MBA PIONEER 2024

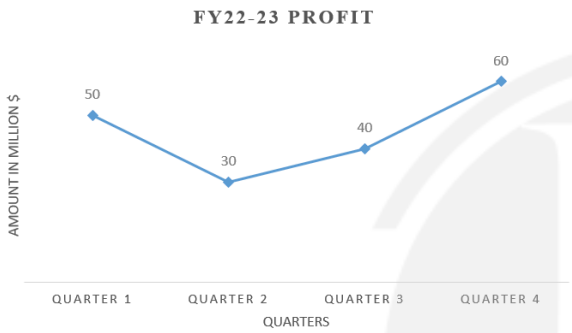
Data Interpretation & Logical Reasoning

DPP :04

Line Graphs

Directions (1-5) Read the following passage and answer the given questions.

The profit of a company in 4 quarters is as shown below. The ratio of profit and cost for Q1, Q2, Q3 & Q4 are 25: 12, 5: 7, 20: 9 and 2: 1 respectively.



Q1 What is the total revenue from all the four quarters combined (in $ Million)?

(A) 295 (B) 294

(C) 293 (D) 292

Q2 Quarter 2's revenue is what % more or less than the revenue of Quarter 4?

(A) 20% less (B) 20% more

(C) 25% less (D) 25% more

Q3 What is the total profit from those quarter(s) where the revenue is more than the quarterly average revenue(in $ Million)?

(A) 100 (B) 105

(C) 110 (D) 115

Q4 Total profit across all the quarters is what % of the total revenue?

(A) 60% (B) 58%

(C) 61% (D) 63%

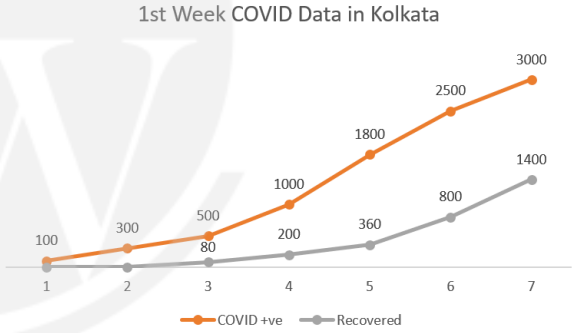
Q5 What is the total cost from the quarter(s) where the revenue is more than thrice the quarterly cost (in $ Million)?

(A) 40 (B) 41

(C) 42 (D) 43

Directions (6-10) Read the following passage and answer the given questions.

In Kolkata, the number of cumulative COVID Cases and recovery for the first week is shown in the diagram below. It takes 2 days from the detection date to either get recover or deceased. So, if a person is detected with COVID positive on day 1 will either get recovered or will be deceased on day 3.



Q6 What is the number of COVID +ve cases in Kolkata on 7th Day?

(A) 200 (B) 300

(C) 400 (D) 500

Q7 Find the number of people deceased who got detected COVID +ve on 3rd day?

(A) 420 (B) 80

(C) 40 (D) 20

Q8 Mortality rate on a day (D-2) is denoted as M and defined as

$$M = \frac{Number\ of\ People\ deceased\ on\ the\ day\ D}{Number\ of\ People\ who\ got\ diagnosed\ with\ covid\ on\ (D-2)} \times 100$$

Find the mortality rate on Day 3.

(A) 10% (B) 20%

(C) 40% (D) 30%

Q9 Mortality rate of which two dates are equal?

(A) Day 1 & 2 (B) Day 2 & 4

(C) Day 3 & 5 (D) Day 1 & 3

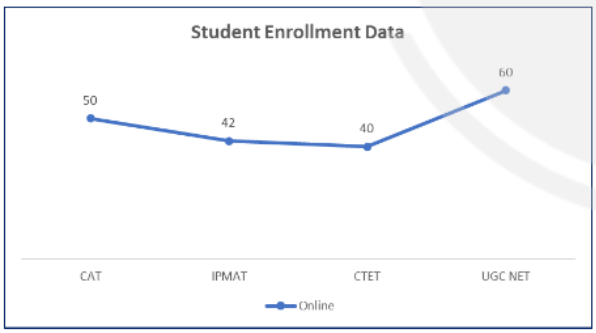
Q10 For which day the number of People deceased after being detected covid positive touched a 3-digit number for the first time?

(A) 5 (B) 4

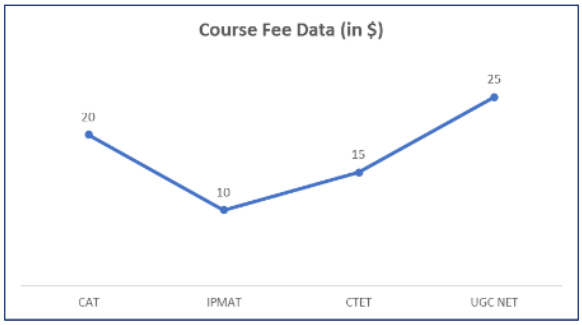
(C) 3 (D) 2

Directions (11-15) Read the following passage and answer the given questions.

An Ed-Tech company analysed the number of students enrolment across different exam categories and presented the data in the below format-



There are only two types of student enrolments – Online & Offline. The course price for Online courses are also shown below-



Further it is known that the ratio of offline & online course fees for CAT, IPMAT, CTET & UGC NET are 3:2, 2:1, 2:3 and 3:5 respectively. Also the ratio of online & offline enrolments CAT, IPMAT, CTET & UGC NET are 25 : 12, 7 : 5, 20 : 9 and 2 : 1 respectively.

Q11 Which segment gave the second highest revenue from the online enrolments?

(A) CAT (B) CTET

(C) IPMAT (D) UGC NET

Q12 The company is looking to shut the channel of the exam segment which generated the least revenue. Then which channel of which exam segment they can shut?

(A) CAT Online

(B) CTET Offline

(C) IPMAT Offline

(D) UGC NET Online.

Q13 What is the total revenue of the coaching intuition across all the courses and exam segment?

(A) $ 5250 (B) $ 5360

(C) $ 5470 (D) $ 5580

Q14 What is the total revenue of the coaching intuition across all the courses from online channel?

(A) $ 3410 (B) $ 3520

(C) $ 3630 (D) $ 3740

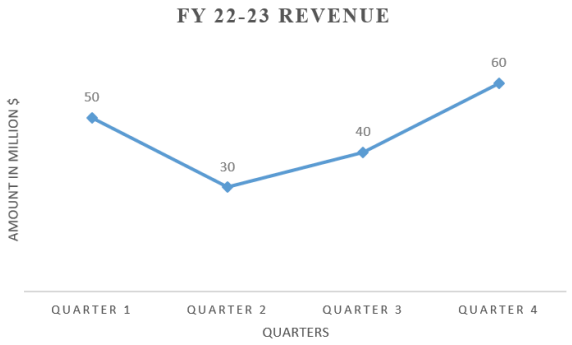
Q15 Had the Institution kept one fee for all the students across all the channels and exam category then how much more or less it could have earned had the one course rate been $20/student (in $)?

(A) $ 390 more (B) $ 410 less

(C) $390 less (D) $ 410 more

Directions (16-20) Read the following passage and answer the given questions.

ABC company analysed its financial data for the FY 22-23 and found the below graph-



The ratio of revenue and cost for Q1, Q2, Q3 & Q4 are 25 : 12, 5 : 7, 20 : 9 and 2 : 1 respectively. The revenue is coming from the sales of 4 products P1, P2, P3, P4 and their contribution is 20%, 30%, 40% & 10% of the revenue respectively in each of the quarters. The cost is coming only from the production and marketing of the 4 products P1, P2, P3, P4. The production cost is 66.67% of the total cost. The ratio of production cost of P1, P2, P3 & P4 is 1 : 2 : 2 : 1. The marketing cost is coming equally from P1, P2, P3 & P4. Profit is calculated as (Revenue – Cost).

Q16 What is the profit from Product P3 in Quarter 3?
(A) $9.5 Million (B) $10.5 Million
(C) $11.5 Million (D) $12.5 Million

Q17 What is the total profit from Product P1 in FY 22-23?
(A) $13 Million (B) $\$\frac{27}{2}$ Million
(C) $14 Million (D) $\$\frac{83}{6}$ Million

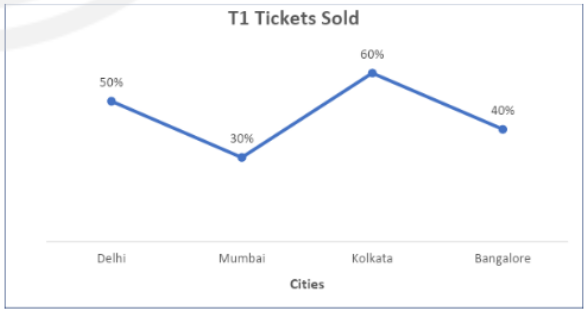
Q18 What is the ratio of profit from Product P1 and P2 in FY22-23?
(A) 81 : 112 (B) 83 : 115
(C) 88 : 113 (D) 92 : 117

Q19 Which product has been least profitable in the FY 22-23?
(A) P1 (B) P2
(C) P3 (D) P4

Q20 ABC company realised that the cost was wrongly calculated in one of the quarters where the digits (in $ Million) were interchanged. After correcting the error, the profit of the company in FY 22-23 increased by $18 Million. Then find the profit from the product in FY 22-23 which has the most contribution in revenue.
(A) $\$\frac{118}{5}$ Million (B) $\$\frac{109}{3}$ Million
(C) $\$\frac{128}{3}$ Million (D) $\$\frac{138}{5}$ Million

Directions (21-25) Read the following passage and answer the given questions.

Russel Peter, a famous stand-up comic artist had shows in 4 locations in India- Delhi, Mumbai, Kolkata, Bangalore. The shows in each of the locations happened in auditorium halls not necessarily having the same capacity across cities. There are 3 types of tickets which got sold in each of the locations- T1, T2 & T3 each having a different price but same across the cities. However, the cheapest ticket costs $1. The below graph shows the % of T1 sold in each of these cities. It is known that all the 4 shows across the 4 cities were housefull (which means total seating capacity of the hall is equal to the number of tickets sold). Number of T3 tickets sold in each of the locations are the same and are equal to 120 tickets/location. It is known that the ratio of costs of T1, T2 & T3 is 2 : 3 : 1. The ratio of T1 & T2 tickets for Delhi, Mumbai, Kolkata & Bangalore are in the ratio of 5 : 2, 3 : 4, 2 : 1, 1: 1 respectively.



Q21 Find the total revenue from all the shows across all the cities (in $).
(A) 4550 (B) 5560
(C) 6570 (D) 7580

Q22 Find the revenue of the city from T1 tickets which sold the least number of T2 tickets

(Answer in $).
(A) 300 (B) 350
(C) 400 (D) 450

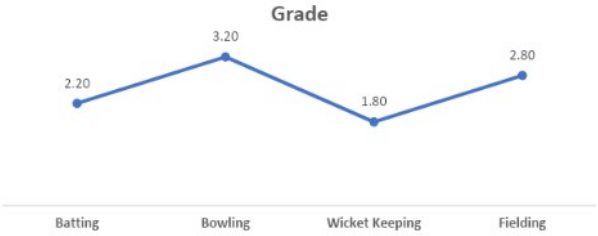
Q23 Find the revenue of the city from T2 tickets which sold the least number of T1 tickets (Answer in $).
(A) 400 (B) 460
(C) 480 (D) 500

Q24 Which city has the second lowest average cost/ticket for all the tickets sold?
(A) Delhi (B) Mumbai
(C) Kolkata (D) Bangalore

Q25 Cost of booking the auditorium halls in each of the cities is equal to the product of the number of seats and booking cost per seat. If the booking cost per seat is $0.50, then find the total profit from Kolkata (in $). Consider the auditorium booking cost as the only kind of cost.
(A) $1020 (B) $1040
(C) $2020 (D) $2040

Directions (26-30) Read the following passage and answer the given questions.

A Ranji cricket match was going on between two teams, these players didn't know that 5 national team selectors were speculating about Dhoni (one of the players playing with them). The names of selectors are A, B, C, D and E. Dhoni was graded by these 5 selectors on the following parameters: Batting, Bowling, wicket keeping and fielding from 1(lowest) to 4(highest). While grading Dhoni on four attributes, no selector gave the same grade to two attributes. The graph below shows the average grade of each of the attributes



The following table shows the attribute that was not given grade 1 or 4 by the selectors

A	Bowling, Wicket keeping
B	Bowling, Wicket keeping
C	Batting, Fielding
D	Batting, Fielding
E	Bowling, Wicket keeping

Further it is also known that:

- The attribute 'Wicket keeping' did not get the highest grade from any of the selectors.
- A and B gave the same grade to attribute Batting.

Q26 How many selectors gave a higher grade to 'Wicket keeping' than 'Bowling'?
(A) 0
(B) 1
(C) 2
(D) Cannot be determined

Q27 Which of the following could be an accurate list of grades given by A?
(A) Batting – 1, Bowling – 3, Wicket keeping – 2, Fielding – 4
(B) Batting – 4, Bowling – 3, Wicket keeping – 2, Fielding – 1
(C) Batting – 4, Bowling – 2, Wicket keeping – 3, Fielding – 1
(D) Both B) and C)

Q28 If for 'Wicket keeping', A graded higher than E, which of the following could be an accurate list of the grades given by B?

(A) Batting – 4, Bowling – 3, Wicket keeping – 2, Fielding – 1
(B) Batting – 1, Bowling – 3, Wicket keeping – 2, Fielding – 4
(C) Batting – 1, Bowling – 2, Wicket keeping – 3, Fielding – 4
(D) Both B) and C)

Q29 If E's grade were not considered, what would be the average grade received by attribute 'Fielding'?
(A) 2.5
(B) 2.6
(C) 3.25
(D) Either B) or C)

Q30 If A's grade were not considered, what would be the average grade received by attribute 'Batting?
(A) 2.5 (B) 2.6
(C) 2.25 (D) 3

Answer Key

Q1	(B)	Q16	(B)
Q2	(A)	Q17	(D)
Q3	(C)	Q18	(B)
Q4	(C)	Q19	(D)
Q5	(C)	Q20	(C)
Q6	(D)	Q21	(B)
Q7	(C)	Q22	(C)
Q8	(B)	Q23	(C)
Q9	(D)	Q24	(B)
Q10	(A)	Q25	(D)
Q11	(A)	Q26	(B)
Q12	(B)	Q27	(A)
Q13	(C)	Q28	(B)
Q14	(B)	Q29	(C)
Q15	(D)	Q30	(A)

Hints & Solutions

Q1. Text Solution:
Topic: Line Graphs

Total revenue = Profit + Cost
Profit from Q1 is \$50 Million.
The cost of Q1 will be \$50 Million$\times \frac{12}{25}$ = \$24 Million.
Similarly, we can find the cost for Q2, Q3, Q4 will be \$42 Million, \$18 Million and \$30 Million respectively.
So, the total revenue from Q1 = \$(50 + 24) Million = \$74 Million.
The total revenue from Q2 = \$(42 + 30) Million = \$72 Million.
The total revenue from Q3 = \$(40 + 18) Million = \$58 Million.
The total revenue from Q4 = \$(60 + 30) Million = \$90 Million.
Total revenue from the four quarters will be (\$74 + \$72 + \$58 + \$90) Million = \$294 Million.
The answer is option B.

Q2. Text Solution:
Topic: Line Graphs

The total revenue from Q2 = \$(42 + 30) Million = \$72 Million
The total revenue from Q4 = \$(60 + 30) Million = \$90 Million
Required % = (90 - 72) $\times \frac{100}{90}$ % = 20%.
Q2 revenue is 20% less than Q4 revenue.
The answer is option A.

Q3. Text Solution:
Topic: Line Graphs

Total revenue from the four quarters will be (\$74 + \$72 + \$58 + \$90) Million = \$294 Million
Quarterly average revenue = $\frac{294}{4}$ Million = \$73.5 Million.
Hence the revenue of Q1 & Q4 are more.
Thus, the total profit from Q1 & Q4 is (\$50 + \$60) Million = \$110 Million.
The answer is option C.

Q4. Text Solution:
Topic: Line Graphs

Total revenue from the four quarters will be (\$74 + \$72 + \$58 + \$90) Million = \$294 Million
Thus, the total profit from Q1, Q2, Q3 & Q4 is (\$50 + \$30 + \$40 + \$60) Million = \$180 Million.
Required Percentage = 180 $\times \frac{100}{294}$ % = 61.22% of the revenue.
The answer is option C.

Q5. Text Solution:
Topic: Line Graphs

Total revenue = Profit + Cost
Profit from Q1 is \$50 Million.
The cost of Q1 will be \$50 Million$\times \frac{12}{25}$ = \$24 Million.
Similarly, we can find the cost for Q2, Q3, Q4 will be \$42 Million, \$18 Million and \$30 Million respectively.
So, the total revenue from Q1 = \$(50 + 24) Million = \$74 Million
The total revenue from Q2 = \$(42 + 30) Million = \$72 Million
The total revenue from Q3 = \$(40 + 18) Million = \$58 Million
The total revenue from Q4 = \$(60 + 30) Million = \$90 Million
Total revenue from the four quarters will be (\$74 + \$72 + \$58 + \$90) Million = \$294 Million
Thrice of the Cost for Q1 and Q3 is less than the revenue of that quarter.
Thus, the sum of costs from the quarter(s) where the revenue is more than thrice the quarterly cost = (\$24 + \$18) Million = \$42 Million.
The answer is option C.

Q6. Text Solution:

Topic: Line Graphs

If a person is detected with COVID positive on day 1 will either recover or be deceased on day 3.

Day	Cumulative Cases (A)	Per Day Cases (B)	Cumulative Recovery (C)	Per Day Recovery (D)	Per Day Deceased (E)
1	100	100	--	--	--
2	300	200	--	--	--
3	500	200	80	80	20
4	1000	500	200	120	80
5	1800	800	360	160	40
6	2500	700	800	440	60
7	3000	500	1400	600	200

Number of COVID +ve cases in Kolkata on 7th Day = 500

The answer is option D.

Q7. Text Solution:

Topic: Line Graphs

If a person is detected with COVID positive on day 1 will either recover or be deceased on day 3.

Day	Cumulative Cases (A)	Per Day Cases (B)	Cumulative Recovery (C)	Per Day Recovery (D)	Per Day Deceased (E)
1	100	100	--	--	--
2	300	200	--	--	--
3	500	200	80	80	20
4	1000	500	200	120	80
5	1800	800	360	160	40
6	2500	700	800	440	60
7	3000	500	1400	600	200

The person detected on the 3rd day will either recover or be deceased on the 5th day.

The number of people who deceased and got detected on 3rd day is 40

The answer is option C.

Q8. Text Solution:

Topic: Line Graphs

If a person is detected with COVID positive on day 1 will either recover or be deceased on day 3.

Day	Cumulative Cases (A)	Per Day Cases (B)	Cumulative Recovery (C)	Per Day Recovery (D)	Per Day Deceased (E)
1	100	100	--	--	--
2	300	200	--	--	--
3	500	200	80	80	20
4	1000	500	200	120	80
5	1800	800	360	160	40
6	2500	700	800	440	60
7	3000	500	1400	600	200

Here, D-2 = 3

So, D = 5

Mortality rate on day 3 = $\frac{Deceased\ on\ Day\ 5}{People\ diagnosed\ on\ Day\ 3} \times 100$

= $\frac{40}{200} \times 100$

= 20%

The answer is option B.

Q9. Text Solution:

Topic: Line Graphs

If a person is detected with COVID positive on day 1 will either recover or be deceased on day 3.

Day	Cumulative Cases (A)	Per Day Cases (B)	Cumulative Recovery (C)	Per Day Recovery (D)	Per Day Deceased (E)
1	100	100	--	--	--
2	300	200	--	--	--
3	500	200	80	80	20
4	1000	500	200	120	80
5	1800	800	360	160	40
6	2500	700	800	440	60

7	3000	500	1400	600	200

Mortality of different days are:

Day 1 = $\frac{Deceased\ on\ Day\ 3}{People\ diagnosed\ on\ Day\ 1} \times 100 = \frac{20}{100} \times 100$ = 20%

Day 2 = $\frac{Deceased\ on\ Day\ 4}{People\ diagnosed\ on\ Day\ 2} \times 100 = \frac{80}{200} \times 100$ = 40%

Day 3 = $\frac{Deceased\ on\ Day\ 5}{People\ diagnosed\ on\ Day\ 3} \times 100 = \frac{40}{200} \times 100$ = 20%

Day 4 = $\frac{Deceased\ on\ Day\ 6}{People\ diagnosed\ on\ Day\ 4} \times 100 = \frac{60}{500} \times 100$ = 12%

Day 5 = $\frac{Deceased\ on\ Day\ 7}{People\ diagnosed\ on\ Day\ 5} \times 100 = \frac{200}{800} \times 100$ = 25%

So, the mortality rate of day 1 & 3 are the same.

The answer is option D.

Q10. Text Solution:

Topic: Line Graphs

If a person is detected with COVID positive on day 1 will either recover or be deceased on day 3.

Day	Cumulative Cases (A)	Per Day Cases (B)	Cumulative Recovery (C)	Per Day Recovery (D)	Per Day Deceased (E)
1	100	100	--	--	--
2	300	200	--	--	--
3	500	200	80	80	20
4	1000	500	200	120	80
5	1800	800	360	160	40
6	2500	700	800	440	60
7	3000	500	1400	600	200

As we can see from the data, the number of people detected on day 5 and who deceased on day 7 is 200. Thus, day 5 is the answer.

The answer is option A.

Q11. Text Solution:

Topic: Line Graphs

The revenue from a particular category = Online Enrolment Revenue + Offline Enrolment Revenue.

Revenue from any category = Number of students enrolled in the category × Course Fee.

Example-

Total revenue from CAT online = 50 x $20 = $1000.

Analysing the data in the 2 line charts we can analyse the data using the below table-

	Students Enrolment		**Course Fee**		**Revenue**		
Exam Segment	**Online**	**Offline**	**Online**	**Offline**	**Online**	**Offline**	**Total Cost**
CAT	50	24	$20	$30	$1,000	$720	$ 1,720
IPMAT	42	30	$10	$20	$420	$600	$ 1,020
CTET	40	18	$15	$10	$600	$180	$ 780
UGC NET	60	30	$25	$15	$1,500	$450	$ 1,950
Total	**192**	**102**			**$ 3520**	**$ 1950**	**$ 5470**

As we can see from the table, the second-highest revenue is coming from the **CAT** segment.

The answer is option A.

Q12. Text Solution:

Topic: Line Graphs

The revenue from a particular category = Online Enrolment Revenue + Offline Enrolment Revenue.

Revenue from any category = Number of students enrolled in the category × Course Fee.

Example-

Total revenue from CAT online = 50 x $20 = $1000.

Analysing the data in the 2 line charts we can analyse the data using the below table-

	Students Enrolment	**Course Fee**	**Revenue**	

Exam Segment	Online	Offline	Online	Offline	Online	Offline	Total Cost
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CTET	40	18	$15	$10	$600	$180	$780
UGC NET	60	30	$25	$15	$1,500	$450	$1,950
Total	**192**	**102**			**$3520**	**$1950**	**$5470**

The least revenue is coming from the **CTET** segment's Offline Channel.

The answer is option B.

Q13. Text Solution:
Topic: Line Graphs

The revenue from a particular category = Online Enrolment Revenue + Offline Enrolment Revenue.
Revenue from any category = Number of students enrolled in the category × Course Fee.
Example-
Total revenue from CAT online = 50 x $20 = $1000.
Analysing the data in the 2 line charts we can analyse the data using the below table-

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CTET	40	18	$15	$10	$600	$180	$780
UGC NET	60	30	$25	$15	$1,500	$450	$1,950
Total	**192**	**102**			**$3520**	**$1950**	**$5470**

Total revenue from all the courses and all the exam segments is 3520 + 1950 = **$5470**.

The answer is option C.

Q14. Text Solution:
Topic: Line Graphs

The revenue from a particular category = Online Enrolment Revenue + Offline Enrolment Revenue.
Revenue from any category = Number of students enrolled in the category × Course Fee.
Example-
Total revenue from CAT online = 50 x $20 = $1000.
Analysing the data in the 2 line charts we can analyse the data using the below table-

	Students Enrolment		Course Fee		Revenue		
Exam Segment	**Online**	**Offline**	**Online**	**Offline**	**Online**	**Offline**	**Total Cost**
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CTET	40	18	$15	$10	$600	$180	$780
UGC NET	60	30	$25	$15	$1,500	$450	$1,950
Total	**192**	**102**			**$3520**	**$1950**	**$5470**

The total revenue of the coaching intuition across all the courses from the online channel is **$ 3520**.

The answer is option B.

Q15. Text Solution:
Topic: Line Graphs

The revenue from a particular category = Online Enrolment Revenue + Offline Enrolment Revenue.
Revenue from any category = Number of students enrolled in the category × Course Fee.
Example-
Total revenue from CAT online = 50 x $20 = $1000.
Analysing the data in the 2 line charts we can analyse the data using the below table-

	Students Enrolment		Course Fee		Revenue		
Exam Segment	**Online**	**Offline**	**Online**	**Offline**	**Online**	**Offline**	**Total Cost**
CAT	50	24	$20	$30	$1,000	$720	$1,720
IPMAT	42	30	$10	$20	$420	$600	$1,020
CTET	40	18	$15	$10	$600	$180	$780
UGC NET	60	30	$25	$15	$1,500	$450	$1,950
Total	**192**	**102**			**$3520**	**$1950**	**$5470**

Had the rate been $20 for all the courses then the total revenue been $(192 + 102) x 20 = $5880.
So, they would have earned ($5880 - $5470) = **$410 more**.
The answer is option D.

Q16. Text Solution:
Topic: Line Graphs

The revenue in Quarter Q3 is $40 Million. The contribution of P3 in revenue is ($40 Million× 40%) = $16 Million.
The cost in Quarter 3 is $18 Million. The contribution of production cost in the cost is $18 Million $\times \frac{2}{3}$ = $12 Million.
The total production cost of P3 in Q3 is $\left(12 \times \frac{2}{6}\right)$ Million = $4 Million.
Total marketing cost in Q3 is ($18 - $12) Million = $6 Million.
So, the contribution of P3 in Marketing Cost is $\frac{\$6\ Million}{4}$ = $1.5 Million.
Total cost for P3 in Q3 is ($4 + $1.5) Million = $5.5 Million.
So, the profit from P3 is ($16 - $5.5) Million = $10.5 Million.
The answer is option B.

Q17. Text Solution:
Topic: Line Graphs

Total revenue in the 4 quarters is ($50 + $30+ $40 + $60) Million = $180 Million.
The contribution of P1 in the revenue is ($180× 20%) = $36 Million.
Thus, the total cost across all the quarters is ($24 + $42 + $18 + $30) Million = $114 Million
Production cost of P1 = $114 $\times \frac{2}{3} \times \frac{1}{6}$ Million = $ $\frac{38}{3}$ Million
Marketing cost of P1 = $114 $\times \frac{1}{3} \times \frac{1}{4}$= $ $\frac{19}{2}$ Million
Total profit of P1 = $36 - $$\frac{38}{3}$ - $$\frac{19}{2}$ Million = $$\frac{83}{6}$ Million
The answer is option D.

Q18. Text Solution:
Topic: Line Graphs

Total revenue in the 4 quarters is ($50 + $30+ $40 + $60) Million = $180 Million.
The contribution of P1 in the revenue is ($180 × 20%) = $36 Million.
Thus, the total cost across all the quarters is ($24 + $42 + $18 + $30) Million = $114 Million
Production cost of P1 = $114 $\times \frac{2}{3} \times \frac{1}{6}$ Million = $ $\frac{38}{3}$ Million
Marketing cost of P1 = $114 $\times \frac{1}{3} \times \frac{1}{4}$ = $ $\frac{19}{2}$ Million
Total profit of P1 = $36 - $ $\frac{38}{3}$ - $ $\frac{19}{2}$ Million = $ $\frac{83}{6}$ Million
The contribution of P2 in the revenue = $180 × 30% = $54 Million.

Production cost of P2 = \$114 $\times \frac{2}{3} \times \frac{1}{3}$ Million = \$ $\frac{76}{3}$ Million

Marketing cost of P2 = \$114 $\times \frac{1}{3} \times \frac{1}{4}$ = \$ $\frac{19}{2}$ Million

Total profit of P2 = \$54 - \$$\frac{76}{3}$ - \$$\frac{19}{2}$ Million = \$ $\frac{115}{6}$ Million

Thus the ratio of profit is P1 and P2 is 83: 115.

The answer is option B.

Q19. Text Solution:

Topic: Line Graphs

Total revenue in the 4 quarters is (\$50 + \$30+ \$40 + \$60) Million = \$180 Million.

The contribution of P1 in the revenue is (\$180$\times$ 20%) = \$36 Million.

Thus, the total cost across all the quarters is (\$24 + \$42 + \$18 + \$30) Million = \$114 Million

Production cost of P1 = 114 $\times \frac{2}{3} \times \frac{1}{6}$ Million = \$ $\frac{38}{3}$ Million

Marketing cost of P1 = 114 $\times \frac{1}{3} \times \frac{1}{4}$ = \$ $\frac{19}{2}$ Million

Total profit of P1 = 36 - $\frac{38}{3}$ - $\frac{19}{2}$ Million = \$ $\frac{83}{6}$ Million

The contribution of P2 in the revenue = 180$\times$ 30% = \$54 Million.

Production cost of P2 = 114 $\times \frac{2}{3} \times \frac{1}{3}$ Million = \$ $\frac{76}{3}$ Million

Marketing cost of P2 = 114 $\times \frac{1}{3} \times \frac{1}{4}$ = \$ $\frac{19}{2}$ Million

Total profit of P2 = 54 - $\frac{76}{3}$ - $\frac{19}{2}$ Million = \$ $\frac{115}{6}$ Million

The contribution of P3 in the revenue = 180 $\times$ 40% = \$72 Million.

Production cost of P3 = 114 $\times \frac{2}{3} \times \frac{1}{3}$ Million = \$ $\frac{76}{3}$ Million

Marketing cost of P3 = 114$\times \frac{1}{3} \times \frac{1}{4}$ = \$$\frac{19}{2}$ Million

Total profit of P3 = 72 - $\frac{76}{3}$ - $\frac{19}{2}$ Million = \$ $\frac{223}{6}$ Million

The contribution of P4 in the revenue = 180$\times$ 10% = \$18 Million.

Production cost of P4 = 114 $\times \frac{2}{3} \times \frac{1}{6}$ Million = \$ $\frac{38}{3}$Million

Marketing cost of P4 = 114 $\times \frac{1}{3} \times \frac{1}{4}$= \$$\frac{19}{2}$ Million

Total profit of P4 = 18 - $\frac{38}{3}$ - $\frac{19}{2}$ Million = \$ - $\frac{25}{6}$ Million

Thus, P4 is the least profitable product.

The answer is option D.

Q20. Text Solution:

Topic: Line Graphs

After changing the cost with the correct number in one of the quarters, the profit increased by \$18 Million. It means that the cost is reduced by \$18 Million. So the ten's digit of the number should be more than the unit's digit number in the wrongly reported cost. Also, the difference should be 2.

Thus, the number is \$42 Million.

So, Quarter 2's number is wrongly written as \$42 Million and it should be \$24 Million.

The product whose revenue contribution is the highest is P3.

The contribution of P3 in the revenue = 180 $\times$ 40% = \$72 Million.

Production cost of P3 = 96 $\times \frac{2}{3} \times \frac{1}{3}$ = \$$\frac{64}{3}$ Million

Marketing cost of P3 = 96 $\times \frac{1}{3} \times \frac{1}{4}$= \$8 Million

Total profit of P3 = 72 - $\frac{64}{3}$- 8 = \$ $\frac{128}{3}$ Million

The answer is option C.

Q21. Text Solution:

Topic: Line Graphs

The number of T3 tickets sold in each of the locations were the same and is equal to 120/location.

In Delhi, 50% of the tickets T1 was and the ratio of tickets sold for T1 and T2 in Delhi is 5 : 2.

5x = 50%

x = 10% then 2x = 20%.

T3 = 100 - 50 - 20 = 30%

So, the total number of seats in Delhi = $\frac{120}{30}$% = 400

Similarly we can find for all locations,

Number of seats in Mumbai is $\frac{120}{30}$% = 400

Number of seats in Kolkata is $\frac{120}{10}$% = 1200

Number of seats in Bangalore is $\frac{120}{20}$% = 600

The below ticket can be obtained by splitting the total tickets into T1, T2 & T3.

Location	Total Tickets	T1	T2	T3
Delhi	400	200	80	120
Mumbai	400	120	160	120
Kolkata	1200	720	360	120
Bangalore	600	240	240	120

The cheapest ticket is T3 which has a price of $1.

The cost of T1 = $2, T2 = $3.

Now multiplying the seat counts with the seat price we can get the total revenue.

So, the updated table looks like this-

		Seat Count			Revenue			
Location	**Total Tickets**	**T1**	**T2**	**T3**	**T1**	**T2**	**T3**	**City Total**
Delhi	400	200	80	120	$ 400	$ 240	$ 120	$ 760
Mumbai	400	120	160	120	$ 240	$ 480	$ 120	$ 840
Kolkata	1200	720	360	120	$ 1,440	$ 1,080	$ 120	$ 2,640
Bangalore	600	240	240	120	$ 480	$ 720	$ 120	$ 1,320
Total	**2600**	**1280**	**840**	**480**	**$ 2,560**	**$ 2,520**	**$ 480**	**$ 5,560**

Thus, the total revenue is **$5560**.

The answer is option B.

Q22. Text Solution:

Topic: Line Graphs

We can calculate the average cost/ticket by dividing the total cost of ticket in a city by the total number of tickets sold in that city.

		Seat Count	Revenue		

Location	Total Tickets	T1	T2	T3	T1	T2	T3	City Total	Avg Price /Ticket
Delhi	400	200	80	120	$ 400	$ 240	$ 120	$ 760	$ 1.90
Mumbai	400	120	160	120	$ 240	$ 480	$ 120	$ 840	$ 2.10
Kolkata	1200	720	360	120	$ 1,440	$ 1,080	$ 120	$ 2,640	$2.20
Bangalore	600	240	240	120	$ 480	$ 720	$ 120	$ 1,320	$2.20
Total	**2600**	**1280**	**840**	**480**	**$ 2,560**	**$ 2,520**	**$ 480**	**$ 5,560**	

Delhi sold the minimum number of T2 tickets. So, it's sale from the T1 tickets is **$400**.

The answer is option C.

Q23. Text Solution:

Topic: Line Graphs

We can calculate the average cost/ticket by dividing the total cost of ticket in a city by the total number of tickets sold in that city.

		Seat Count			Revenue				
Location	**Total Tickets**	**T1**	**T2**	**T3**	**T1**	**T2**	**T3**	**City Total**	**Avg Price /Ticket**
Delhi	400	200	80	120	$ 400	$ 240	$ 120	$ 760	$ 1.90
Mumbai	400	120	160	120	$ 240	$ 480	$ 120	$ 840	$ 2.10

Kolkata	1200	720	360	120	$ 1,440	$ 1,080	$ 120	$ 2,640	$2.20
Bangalore	600	240	240	120	$ 480	$ 720	$ 120	$ 1,320	$2.20
Total	**2600**	**1280**	**840**	**480**	**$ 2,560**	**$ 2,520**	**$ 480**	**$ 5,560**	

Mumbai sold the minimum number of T1 tickets.
So, it's sale from the T2 tickets is **$480**.
The answer is option C.

Q24. **Text Solution:**
Topic: Line Graphs

We can calculate the average cost/ticket by dividing the total cost of a ticket in a city by the total number of tickets sold in that city.

		Seat Count			Revenue				
Location	**Total Tickets**	**T1**	**T2**	**T3**	**T1**	**T2**	**T3**	**City Total**	**Avg Price /Ticket**
Delhi	400	200	80	120	$ 400	$ 240	$ 120	$ 760	$ 1.90
Mumbai	400	120	160	120	$ 240	$ 480	$ 120	$ 840	$ 2.10
Kolkata	1200	720	360	120	$ 1,440	$ 1,080	$ 120	$ 2,640	$2.20
Bangalore	600	240	240	120	$ 480	$ 720	$ 120	$ 1,320	$2.20
Total	**2600**	**1280**	**840**	**480**	**$ 2,560**	**$ 2,520**	**$ 480**	**$ 5,560**	

As seen from the table, **Mumbai** has the second lowest average price/ticket.

The answer is option B.

Q25. **Text Solution:**
Topic: Line Graphs

We can calculate the average cost/ticket by dividing the total cost of ticket in a city by the total number of tickets sold in that city.

		Seat Count			Revenue				
Location	**Total Tickets**	**T1**	**T2**	**T3**	**T1**	**T2**	**T3**	**City Total**	**Avg Price /Ticket**
Delhi	400	200	80	120	$ 400	$ 240	$ 120	$ 760	$ 1.90
Mumbai	400	120	160	120	$ 240	$ 480	$ 120	$ 840	$ 2.10
Kolkata	1200	720	360	120	$ 1,440	$ 1,080	$ 120	$ 2,640	$2.20
Bangalore	600	240	240	120	$ 480	$ 720	$ 120	$ 1,320	$2.20
Total	**2600**	**1280**	**840**	**480**	**$ 2,560**	**$ 2,520**	**$ 480**	**$ 5,560**	

Total cost of booking auditorium in Kolkata is 1200 $0.5 = $600.
So, the total profit from Kolkata is $2640 - $600 = **$2040**.
The answer is option D.

Q26. **Text Solution:**
Topic: Line Graphs

Inference from the graph –
The graph gives the average grade for each attribute given by the five selectors. We can calculate the total that each has got.
Batting = 2.2 x 5 = 11

Bowling = 3.2 x 5 = 16
Wicket keeping = 1.8 x 5 = 9
Fielding = 2.8 x 5 = 14
Inference from the table –
The table gives the list of attributes that were not marked 1 or 4 by selectors. That would mean that it is the list of what they marked 2 or 3.
Following inference can be drawn:

	Batting	Bowling	Wicket keeping	Fielding
A	1/4	2/3	3/2	4/1
B	1/4	2/3	3/2	4/1
C	2/3	1/4	4/1	3/2
D	2/3	1/4	4/1	3/2
E	1/4	2/3	3/2	4/1
Total	11	16	9	14

Inference from additional condition:
Condition: The attribute 'Wicket keeping' did not get the highest grade from any of the selectors.
That would mean that Wicket keeping cannot get 4.
The table can be refined as –

	Batting	Bowling	Wicket keeping	Fielding
A	1/4	2/3	3/2	4/1
B	1/4	2/3	3/2	4/1
C	2/3	4	1	3/2
D	2/3	4	1	3/2
E	1/4	2/3	3/2	4/1
Total	11	16	9	14

Wicket keeping = A + B + C + D + E = 9
Since, C = D = 1
A + B + E = 7, where A, B and E are either 2 or 3.
There is only one possibility 3 + 2 + 2 = 7
Bowling = A + B + C + D + E = 16
Since, C = D = 4
A + B + E = 8, where A, B and E are either 2 or 3.
There is only one possibility 2 + 3 + 3 = 8
So, the table for wicket keeping and bowling would be –

	Bowling	Wicket keeping
A/B/E	2	3
A/B/E	3	2
C	4	1
D	4	1
A/B/E	3	2
Total	16	9

1 selector gave a higher grade to wicketkeeping than bowling.
Option B is the answer.

Q27. Text Solution:
Topic: Line Graphs

Inference from the graph –
The graph gives the average grade for each attribute given by the five selectors. We can calculate the total that each has got.
Batting = 2.2 × 5 = 11
Bowling = 3.2 × 5 = 16
Wicket keeping = 1.8 × 5 = 9
Fielding = 2.8 × 5 = 14
Inference from the table –
The table gives the list of attributes that were not marked 1 or 4 by selectors. That would mean that it is the list of what they marked 2 or 3.
Following inference can be drawn:

	Batting	Bowling	Wicket keeping	Fielding
A	1/4	2/3	3/2	4/1
B	1/4	2/3	3/2	4/1
C	2/3	1/4	4/1	3/2

D	2/3	1/4	4/1	3/2
E	1/4	2/3	3/2	4/1
Total	11	16	9	14

Inference from additional condition:

Condition: The attribute 'Wicket keeping' did not get the highest grade from any of the selectors.

That would mean that Wicket keeping cannot get 4.

The table can be refined as –

	Batting	Bowling	Wicket keeping	Fielding
A	1/4	2/3	3/2	4/1
B	1/4	2/3	3/2	4/1
C	2/3	4	1	3/2
D	2/3	4	1	3/2
E	1/4	2/3	3/2	4/1
Total	11	16	9	14

Wicket keeping = A + B + C + D + E = 9

Since, C = D = 1

A + B + E = 7, where A B and E is either 2 or 3.

There is only one possibility 3 + 2 + 2 = 7

Bowling = A + B + C + D + E = 16

Since, C = D = 4

A + B + E = 8, where A B and E is either 2 or 3.

There is only one possibility 2 + 3 + 3 = 8

So, the table for wicket keeping and bowling would be –

	Bowling	Wicket keeping
A/B/E	2	3
A/B/E	3	2
C	4	1
D	4	1
A/B/E	3	2
Total	16	9

Condition: A and B gave the same grade to attribute Batting.

First, let us get a handle of the grades of batting.

	Batting
A	1/4
B	1/4
C	2/3
D	2/3
E	1/4
Total	11

Since A and B gave the same grade to attribute Batting, either A = B = 1 OR A = B = 4.

Now, if A = B = 4, then

A + B + C + D + E = 11

A + B = 4 + 4 = 8

C + D + E = 3, that would be C = D = E = 1, which is not possible.

So, A = B = 1

Therefore, A must grade batting as 1. That eliminates option B), C) and D).

Q28. Text Solution:

Topic: Line Graphs

Inference from the graph –

The graph gives the average grade for each attribute given by the five selectors. We can calculate the total that each has got.

Batting = 2.2 x 5 = 11

Bowling = 3.2 x 5 = 16

Wicket keeping = 1.8 x 5 = 9

Fielding = 2.8 x 5 = 14

Inference from the table –

The table gives the list of attributes that were not marked 1 or 4 by selectors. That would mean that it is the list of what they marked 2 or 3.

Following inference can be drawn:

	Batting	Bowling	Wicket keeping	Fielding

			g	
A	1/4	2/3	3/2	4/1
B	1/4	2/3	3/2	4/1
C	2/3	1/4	4/1	3/2
D	2/3	1/4	4/1	3/2
E	1/4	2/3	3/2	4/1
Total	11	16	9	14

Inference from additional condition:

Condition: The attribute 'Wicket keeping' did not get the highest grade from any of the selectors.

That would mean that Wicket keeping cannot get 4.

The table can be refined as –

	Batting	Bowling	Wicket keeping	Fielding
A	1/4	2/3	3/2	4/1
B	1/4	2/3	3/2	4/1
C	2/3	4	1	3/2
D	2/3	4	1	3/2
E	1/4	2/3	3/2	4/1
Total	11	16	9	14

Wicket keeping = A + B + C + D + E = 9

Since, C = D = 1

A + B + E = 7, where A B and E are either 2 or 3.

There is only one possibility 3 + 2 + 2 = 7

Bowling = A + B + C + D + E = 16

Since, C = D = 4

A + B + E = 8, where A B and E are either 2 or 3.

There is only one possibility 2 + 3 + 3 = 8

So, the table for wicket keeping and bowling would be –

	Bowling	Wicket keeping
A/B/E	2	3
A/B/E	3	2
C	4	1
D	4	1
A/B/E	3	2
Total	16	9

A and B's grade for Batting is 1. There are two options that satisfy that condition. We cannot be sure of the answer.

We infer the following –

	Bowling	Wicket keeping
A/B/E	2	3
A/B/E	3	2
C	4	1
D	4	1
A/B/E	3	2
Total	16	9

	Batting	Fielding
A	1	4
B	1	4
C/D	2	3
D/C	3	2
E	4	1
Total	11	14

Combining the above two tables –

	Batting	Bowling	Wicket keeping	Fielding
A	1	2/3	3/2	4
B	1	2/3	3/2	4
C	2/3	4	1	3/2

D	3/2	4	1	2/3
E	1	2/3	3/2	4
Total	11	16	9	14
Values		(2, 3, 3, 4, 4)	(1, 1, 2, 2 3)	

Wicket keeping: A graded higher than E

That would mean that A graded 3 and E graded 2. Now, since for Wicket keeping the possible values are (1, 1, 2, 2, 3)

B must grade 2 for Wicket keeping.

So, the grade of B would be:

Batting – 1, Bowling – 3, Wicket keeping – 2, Fielding – 4

Option **B** is the answer.

Q29. Text Solution:

Topic: Line Graphs

Inference from the graph –

The graph gives the average grade for each attribute given by the five selectors. We can calculate the total that each has got.

Batting = 2.2 x 5 = 11

Bowling = 3.2 x 5 = 16

Wicket keeping = 1.8 x 5 = 9

Fielding = 2.8 x 5 = 14

Inference from the table –

The table gives the list of attributes that were not marked 1 or 4 by selectors. That would mean that it is the list of what they marked 2 or 3.

Following inference can be drawn:

	Batting	Bowling	Wicket keeping	Fielding
A	1/4	2/3	3/2	4/1
B	1/4	2/3	3/2	4/1
C	2/3	1/4	4/1	3/2
D	2/3	1/4	4/1	3/2
E	1/4	2/3	3/2	4/1
Total	11	16	9	14

Inference from additional condition:

Condition: The attribute 'Wicket keeping' did not get the highest grade from any of the selectors.

That would mean that Wicket keeping cannot get 4.

The table can be refined as –

	Batting	Bowling	Wicket keeping	Fielding
A	1/4	2/3	3/2	4/1
B	1/4	2/3	3/2	4/1
C	2/3	4	1	3/2
D	2/3	4	1	3/2
E	1/4	2/3	3/2	4/1
Total	11	16	9	14

Wicket keeping = A + B + C + D + E = 9

Since, C = D = 1

A + B + E = 7, where A B and E are either 2 or 3.

There is only one possibility 3 + 2 + 2 = 7

Bowling = A + B + C + D + E = 16

Since, C = D = 4

A + B + E = 8, where A, B and E are either 2 or 3.

There is only one possibility 2 + 3 + 3 = 8

So, the table for wicket keeping and bowling would be –

	Bowling	Wicket keeping
A/B/E	2	3
A/B/E	3	2
C	4	1
D	4	1

A/B/E	3	2
Total	16	9

Since A = B = 1, A + B = 2

C + D + E = 9

Given that C = 2 or 3; D = 2 or 3 and E = 1 or 4, the only combination that will get us to 9 is 2 + 3 + 4 = 9

	Batting
A	1
B	1
C/D	2
D/C	3
E	4
Total	11

The above will give the accurate list for fielding

	Batting	Fielding
A	1	4
B	1	4
C/D	2	3
D/C	3	2
E	4	1
Total	11	14

Since E's grade is discredited, the new total of Fielding would be 13.

Average = $\frac{13}{4}$ = 3.25.

Option C is the answer.

Q30. Text Solution:

Topic: Line Graphs

Inference from the graph –

The graph gives the average grade for each attribute given by the five selectors. We can calculate the total that each has got.

Batting = 2.2 x 5 = 11

Bowling = 3.2 x 5 = 16

Wicket keeping = 1.8 x 5 = 9

Fielding = 2.8 x 5 = 14

Inference from the table –

The table gives the list of attributes that were not marked 1 or 4 by selectors. That would mean that it is the list of what they marked 2 or 3.

Following inference can be drawn:

	Batting	Bowling	Wicket keeping	Fielding
A	1/4	2/3	3/2	4/1
B	1/4	2/3	3/2	4/1
C	2/3	1/4	4/1	3/2
D	2/3	1/4	4/1	3/2
E	1/4	2/3	3/2	4/1
Total	11	16	9	14

Inference from additional condition :

Condition: The attribute 'Wicket keeping' did not get the highest grade from any of the selectors.

That would mean that Wicket keeping cannot get 4.

The table can be refined as –

	Batting	Bowling	Wicket keeping	Fielding
A	1/4	2/3	3/2	4/1
B	1/4	2/3	3/2	4/1
C	2/3	4	1	3/2
D	2/3	4	1	3/2
E	1/4	2/3	3/2	4/1
Total	11	16	9	14

Wicket keeping = A + B + C + D + E = 9

Since, C = D = 1

A + B + E = 7, where A , B and E are either 2 or 3.

There is only one possibility 3 + 2 + 2 = 7

Bowling = A + B + C + D + E = 16

Since, C = D = 4

A + B + E = 8, where A, B and E are either 2 or 3.

There is only one possibility 2 + 3 + 3 = 8

So, the table for wicket keeping and bowling would be –

	Bowling	Wicket keeping
A/B/E	2	3
A/B/E	3	2
C	4	1
D	4	1
A/B/E	3	2
Total	16	9

Since A = B = 1, A + B = 2

C + D + E = 9

Given that C = 2 or 3; D = 2 or 3 and E = 1 or 4, the only combination that will get us to 9 is 2 + 3 + 4 = 9

	Batting
A	1
B	1
C/D	2
D/C	3
E	4
Total	11

The above will give the accurate list for Batting,

	Batting	Fielding
A	1	4
B	1	4
C/D	2	3
D/C	3	2
E	4	1
Total	11	14

Thus, the answer is $\frac{11-1}{4}$ = 2.5.

Option A is the answer.