a) aquatic is to aqueduct
- (b) foliage is to fodder
- (c) ecclesiastic is to earthy
- (d) election is to elector
- (e) epitaph is to epilogue

Read the following caselet and choose the best alternative (Questions 10 – 13):

### The BIG and Colourful Company

You are running "BIG and Colourful (BnC)" company that sells books to customers through three retail formats:

- (a) You can buy books from bookstores,
- (b) You can buy books from supermarket,
- (c) You can order books over the Internet (Online).

Your manager has an interesting way of classifying expenses: some of the expenses are classified in terms of size: Big, small and Medium; and others are classified in terms of the colours Red, Yellow, Green and Violet. The company has a history of categorizing overall costs into initial costs and additional costs. Additional costs are equal to the sum of Big, Small and Medium expenses. There are two types of margins, contribution (sales minus initial costs) and profit (contribution minus additional costs). Given below is the data about sales and costs of BnC:

Sales		60000
Initial Costs		39000
Contribution (Sales-Initial costs)		21000
Additional Costs		
Big	9300	
Small	3000	
Medium	3500	
		15800
Profit (Contribution – Additional Cost)		5200

Each of the Big, Small and Medium cost is categorized by the manager into Red, Yellow, Green and Violet costs. Breakdown of the additional costs under these headings is shown in the table below:

Expenses	Total	Red	Yellow	Green	Violet
Big	9300	5100	1200	1400	1600
Small	3000		400	2000	600
Medium	3500	400	1500	1400	200
Total	15800	5500	3100	4800	2400

Red, Yellow, Green and Violet costs are allocated to different retail formats. These costs are apportioned in the ratio of number of units consumed by each retail format. The number of units consumed by each retail format is given in the table below:

Retail Format	Red	Yellow	Green	Violet
Online	200	50	50	50
Supermarket	65	20	21	21
Book Store	10	30	9	9
Total	275	100	80	80

10. Read the following statements:

Statement I. Online store accounted for 50% of the sales at BnC and the ratio of supermarket sales and book store sales is 1:2.

Statement II. Initial Cost is allocated in the ratio of sales.

If you want to calculate the profit/loss from the different retail formats, then

- (a) Statement I alone is sufficient to calculate the profit/loss.
- (b) Statement II alone is sufficient to calculate the profit/loss.
- (c) Both statements I and II are required to calculate the profit/loss.

- (d) Either of the two statements is sufficient to calculate the profit/loss.
- (e) Neither Statement I nor Statement II is sufficient to calculate the profit/loss.

**Based on your answer to the above question, answer question nos. 11 – 13**

11. What is the profit/loss from “online” sales?

- (a) 0
- (b) – 310
- (c) + 20
- (d) + 450
- (e) Cannot be determined from given information

12. Which retail format is least profit making for BnC?

- (a) Online
- (b) Supermarket
- (c) Book Store
- (d) All formats are loss making.
- (e) All formats are profit making.

13. Which retail format gives the highest profit for BnC?

- (a) Book Store
- (b) Supermarket
- (c) Online
- (d) All are equally profitable.
- (e) Cannot be determined from given information.

14. Read the sentences and choose the option that best arranges them in a logical order.

- (a) Some of these are tangible while others are not.
- (b) The micro factors look at brand building, product development, competition, pricing, decision making within organizations etc.

- (c) Another way to classify these factors is to distinguish which of them are macro in nature and which of them are micro.
- (d) The macro factors comprise government policies, state of the economy, changing demographics etc.
- (e) The factors influencing forecasts include social, technological, economic, political, religious, ethnic, governmental, and natural factors.

- (a) E-A-C-D-B
- (b) E-C-B-D-A
- (c) A-E-C-D-B
- (d) D-B-A-C-E
- (e) E-D-B-A-C

15. A salesman sells two kinds of trousers: cotton and woolen. A pair of cotton trousers is sold at 30% profit and a pair of woolen trousers is sold at 50% profit. The salesman has calculated that if he sells 100% more woolen trousers than cotton trousers, his overall profit will be 45%. However, he ends up selling 50% more cotton trousers than woolen trousers. What will be his overall profit?

- (a) 37.5%
- (b) 40%
- (c) 41%
- (d) 42.33%
- (e) None of the above.

16. Rajesh walks to and fro to a shopping mall. He spends 30 minutes shopping. If he walks at speed of 10 km an hour, he returns to home at 19:00 hours. If he walks at 15 km an hour, he returns to home at 18.30 hours. How fast must he walk in order to return home at 18.15 hours?

- (a) 17 km/hour
- (b) 17.5 km/hour
- (c) 18 km/hour
- (d) 19 km/hour
- (e) None of the above.

17. A shop sells two kinds of rolls – egg roll and mutton roll. Onion, tomato, carrot, chilli sauce and tomato sauce are the additional ingredients. You can have any combination of additional ingredients, or have standard rolls without any additional ingredients subject to the following constraints:

- (a) You can have tomato sauce if you have an egg roll, but not if you have a mutton roll.
- (b) If you have onion or tomato or both you can have chilli sauce, but not otherwise.

*How many different rolls can be ordered according to these rules?*

- (a) 21                      (b) 33                      (c) 40  
 (d) 42                      (e) None of the above.
18. Let  $a$  and  $b$  be the roots of the quadratic equation  $x^2 + 3x - 1 = 0$ . If  $P_n = an + bn$  for  $n \geq 0$ , Then, for  $n \geq 2$ ,  $P_n =$
- (a)  $-3P_{n-1} + P_{n-2}$                       (b)  $3P_{n-1} - P_{n-2}$   
 (c)  $-P_{n-1} + 3P_{n-2}$                       (d)  $P_{n-1} + 3P_{n-2}$   
 (e) None of the above

19. A rural child specialist has to determine the weight of five children of different ages. He knows from his past experience that each of the children would weigh less than 30 Kg and each of them would have different weights. Unfortunately, the scale available in the village can measure weight only over 30 Kg. The doctor decides to weigh the children in pairs. However his new assistant weighed the children without noting down the names. The weights were :35,36,37,39,40,41,42,45,46 and 47 Kg. The weight of the lightest child is:
- (a) 15 Kg                      (b) 16 Kg                      (c) 17 Kg  
 (d) 18 Kg                      (e) 20 Kg

20. An automobile company's annual sales of its small cars depend on the state of the economy as well as on whether the company uses some high profile individual as its brand ambassador in advertisements of its product. The state of the economy is "good", "okay" and "bad" with probabilities 0.3, 0.4 and 0.3 respectively. The company may choose a high profile individual as its brand ambassador in TV ads or may go for the TV ads without a high profile brand ambassador.

*If the company fixes price at Rs. 3.5 lakh, the annual sales of its small cars for different states of the economy and for different kinds of TV ads are summarized in table 1. The figures in the first row are annual sales of the small cars when the company uses a high profile individual as its brand ambassador in its TV ads and the*

*ones in the second row are that when the company does not use any brand ambassador in its TV ads, for different states of the economy.*

	"Good"	"Okay"	"Bad"
With brand ambassador	100000	80000	50000
Without brand ambassador	80000	50000	30000

*Without knowing what exactly will be the state of the economy in the coming one year, the company will either have to sign a TV ad contract with some high profile individual, who will be the company's brand ambassador for its small car for the next one year, or go for a TV ad without featuring any high profile individual. It incurs a cost of Rs. 3.45 lakh (excluding the payment to the brand ambassador) to put a car on the road.*

*When the company's profit is uncertain, the company makes decisions on basis of its expected profit. If the company can earn a profit  $X_i$  with probability  $p_i$  (the probability depends on the state of economy), then the expected profit of the company is  $\sum X_i P_i$*

21. The maximum that the company can afford to pay its brand ambassador is
- (a) Rs. 10.0 crore                      (b) Rs. 10.6 crore  
 (c) Rs. 10.8 crore                      (d) Rs. 12.0 crore  
 (e) Rs. 16.4 crore
22. Mr Khan, a popular film actor, agreed to sign the contract to become the company's brand ambassador for Rs. 9 crore. The cost to the company of putting a car on the road also got escalated. The maximum escalation in cost of putting a car on the road, for which the company can afford to sign the contract with Mr. Khan is
- (a) Rs. 900                      (b) Rs. 967                      (c) Rs. 1250  
 (d) Rs. 1267                      (e) Rs. 1333
23. Mr. Khan, a popular film actor, agreed to sign the contract to become the company's brand ambassador for Rs. 9 crore. The cost to the company of putting a car on the road also got escalated by Rs. 1000. If the company signs the contract with Mr. Khan, its profit will
- (a) increase by Rs. 40 lakh  
 (b) increase by Rs. 60 lakh



- (c) decrease by Rs. 20 lakh
- (d) decrease by Rs. 40 lakh
- (e) decrease by Rs. 50 lakh

24. The scheduling officer for a local police department is trying to schedule additional patrol units in each of two neighbourhoods – southern and northern. She knows that on any given day, the probabilities of major crimes and minor crimes being committed in the northern neighbourhood were 0.418 and 0.612, respectively, and that the corresponding probabilities in the southern neighbourhood were 0.355 and 0.520. Assuming that all crime occur independent of each other and likewise that crime in the two neighbourhoods are independent of each other, what is the probability that no crime of either type is committed in either neighbourhood on any given day?

- (a) 0.069                      (b) 0.225                      (c) 0.690
- (d) 0.775                      (e) None of the above

**Answer Questions 25 and 26 from the data given below:**

25. Arun has to go to the country of Ten to work on a series of tasks for which he must get a permit from the Government of Ten. Once the permit is issued, Arun can enter the country within ten days of the date of issuance of the permit. Once Arun enters Ten, he can stay for a maximum of ten days. Each of the tasks has a priority, and takes a certain number of days to complete. Arun cannot work on more than one task at a time. The following table gives the details of the priority and the number of days required for each task.

Task	Priority	Number of Days Required
T <sub>1</sub>	1	3
T <sub>2</sub>	2	5
T <sub>3</sub>	5	3
T <sub>4</sub>	3	4
T <sub>5</sub>	4	2

Arun's first priority is to complete as many tasks as

possible, and then try to complete the higher priority tasks. His last priority is to go back as soon as possible. The tasks that Arun should try to complete are:

- (a) T<sub>1</sub> and T<sub>2</sub>                      (b) T<sub>1</sub>, T<sub>2</sub> and T<sub>5</sub>
- (c) T<sub>1</sub>, T<sub>4</sub> and T<sub>5</sub>                      (d) T<sub>1</sub>, T<sub>2</sub> and T<sub>4</sub>
- (e) T<sub>1</sub>, T<sub>3</sub> and T<sub>4</sub>

26. However, Arun's manager has told him to do some background research on the tasks before leaving for Ten. At the same time, there is no guarantee that the Government of Ten will give the permit to Arun. Background research involves substantial costs, and therefore Arun has decided that he will not start his background research without getting the permit.

The following table gives the details of the priority, the number of days required for each task and the number of days required for background research on each task.

Arun's first priority is to complete as many tasks as possible, and then try to complete the higher priority tasks. His last priority is to go back as soon as possible within ten days.

The tasks that Arun should try to complete are:

- (a) T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub>                      (b) T<sub>1</sub>, T<sub>2</sub> and T<sub>5</sub>
- (c) T<sub>1</sub>, T<sub>2</sub> and T<sub>4</sub>                      (d) T<sub>1</sub>, T<sub>3</sub> and T<sub>4</sub>
- (e) T<sub>1</sub>, T<sub>4</sub> and T<sub>5</sub>

## General Awareness

Task	Priority	Number of Days Required	No. of Days Required for Background Research
T1	1	3	3
T2	2	5	5
T3	5	3	2
T4	3	4	2
T5	4	2	3

*This section will not be used for determining cut off for interview and percentile but will be included for the final selection of XLRI admission. Other Associate Institute may also decide to use it at the time of interview and final selection.*

- Which of the followings are millennium development goals?
  - Poverty eradication, reducing child mortality, reducing trade barriers, combating AIDS
  - Poverty Reduction, environment sustainability, universal primary education, equal employment.
  - Reduce unemployment; promote diversity, combating malaria, improving maternal health
  - Globalization, reduction in poverty, combating AIDS, universal primary education
  - Poverty eradication, improving maternal health, universal primary education, combating AIDS
- Which of the following was not the reason for recent slide of Indian rupee?
  - Huge trade deficit
  - Low growth and High Inflation
  - Low Capital Inflow

- Burgeoning current account deficit
  - High unemployment rate
- Given below are some well-known awards and their respective fields. Choose the correct combination:
    - Palme d'Or–Television; Pulitzer–Advertising; Grammy–Music; Booker–Literature
    - Pulitzer–Advertising; Grammy–Music; Cannes Lions–Advertising; Booker–Literature
    - Grammy–Music; Booker–Journalism; Emmy–Television; Palme d'Or–Movies
    - Cannes Lions–Movie, Grammy–Music, Pulitzer–Journalism, Emmy–Television
    - Palme d'Or–Movie; Pulitzer–Journalism; Cannes Lions–Advertising, Booker–Literature

4. Read the following statements carefully:

- Excise duty is a tax on manufacture or production of goods and services
- Not all kinds of excise duty is collected by the Central Government in India
- Excise duty is an indirect tax

Which of the statements given above are correct?

- Statements I and II
- Statements II and III
- Statement I and III
- All of the above
- None of the above