MBA PIONEER 2024

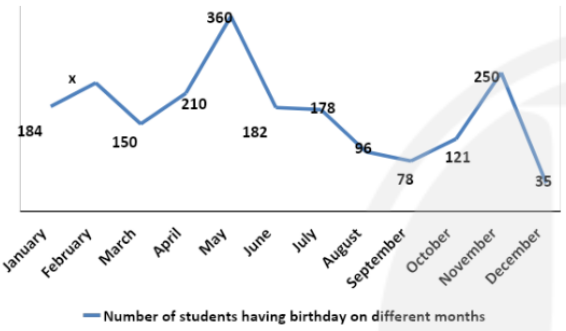
Data Interpretation & Logical Reasoning

DPP: 08

Multiple Charts

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

There are 2100 students in a college and they all have their birthday in one of the twelve months of a year. The line graph given below shows the number of students having birthday on different months a year.



The table given below shows the ratio of the number of boys to girls having birthday on first six months of a year

Month	Ratio of number of boys to number of girls
January	13: 10
February	7: 9
March	3: 2
April	4: 3
May	7: 11
June	9: 5

Q1 Find the difference between the numbers of boys who have birthdays in January to that of February.

(A) 6 (B) 8

(C) 12 (D) 14

Q2 Find the average number of girls who have birthdays in January, March, April, May and June.

(A) 97 (B) 93

(C) 107 (D) 103

Q3 If the average money spent on a birthday party by each of the students who have birthdays in September and October is Rs. 48 and Rs. 22, respectively, then find the difference between the total money spent on a party by all the students who have birthdays in September and that of October.

(A) Rs 1082 (B) Rs 1162

(C) RS 964 (D) Rs 1246

Q4 If the ratio of the number of boys to girls who have birthdays in November and December is 13:12 and 2:3, respectively, then find the total number of girls who have birthday in November and December combined.

(A) 145 (B) 139

(C) 151 (D) None of these

Q5 If 25% of the students who have birthdays in August are girls and out of these girls, 7 are from the Science department, then find the number of girls from other departments than Science who have birthdays in August.

(A) 15 (B) 16

(C) 17 (D) 18

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

At a toll plaza there are five lanes P, Q, R, S, and T at which vehicles can pass through the plaza.

Note 1: Vehicles passed are either 2 wheelers or 4 wheelers.

Note 2: Toll tax for each 2 - wheelers vehicle is Rs.180 and toll tax for each 4 - wheelers vehicle is Rs.240.

Pie chart given below shows the percent distribution of total vehicles passed from the toll plaza at different lanes on a particular day.

Total vehicles passed from different lanes of the toll plaza

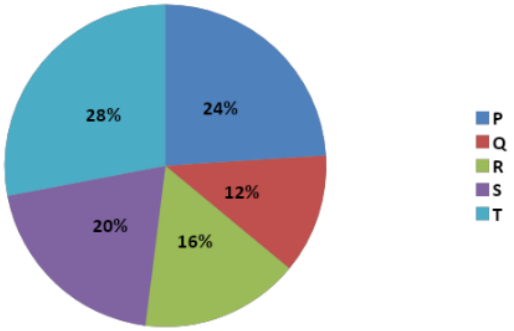


Table given below shows the ratio of total revenue collected from 2 - wheelers to the total revenue collected from 4 - wheelers at different lanes of the toll plaza.

Lanes	Ratio of total revenue collected from 2- wheelers to that from 4-wheelers
P	3:2
Q	15:16
R	21:20
S	3:2
T	39:32

Note: Total revenue collected at toll plaza from all the five lanes together on that day is Rs.15180.

Q6 Ratio of total wheels of all the vehicles passed from lane P to lane S of the toll plaza is (2a - 2): (a + 3), then which of the following is not TRUE?

(A) $3\sqrt{(a+1)} = 2$

(B) $\sqrt{(a+2)} = 3$

(C) a - 3 = 4

(D) (a + 8)÷3 = 5

Q7 What is the difference between total 2 - wheelers and total 4 - wheelers passed from the toll plaza though all the five lanes together?

(A) 21 (B) 19

(C) 23 (D) 17

Q8 Consider the following statements given below and mark the correct option.

x = Difference between total 2 - wheelers and 4 - wheelers passed from lane S.

y = Total 4 - wheelers passed from lane Q + 1

(A) x > y

(B) x + y = 8

(C) $x^2 + y^2 = 25$

(D) x – y = 0

Q9 Total revenue collected from all the vehicles from lane R of the toll plaza is what percent of total revenue collected from all the vehicles from lane S of that toll plaza?

(A) 74% (B) 88%

(C) 78% (D) 82%

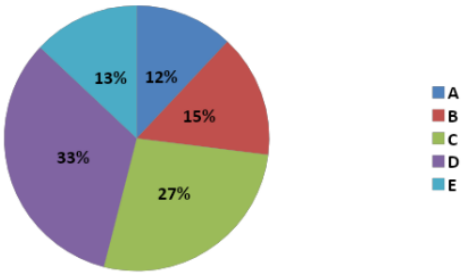
Q10 What is the sum of the number of 2 wheeler passed from lane P, R and S?

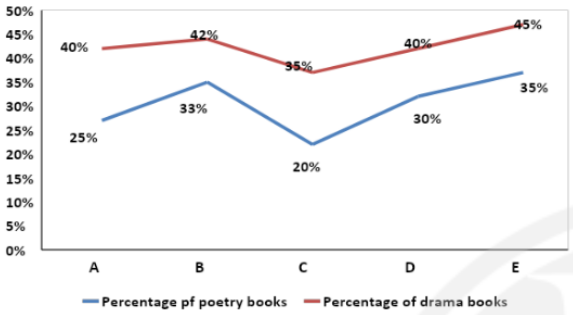
Directions (11-15) Read the following passage and answer the given questions.

Three types of books i.e. poetry, drama and prose, are published by five different publishers. The pie chart given below shows the percentage distribution of the number of books published by different publishers (A, B, C, D and E) in 2015, while the line graph below shows the percentage of poetry books and percentage of drama books published out of the total number of books published by each publisher in 2015.

The number of prose books published by A is 27 more than the number of prose books published by B.

Percentage distribution of the number of books published





Q11 Find the difference between the number of poetry books and drama books published by publisher B in 2015.

(A) 72 (B) 81

(C) 93 (D) 102

Q12 If $\frac{19}{27}$th of the number of prose books published by publisher C in 2015 were sold, then find the number of unsold prose books of publisher C.

(A) 196 (B) 216

(C) 244 (D) 252

Q13 The selling price of each poetry, drama and prose book published by D is Rs. 12, Rs. 15 and Rs. 7, respectively. If the revenue generated by the sale of poetry books, drama books and prose books is Rs. 4032, Rs. 8850 and Rs. 3353, respectively, then find the ratio of the number of unsold poetry and unsold drama books together to the number of unsold prose books by publisher D.

(A) 4 : 1 (B) 5 : 2

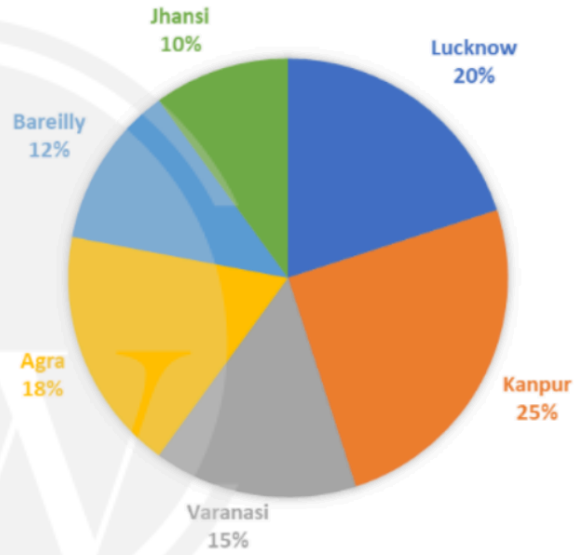
(C) 4 : 3 (D) 7 : 5

Q14 What is the sum of poetry books published by A, B and C?

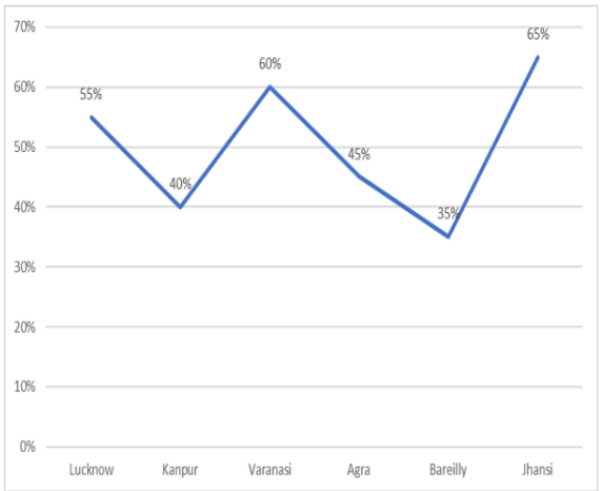
Q15 What is the difference between total poetry books and total drama books published by A, B, C, D and E ?

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

Below pie chart shows the percentage distribution of sales of cooking oil in six different cities as a percentage of total sales. In each city, only two brands of cooking oil Fortuna and Nutrela are sold. The total sales of cooking oil are 36000 liters.-



Below line graph shows the sales of Fortuna cooking oil in city X as a percentage of the total sale of cooking oil in city X -



Q16

What will be the difference (in liters) in the sale of cooking oil in Bareilly and Lucknow together by Nutrela and the total sale of cooking oil in Kanpur and Jhansi together by Fortuna?

(A) 110 (B) 109

(C) 108 (D) 107

Q17 If the selling price of Fortuna and Nutrela cooking oil are Rs. 156 per liters and Rs. 164 per liters respectively, then how much more or less revenue is generated by Fortuna by selling cooking oil in Varanasi than that of by Nutrela by selling cooking oil in Agra?

(A) 78046 (B) 79056

(C) 80066 (D) 91076

Q18 What is the respective ratio of sales of cooking oil in Lucknow and Varanasi together by Nutrela and the sales of cooking oil in Kanpur and Agra together by Fortuna?

(A) 151 : 181 (B) 150 : 181

(C) 151 : 183 (D) None of these

Q19 What will be the central angle (in degrees) formed by the sale of cooking oil in Agra, Kanpur and Bareilly together?

(A) 200° (B) 199°

(C) 198° (D) 197°

Q20 The sale of cooking oil in Varanasi and Jhansi together by Fortuna is what percentage more or less than the sale of cooking oil in the same cities by Nutrela?

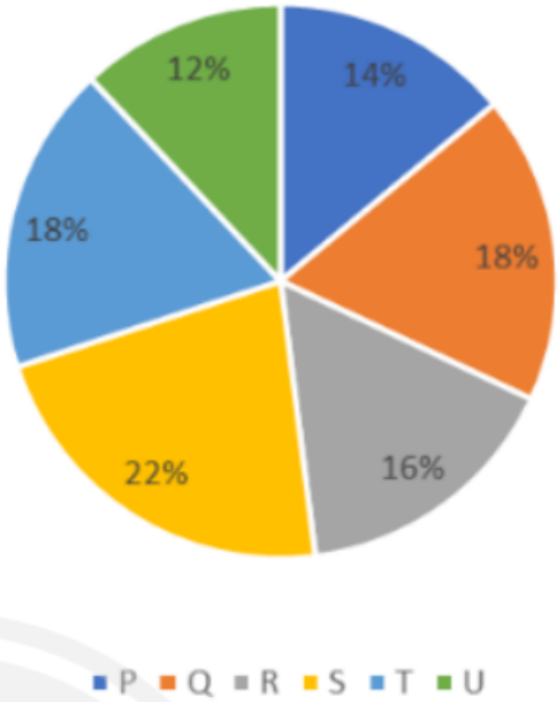
(A) 68.5% (B) 66.33%

(C) 63.16% (D) 67.25%

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

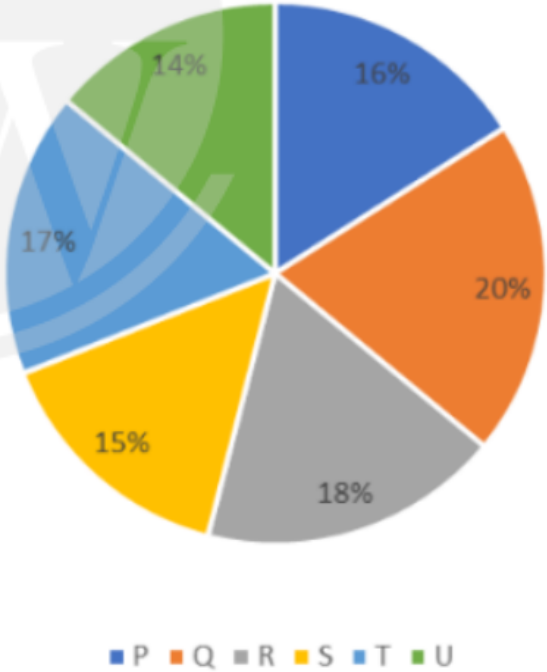
Below pie chart shows the percentage breakup of students enrolling in various colleges during 2015.

Total students = 52500 (Male + Female)



Below pie chart shows the percentage breakup of female students enrolling in various colleges during 2015.

Total female students = 24000



Q21 What is the ratio of male students enrolled in college P and T together to female students enrolled in college R and U taken together?

(A) 30 : 23 (B) 74 : 57

(C) 15 : 13 (D) 37 : 32

Q22 If the ratio of BSC, BCOM and BA students enrolled in college R is 4 : 5 : 6. Then find the total number of students enrolled for BCOM in college R (Assume only these three branches are there in College R)?

(A) 2500 (B) 2600

(C) 2700 (D) 2800

Q23 Female students from S and T taken together are approximately what percent less than male students from Q and T taken together?

(A) 29.4% (B) 23.5%

(C) 20.4% (D) 25.5%

Q24 Male and female students from college Q during 2016 increased by 20% and 25% respectively then, what is the percentage change in UG students from Q during 2015 to 2016 if the ratio of UG to PG students during 2015 and 2016 is 8 : 7 and 3 : 2 respectively?

(A) 37.8% (B) 34.4%

(C) 22.5% (D) 35.4%

Q25 If 80%, 75%, 80% and 90% of students from colleges Q, R, S and U respectively passed in the examination then the approximate average students passing from these 4 colleges are?

(A) 7181 (B) 7192

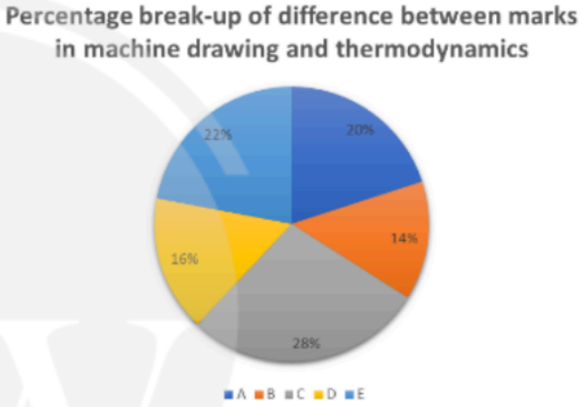
(C) 7103 (D) 7114

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

The following table represents the distribution of marks obtained by five students at an engineering college and the pie-chart represents the percentage break-up of difference between marks obtained by these students in Machine drawing and Thermodynamics. Total marks obtained = Sum of marks obtained in Thermodynamics (TH), Solid Mechanics (SM), Engineering Materials (EM) and Machine Drawing (MD).

Students	Marks obtained in SM and MD together	The respective ratio of marks obtained SM and EM
A	184	4 : 3
B	140	7 : 8
C	166	3 : 5
D	228	9 : 7
E	225	10 : 9

(Note: Marks obtained by each student in Thermodynamics are more than the marks obtained by each student in Machine Drawing.)



Some data is also given:

1. The difference between marks obtained by C in TH and MD is 70.
2. Marks obtained by A and E in SM are in the ratio 6: 7 respectively.
3. C got 50 marks less than E in SM.
4. Marks obtained by B and C together in EM is 246.
5. D got 98 marks in EM and E got 491 marks in all four subjects.

Q26 Difference between marks obtained by C in machine drawing and engineering materials is approximately what percent of the difference between marks obtained by E in machine drawing and solid mechanics?

(A) 172% (B) 124%

(C) 156% (D) 134%

Q27 What is the respective ratio of marks obtained by A, C and E together in thermodynamics to the marks obtained by B, C and D together in solid mechanics?

(A) 4 : 3 (B) 12 : 11

(C) 9 : 8 (D) 6 : 5

Q28 If A got 76% marks in thermodynamics, 51.2% marks in machine drawing, 75% marks in solid mechanics and 45% marks in engineering mechanics, then calculate the overall percentage obtained by D in all given subjects together.

(A) 71% (B) 74%

(C) 68% (D) 63%

Q29 Marks obtained by A and D together in solid mechanics are 6 more than the marks obtained by D and F together in thermodynamics. What is the average of marks obtained by A, B and F taken together in thermodynamics?

(A) 99 (B) 100

(C) 101 (D) 102

Q30 Quantity I: What is the average of marks obtained by C, D and E taken together in engineering materials?

Quantity II: What is the difference between marks obtained by B in thermodynamics and solid mechanics together and marks obtained by E in machine drawing?

Quantity III: What are the marks obtained by A in machine drawing?

(A) Quantity I > Quantity II < Quantity III

(B) Quantity I > Quantity II > Quantity III

(C) Quantity I < Quantity II < Quantity III

(D) Quantity III > Quantity I < Quantity II

Answer Key

Q1	(B)	Q16	(C)
Q2	(D)	Q17	(B)
Q3	(A)	Q18	(B)
Q4	(D)	Q19	(C)
Q5	(C)	Q20	(C)
Q6	(D)	Q21	(D)
Q7	(B)	Q22	(D)
Q8	(D)	Q23	(B)
Q9	(D)	Q24	(A)
Q10	29	Q25	(B)
Q11	(B)	Q26	(D)
Q12	(B)	Q27	(A)
Q13	(A)	Q28	(B)
Q14	801	Q29	(C)
Q15	708	Q30	(B)

Hints & Solutions

Q1. Text Solution:

Topic: Multiple Charts

Total number of students in the college $= 184 + x + 150 + 210 + 360 + 182 + 178$

$+ 96 + 78 + 121 + 250 + 35$

$184 + x + 150 + 210 + 360 + 182 + 178$

$+ 96 + 78 + 121 + 250 + 35 = 2100$

$x = 256$

Month	Number of boys	Number of girls
January	$\frac{13}{23} \times 184 = 104$	$\frac{10}{23} \times 184 = 80$
February	$\frac{7}{16} \times 256 = 112$	$\frac{9}{16} \times 256 = 144$
March	$\frac{3}{5} \times 150 = 90$	$\frac{2}{5} \times 150 = 60$
April	$\frac{4}{7} \times 210 = 120$	$\frac{3}{7} \times 210 = 90$
May	$\frac{7}{18} \times 360 = 140$	$\frac{11}{18} \times 360 = 220$
June	$\frac{9}{14} \times 182 = 117$	$\frac{5}{14} \times 182 = 65$

Required difference = 112 – 104 = **8**.

Answer: -B

Q2. Text Solution:

Topic: Multiple Charts

Total number of students in the college $= 184 + x + 150 + 210 + 360 + 182 + 178$

$+ 96 + 78 + 121 + 250 + 35$

$184 + x + 150 + 210 + 360 + 182 + 178$

$+ 96 + 78 + 121 + 250 + 35 = 2100$

$x = 256$

Month	Number of boys	Number of girls
January	$\frac{13}{23} \times 184 = 104$	$\frac{10}{23} \times 184 = 80$
February	$\frac{7}{16} \times 256 = 112$	$\frac{9}{16} \times 256 = 144$
March	$\frac{3}{5} \times 150 = 90$	$\frac{2}{5} \times 150 = 60$
April	$\frac{4}{7} \times 210 = 120$	$\frac{3}{7} \times 210 = 90$
May	$\frac{7}{18} \times 360 = 140$	$\frac{11}{18} \times 360 = 220$
June	$\frac{9}{14} \times 182 = 117$	$\frac{5}{14} \times 182 = 65$

Required average $= \frac{80+60+90+220+65)}{5} = 103$

Answer: -D

Q3. Text Solution:

Topic: Multiple Charts

Total number of students in the college $= 184 + x + 150 + 210 + 360 + 182 + 178$

$+ 96 + 78 + 121 + 250 + 35$

$184 + x + 150 + 210 + 360 + 182 + 178$

$+ 96 + 78 + 121 + 250 + 35 = 2100$

$x = 256$

Month	Number of boys	Number of girls
January	$\frac{13}{23} \times 184 = 104$	$\frac{10}{23} \times 184 = 80$
February	$\frac{7}{16} \times 256 = 112$	$\frac{9}{16} \times 256 = 144$
March	$\frac{3}{5} \times 150 = 90$	$\frac{2}{5} \times 150 = 60$
April	$\frac{4}{7} \times 210 = 120$	$\frac{3}{7} \times 210 = 90$
May	$\frac{7}{18} \times 360 = 140$	$\frac{11}{18} \times 360 = 220$
June	$\frac{9}{14} \times 182 = 117$	$\frac{5}{14} \times 182 = 65$

Required difference = 78 × 48 – 121 × 22 = 3744 – 2662 = Rs. **1082**.

Answer: -A

Q4. Text Solution:

Topic: Multiple Charts

Total number of students in the college $= 184 + x + 150 + 210 + 360 + 182 + 178$

$+ 96 + 78 + 121 + 250 + 35$

$184 + x + 150 + 210 + 360 + 182 + 178$

$+ 96 + 78 + 121 + 250 + 35 = 2100$

$x = 256$

Month	Number of boys	Number of girls
January	$\frac{13}{23} \times 184 = 104$	$\frac{10}{23} \times 184 = 80$
February	$\frac{7}{16} \times 256 = 112$	$\frac{9}{16} \times 256 = 144$
March	$\frac{3}{5} \times 150 = 90$	$\frac{2}{5} \times 150 = 60$
April	$\frac{4}{7} \times 210 = 120$	$\frac{3}{7} \times 210 = 90$
May	$\frac{7}{18} \times 360 = 140$	$\frac{11}{18} \times 360 = 220$
June	$\frac{9}{14} \times 182 = 117$	$\frac{5}{14} \times 182 = 65$

Required number of girls $= \frac{12}{25} \times 250 + \frac{3}{5} \times 35 = 120 + 21 = 141.$

Answer: -D

Q5. Text Solution:

Topic: Multiple Charts

Total number of students in the college $= 184 + x + 150 + 210 + 360 + 182 + 178 + 96 + 78 + 121 + 250 + 35$

$184 + x + 150 + 210 + 360 + 182 + 178 + 96 + 78 + 121 + 250 + 35 = 2100$

$x = 256$

Month	Number of boys	Number of girls
January	$\frac{13}{23} \times 184 = 104$	$\frac{10}{23} \times 184 = 80$
February	$\frac{7}{16} \times 256 = 112$	$\frac{9}{16} \times 256 = 144$
March	$\frac{3}{5} \times 150 = 90$	$\frac{2}{5} \times 150 = 60$
April	$\frac{4}{7} \times 210 = 120$	$\frac{3}{7} \times 210 = 90$
May	$\frac{7}{18} \times 360 = 140$	$\frac{11}{18} \times 360 = 220$
June	$\frac{9}{14} \times 182 = 117$	$\frac{5}{14} \times 182 = 65$

Required number of girls from other departments than Science who have birthday on August = (25% of 96) – 7

= 24 – 7 = 17.

Answer: -C

Q6. Text Solution:

Topic: Multiple Charts

Let the total vehicles passed from lanes P, Q, R, S, and T of the toll plaza is '24x', '12x', '16x', '20x', and ' $28x$ ' respectively.

Total revenue collected = Total vehicles × Tax per vehicles

Total vehicle $= \frac{\text{Total revenue collected}}{\text{Total tax per vehicle}}$

Hence, the ratio of total 2 - wheelers to 4 - wheelers from a lane is equal to the total revenue collected divided from 2 - wheelers to 4 - wheelers divided by respective toll tax per vehicle.

Lane P:

Ratio of 2 - wheelers to 4 - wheelers passed $= \left(\frac{3}{180}\right) : \left(\frac{2}{240}\right) = 2 : 1$

2 - wheelers passed $= 24x \times \left(\frac{2}{3}\right) = 16x$

4 - wheelers passed $= 24x \times \left(\frac{1}{3}\right) = 8x$

Lane Q:

Ratio of 2 - wheelers to 4 - wheelers passed $= \left(\frac{15}{180}\right) : \left(\frac{16}{240}\right) = 5 : 4$

2 - wheelers passed $= 12x \times \left(\frac{5}{9}\right) = \frac{20x}{3}$

4 - wheelers passed $= 12x \times \left(\frac{4}{9}\right) = \frac{16x}{3}$

Lane R:

Ratio of 2 - wheelers to 4 - wheelers passed $= \left(\frac{21}{180}\right) : \left(\frac{20}{240}\right) = 7 : 5$

2 - wheelers passed $= 16x \times \left(\frac{7}{12}\right) = \frac{28x}{3}$

4 - wheelers passed $= 16x \times \left(\frac{5}{12}\right) = \frac{20x}{3}$

Lane S:

Ratio of 2 - wheelers to 4 - wheelers passed $= \left(\frac{3}{180}\right) : \left(\frac{2}{240}\right) = 2 : 1$

2 - wheelers passed $= 20x \times \left(\frac{2}{3}\right) = \frac{40x}{3}$

4 - wheelers passed $= 20x \times \left(\frac{1}{3}\right) = \frac{20x}{3}$

Lane T:

Ratio of 2 - wheelers to 4 - wheelers passed $= \left(\frac{39}{180}\right) : \left(\frac{32}{240}\right) = 13 : 8$

2 - wheelers passed $= 28x \times \left(\frac{13}{21}\right) = \frac{52x}{3}$

4 - wheelers passed $= 28x \times \left(\frac{8}{21}\right) = \frac{32x}{3}$

Total 2 - wheelers passed from the toll plaza $=$

$$16x + \left(\frac{20x}{3}\right) + \left(\frac{28x}{3}\right) + \left(\frac{40x}{3}\right) + \left(\frac{52x}{3}\right) = \frac{(48 + 20 + 28 + 40 + 52)x}{3} = \frac{188x}{3}$$

Total 4 - wheelers passed from the toll plaza $=$

$$8x + \left(\frac{16x}{3}\right) + \left(\frac{20x}{3}\right) + \left(\frac{20x}{3}\right) + \left(\frac{32x}{3}\right) = \frac{(24 + 16 + 20 + 20 + 32)x}{3} = \frac{112x}{3}$$

$$\text{Total revenue collected} = \left[\left(\frac{188x}{3}\right) \times 180\right] + \left[\left(\frac{112x}{3}\right) \times 240\right] = 15180$$

$188x \times 60 + 112x \times 80 = 15180$

$188x \times 6 + 112x \times 8 = 1518$

$1128x + 896x = 1518$

$2024x = 1518$

$x = \frac{1518}{2024} = \frac{(2 \times 3 \times 11 \times 23)}{(2 \times 2 \times 2 \times 11 \times 23)}$

$x = \frac{3}{4}$

Lanes	Total 2 –wheelers passed	Total 4- wheelers passed
P	16x = 12	8x = 6
Q	$\frac{20x}{3} = 5$	$\frac{16x}{3} = 4$
R	$\frac{28x}{3} = 7$	$\frac{20x}{3} = 5$
S	$\frac{40x}{3} = 10$	$\frac{20x}{3} = 5$
T	$\frac{52x}{3} = 13$	$\frac{32x}{3} = 8$

Total wheels of all the vehicles passed from lane P

= (12 x 2) + (6 x 4) = 24 + 24 = 48

Total wheels of all the vehicles passed from lane S

= (10 x 2) + (5 x 4) = 20 + 20 = 40

According to the question:

48: 40 = (2a - 2): (a + 3)

6: 5 = (2a - 2): (a + 3)

6 (a + 3) = 5 (2a - 2)

6a + 18 = 10a – 10

4a = 28

a = 7

Option (a):

=3√(a+1)=3√(7+1) = 3√8 = 2

Option (b):

= √(a + 2) = √(7 + 2) = √9 = 3

Option (c):

= a - 3 = 7 - 3 = 4

Option (d):

= **(a + 8) ÷ 3** = 15 ÷ 3 **= 5**

Answer: -D

Q7. Text Solution:

Topic: Multiple Charts

Total 2 - wheelers passed from the toll plaza though all the five lanes together = 12 + 5 + 7 + 10 + 13 = 47

Total 4 - wheelers passed from the toll plaza though all the five lanes together = 6 + 4 + 5 + 5 + 8 = 28

Required difference = 47 – 28 = **19**

Answer: -B

Q8. Text Solution:

Topic: Multiple Charts

Difference between total 2 - wheelers and 4 - wheelers passed from lane S = 10 – 5

x = 5

Total 4 - wheelers passed from lane Q + 1 = 4 + 1

y = 5

Hence, x = y = 5

x + y = 5 + 5 = 10

$x^2 + y^2 = 5^2 + 5^2 = 25 + 25 = 50$

x - y = 5 - 5 **= 0**

Answer: -D

Q9. Text Solution:

Topic: Multiple Charts

Total revenue collected from all the vehicles from lane R of the toll plaza

= (7 x 180) + (5 x 240) = 1260 + 1200 = Rs.2460

Total revenue collected from all the vehicles from lane S of the toll plaza $= (10 \times 180) + (5 \times 240) = 1800 + 1200 =$ Rs. 3000

$$\text{Required percent} = \left(\frac{2460}{3000}\right) \times 100$$

$$= 82\%$$

Answer: -D

Q10. Text Solution:

Rquired Sum = 12 + 7 + 10 = **29**

Q11. Text Solution:

Topic: Multiple Charts

Let the total number of books published by all the publishers together be ' x '.

$\{100 - (25 + 40)\}\%$ of 12% of $x - \{100 - (33 + 42)\}\%$ of 15% of $x = 27$

35% of 12% of $x - 25\%$ of 15% of $x = 27$

$0.042x - 0.0375x = 27 \qquad 0.0045x = 27$

$x = 6000$

Publisher	Total number of books published	Number of poetry books published	Number of drama books published	Number of prose books published
A	12% of 6000 = 720	25% of 720 = 180	40% of 720 = 288	252
B	15% of 6000 = 900	33% of 900 = 297	42% of 900 = 378	225
C	27% of 6000 = 1620	20% of 1620 = 324	35% of 1620 = 567	729
D	33% of 6000 = 1980	30% of 1980 = 594	40% of 1980 = 792	594
E	13% of 6000 = 780	35% of 780 = 273	45% of 780 = 351	156
Total	6000	1668	2376	1956

Required difference = 378 – 297 = **81**

Answer: -B

Q12. Text Solution:

Topic: Multiple Charts

Required number of unsold prose books $= \frac{8}{27} \times 729 = 216.$

Answer: -B

Q13. Text Solution:

Topic: Multiple Charts

Number of poetry books sold by publisher $D = \frac{4032}{12} = 336$ Number of drama books sold by publisher $D = \frac{8850}{15} = 590$ Number of prose books sold by publisher $D = \frac{3353}{7} = 479$ Required ratio $= (594 + 792 - 336 - 590) : (594 - 479)$ $= 460 : 115 = 4 : 1.$

Answer: -A

Q14. Text Solution:

Required sum = 180 + 297 + 324 = **801**.

Q15. Text Solution:

Topic: Multiple Charts

Total poetry books = 180 + 297 + 324 + 594 + 273 = 1668

Total drama books = 288 + 378 + 567 + 792 + 351 = 2376

Required difference = 2376 – 1668 = **708.**

Q16. Text Solution:

Topic: Multiple Charts

The total sales of cooking oil are 36000 liters.

In the city Lucknow:

Total sale $= 36000 \times \frac{20}{100}$ = 7200 liters

Total sale by Fortuna $= 7200 \times \frac{55}{100}$ = 3960 liters

Total sale by Nutrela $= 7200 \times \frac{45}{100}$ = 3240 liters

Calculating data for remaining cities:

City	Total Sale (in L)	Fortuna (in L)	Nutrela (in L)
Lucknow	7200	3960	3240
Kanpur	9000	3600	5400
Varanasi	5400	3240	2160
Agra	6480	2916	3564
Bareily	4320	1512	2808
Jhansi	3600	2340	1260
Total	36000	17568	18432

The sale of cooking oil in Bareilly and Lucknow together by Nutrela = 2808 + 3240 = 6048 liters

The sale of cooking oil in Kanpur and Jhansi together by Fortuna = 3600 + 2340 = 5940 liters

Required difference = 6048 – 5940 = 108 liters

Q17. Text Solution:

Topic: Multiple Charts

City	Total Sale (in L)	Fortuna (in L)	Nutrela (in L)
Lucknow	7200	3960	3240
Kanpur	9000	3600	5400
Varanasi	5400	3240	2160
Agra	6480	2916	3564
Bareily	4320	1512	2808
Jhansi	3600	2340	1260
Total	36000	17568	18432

The revenue generated by Fortuna by selling cooking oil in Varanasi = 3240 × 156 = Rs. 505440

The revenue generated by Nutrela by selling cooking oil in Agra = 3564 × 164 = Rs. 584496

Required difference = 584496 – 505440 = Rs. 79056

Q18. Text Solution:

Topic: Multiple Charts

City	Total Sale (in L)	Fortuna (in L)	Nutrela (in L)
Lucknow	7200	3960	3240

Kanpur	9000	3600	5400
Varanasi	5400	3240	2160
Agra	6480	2916	3564
Bareily	4320	1512	2808
Jhansi	3600	2340	1260
Total	36000	17568	18432

Required ratio = (3240 + 2160): (3600 + 2916)

= 5400: 6516

= 150: 181.

Q19. Text Solution:

Topic: Multiple Charts

City	Total Sale (in L)	Fortuna (in L)	Nutrela (in L)
Lucknow	7200	3960	3240
Kanpur	9000	3600	5400
Varanasi	5400	3240	2160
Agra	6480	2916	3564
Bareily	4320	1512	2808
Jhansi	3600	2340	1260
Total	36000	17568	18432

Central angle formed = $\frac{18+25+12}{100} \times 360 = 198°$

Q20. Text Solution:

Topic: Multiple Charts

City	Total Sale (in L)	Fortuna (in L)	Nutrela (in L)
Lucknow	7200	3960	3240
Kanpur	9000	3600	5400
Varanasi	5400	3240	2160
Agra	6480	2916	3564
Bareily	4320	1512	2808
Jhansi	3600	2340	1260
Total	36000	17568	18432

The sale of cooking oil in Varanasi and Jhansi together by Fortuna = 3240 + 2340 = 5580

The sale of cooking oil in the same cities by Nutrela = 2160 + 1260 = 3420

Required percentage = $\frac{5580-3420}{3420} \times 100$ = 63.16%

Q21. Text Solution:

Topic: Multiple Charts

Students enrolled in various colleges during 2015 can be calculated as:

From P:

Enrolled = =7350

Female = = 3840

Male = (7350 – 3840) = 3510

Based on the above data we get:

College	Enrolled	Female	Male
P	7350	3840	3510
Q	9450	4800	4650
R	8400	4320	4080
S	11550	3600	7950
T	9450	4080	5370
U	6300	3360	2940
Total	52500	24000	28500

Male students enrolled in college P and T together = (3510 + 5370) = 8880

Female students enrolled in college R and U together = (4320 + 3360) = 7680

Required ratio= 8880 : 7680 = 37 : 32

Q22. Text Solution:

Topic: Multiple Charts

College	Enrolled	Female	Male
P	7350	3840	3510
Q	9450	4800	4650
R	8400	4320	4080
S	11550	3600	7950
T	9450	4080	5370
U	6300	3360	2940
Total	52500	24000	28500

Students enrolled for BCOM in college R = $8400 \times \frac{5}{15}$

= 2800

Q23. Text Solution:

Topic: Multiple Charts

College	Enrolled	Female	Male
P	7350	3840	3510
Q	9450	4800	4650
R	8400	4320	4080
S	11550	3600	7950

T	9450	4080	5370
U	6300	3360	2940
Total	52500	24000	28500

Female students from S and T = (3600 + 4080) = 7680

Male students from Q and T = (4650 + 5370) = 10020

Required percent = $\frac{10020-7680}{10020} \times 100$

= 23.35%

= 23.5% approx.

Q24. Text Solution:

Topic: Multiple Charts

College	Enrolled	Female	Male
P	7350	3840	3510
Q	9450	4800	4650
R	8400	4320	4080
S	11550	3600	7950
T	9450	4080	5370
U	6300	3360	2940
Total	52500	24000	28500

Male students from Q during 2016 = $4650 \times \frac{120}{100}$

= 5580

Female students from Q during 2016 = $4800 \times \frac{125}{100}$ = 6000

Total students from Q during 2016 = (5580 + 6000) = 11580

UG students from Q during 2016 = $11580 \times \frac{3}{5}$ = 6948

UG students from Q during 2015 = $9450 \times \frac{8}{15}$ =5040

Required percent = $\frac{6948-5040}{5040} \times 100$

= 37.8% (approx.)

Q25. Text Solution:

Topic: Multiple Charts

College	Enrolled	Female	Male
P	7350	3840	3510
Q	9450	4800	4650
R	8400	4320	4080
S	11550	3600	7950
T	9450	4080	5370
U	6300	3360	2940
Total	52500	24000	28500

Passed students from college Q = 80% of 9450 = 7560

Passed students from college R = 75% of 8400 = 6300

Passed students from college S = 80% of 11550 = 9240

Passed students from college U = 90% of 6300 = 5670

Required average = $\frac{7560+6300+9240+5670}{4}$

= 7192 (approx.)

Q26. Text Solution:

Topic: Multiple Charts

Here, given that marks obtained by each student in TH are more than their marks in MD.

Difference between marks obtained by C in TH and MD = 70

Then, sum of difference between marks obtained by all students in TH and MD = $70 \times \frac{100}{20}$=250

For E:

E got 491 marks in all four subjects. Then,

TH – MD = 22% of 250 = 55

TH = 55 + MD

SM = 225 – MD

$EM = \frac{9}{10} \times SM = \frac{9}{10} \times (225 - MD)$

And, MD + TH + SM + EM = 491

MD + (55 + MD) + (225 – MD) + $\frac{9}{10} \times (225 - MD)$

= 491

MD = 85, TH = 55 + 85 = 140

SM = 225 – 85 = 140, EM = $\frac{9}{10} \times 140$=126

For A:

Marks obtained by A and E in SM are in the ratio 6 : 7 respectively. Then

SM = $\frac{6}{7} \times 140 = 120$

EM = $\frac{3}{4} \times 120 = 90$

MD = 184 – SM = 184 – 120 = 64.

TH – MD = 20% of 250 = 50

TH= 50 + MD = 50 + 64 = 114

Total marks

= MD + TH + SM + EM = 64 + 114 + 120 + 90

= 388.

For C :

C got 50 marks less than E in SM. Then,

SM = 140 – 50 = 90

TH – MD = 70

EM = $\frac{5}{3} \times 90 = 150$

MD = 166 – SM = 166 – 90 = 76

TH = 70 + MD = 70 + 76 = 146

Total marks = MD + TH+ SM + EM

= 76 + 146 + 90 + 150 = 462

For B :

Marks obtained by B and C together in EM is 246. Then,

EM = 246 – 150 = 96

TH – MD = 14% of 250 = 35

SM = $\frac{7}{8} \times 96 = 84$

MD = 140 – SM = 140 – 84 = 56

TH = 35 + MD = 35 + 56 = 91

Total marks = MD + TH + SM + EM

= 56 +91 +84 + 96 = 327

For D :

D got 98 marks in EM. Then,

EM = 98

TH – MD = 16% of 250 = 40.

SM = $\frac{9}{7} \times 98 = 126$

MD = 228 – SM = 228 – 126 = 102

TH = MD + 40 = 102 + 40 = 142

Total marks = MD + TH + SM + EM

= 102 + 142 + 126 + 98 = 468

Therefore, we have

Students	Marks Obtained				
	SM	MD	TH	EM	Total
A	120	64	114	90	388
B	84	56	91	96	327
C	90	76	146	150	462
D	126	102	142	98	468
E	140	85	140	126	491

Difference between marks obtained by C in machine drawing and engineering materials

= 150 – 76 = 74

And, difference between marks obtained by E in machine drawing and solid mechanics

= 140 – 85 = 55

Therefore, percentage = $\frac{74}{55} \times 100$=134% (approx.)

Hence, option d is correct.

Q27. Text Solution:

Topic: Multiple Charts

Students	Marks Obtained				
	SM	MD	TH	EM	Total
A	120	64	114	90	388
B	84	56	91	96	327
C	90	76	146	150	462
D	126	102	142	98	468
E	140	85	140	126	491

Here, marks obtained by A, C and E together in thermodynamics = 114 + 146 + 140 = 400

And, marks obtained by B, C and D together in solid mechanics = 84+ 90 + 126 = 300

Therefore, ratio = 400 : 300 = 4 : 3

Q28. Text Solution:

Topic: Multiple Charts

Students	Marks Obtained				
	SM	MD	TH	EM	Total
A	120	64	114	90	388
B	84	56	91	96	327
C	90	76	146	150	462
D	126	102	142	98	468
E	140	85	140	126	491

Here, maximum marks in thermodynamics = $114 \times \frac{100}{76}$= 150

Maximum marks in machine drawing = $64 \times \frac{100}{51.2}$= 125

Maximum marks in solid mechanics = $120 \times \frac{100}{75}$ = 160

Maximum marks in engineering materials = $90 \times \frac{100}{45} = 200$

Total maximum marks = 150 + 125 + 160 + 200 = 635

Total marks obtained by D = 468

Therefore, percentage = $\frac{468}{635} \times 100$=74% (approx.)

Q29. Text Solution:

Topic: Multiple Charts

Students	Marks Obtained				
	SM	MD	TH	EM	Total
A	120	64	114	90	388
B	84	56	91	96	327
C	90	76	146	150	462
D	126	102	142	98	468
E	140	85	140	126	491

Here, marks obtained by A and D together in SM = 120 + 126 = 246

Then, marks obtained by D and F together in thermodynamics = 246 – 6 = 240

Now, marks obtained by D in thermodynamics = 142

Then, marks obtained by F in thermodynamics = 240 – 142 = 98

Therefore, average of marks obtained by A, B and F taken together in thermodynamics = $\frac{114+91+98}{3}$

= 101

Q30. Text Solution:

Topic: Multiple Charts

Students	Marks Obtained				
	SM	MD	TH	EM	Total
A	120	64	114	90	388
B	84	56	91	96	327
C	90	76	146	150	462
D	126	102	142	98	468
E	140	85	140	126	491

Quantity I:

Here, average of marks obtained by C, D and E taken together in engineering materials

= $\frac{150+98+126}{3}$

= 124.67

Therefore, quantity I = 124.67

Quantity II:

Marks obtained by B in thermodynamics and solid mechanics together = 91 + 84 = 175

And, marks obtained by E in machine drawing = 85

Then, difference = 175 – 85 = 90

Therefore, quantity II = 90

Quantity III:

Marks obtained by A in machine drawing = 64

Therefore, quantity III = 64

Hence, Quantity I > Quantity II > Quantity III