



Study the following table and answer the questions based on it.

Entrance

Expenditures of a Company (in Lakh Rupees) per Annum Over the given Years.

Year	Item of Expenditure				
	Salary	Fuel and Transport	Bonus	Interest on Loans	Taxes
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88
2002	420	142	3.96	49.4	98

1. What is the average amount of interest per year which the company had to pay during this period?

- A. Rs. 32.43 lakhs
- B. Rs. 33.72 lakhs
- C. Rs. 34.18 lakhs
- D. Rs. 36.66 lakhs

Answer: Option D

Explanation:

Average amount of interest paid by the Company during the given period

$$= \text{Rs.} \left[\frac{23.4 + 32.5 + 41.6 + 36.4 + 49.4}{5} \right] \text{ lakhs}$$

$$= \text{Rs.} \left[\frac{183.3}{5} \right] \text{ lakhs}$$

$$= \text{Rs. 36.66 lakhs.}$$

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2. The total amount of bonus paid by the company during the given period is approximately what percent of the total amount of salary paid during this period?

- A. 0.1%
- B. 0.5%
- C. 1%
- D. 1.25%

Answer: Option C

Explanation:

$$\begin{aligned}\text{Required percentage} &= \left[\frac{(3.00 + 2.52 + 3.84 + 3.68 + 3.96)}{(288 + 342 + 324 + 336 + 420)} \times 100 \right] \% \\ &= \left[\frac{17}{1710} \times 100 \right] \% \\ &\approx 1\%.\end{aligned}$$

3. Total expenditure on all these items in 1998 was approximately what percent of the total expenditure in 2002?

- A. 62%
- B. 66%
- C. 69%
- D. 71%

Answer: Option C

Explanation:

$$\begin{aligned}\text{Required percentage} &= \left[\frac{(288 + 98 + 3.00 + 23.4 + 83)}{(420 + 142 + 3.96 + 49.4 + 98)} \times 100 \right] \% \\ &= \left[\frac{495.4}{713.36} \times 100 \right] \% \\ &\approx 69.45\%.\end{aligned}$$

4. The total expenditure of the company over these items during the year 2000 is?

A. Rs. 544.44 lakhs

B. Rs. 501.11 lakhs

C. Rs. 446.46 lakhs

D. Rs. 478.87 lakhs

Answer: Option A

Explanation:

Total expenditure of the Company during 2000

= Rs. (324 + 101 + 3.84 + 41.6 + 74) lakhs

= Rs. 544.44 lakhs.

5. The ratio between the total expenditure on Taxes for all the years and the total expenditure on Fuel and Transport for all the years respectively is approximately?

- A. 4:7
- B. 10:13
- C. 15:18
- D. 5:8

Answer: Option B

Explanation:

$$\begin{aligned}\text{Required ratio} &= \left[\frac{(83 + 108 + 74 + 88 + 98)}{(98 + 112 + 101 + 133 + 142)} \right] \\ &= \left[\frac{451}{586} \right] \\ &= \frac{1}{1.3} \\ &= \frac{10}{13}\end{aligned}$$

Study the following table and answer the questions.

Number of Candidates Appeared and Qualified in a Competitive Examination from Different States Over the Years.

State	Year									
	1997		1998		1999		2000		2001	
	App.	Qual.	App.	Qual.	App.	Qual.	App.	Qual.	App.	Qual.
M	5200	720	8500	980	7400	850	6800	775	9500	1125
N	7500	840	9200	1050	8450	920	9200	980	8800	1020
P	6400	780	8800	1020	7800	890	8750	1010	9750	1250
Q	8100	950	9500	1240	8700	980	9700	1200	8950	995
R	7800	870	7600	940	9800	1350	7600	945	7990	885

1. Total number of candidates qualified from all the states together in 1997 is approximately what percentage of the total number of candidates qualified from all the states together in 1998?

A. 72%

B. 77%

C. 80%

D. 83%

Answer: Option C

Explanation:

$$\begin{aligned}\text{Required percentage} &= \left[\frac{(720 + 840 + 780 + 950 + 870)}{(980 + 1050 + 1020 + 1240 + 940)} \times 100 \right] \% \\ &= \left[\frac{4160}{5230} \times 100 \right] \% \\ &= 79.54\% \approx 80\%.\end{aligned}$$

2. What is the average candidates who appeared from State Q during the given years?

A. 8700

B. 8760

C. 8990

D. 8920

Answer: Option C

Explanation:

$$\begin{aligned}\text{Required average} &= \frac{8100 + 9500 + 8700 + 9700 + 8950}{5} \\ &= \frac{44950}{5} \\ &= 8990.\end{aligned}$$

3. In which of the given years the number of candidates appeared from State P has maximum percentage of qualified candidates?

A. 1997

B. 1998

C. 1999

D. 2001

Answer: Option D

Explanation:

The percentages of candidates qualified to candidates appeared from State P during different years are:

$$\text{For 1997 } \left(\frac{780}{6400} \times 100 \right) \% = 12.19\%.$$

$$\text{For 1998 } \left(\frac{1020}{8800} \times 100 \right) \% = 11.59\%.$$

$$\text{For 1999 } \left(\frac{890}{7800} \times 100 \right) \% = 11.41\%.$$

$$\text{For 2000 } \left(\frac{1010}{8750} \times 100 \right) \% = 11.54\%.$$

$$\text{For 2001 } \left(\frac{1250}{9750} \times 100 \right) \% = 12.82\%.$$

∴ Maximum percentage is for the year 2001.

4. What is the percentage of candidates qualified from State N for all the years together, over the candidates appeared from State N during all the years together?

- A. 12.36%
- B. 12.16%
- C. 11.47%
- D. 11.15%

Answer: Option D

Explanation:

$$\begin{aligned}\text{Required percentage} &= \left[\frac{(840 + 1050 + 920 + 980 + 1020)}{(7500 + 9200 + 8450 + 9200 + 8800)} \times 100 \right] \% \\ &= \left[\frac{4810}{43150} \times 100 \right] \% \\ &= 11.15\%\end{aligned}$$

5. The percentage of total number of qualified candidates to the total number of appeared candidates among all the five states in 1999 is?

- A. 11.49%
- B. 11.84%
- C. 12.21%
- D. 12.57%

Answer: Option B

Explanation:

$$\begin{aligned}\text{Required percentage} &= \left[\frac{(850 + 920 + 890 + 980 + 1350)}{(7400 + 8450 + 7800 + 8700 + 9800)} \times 100 \right] \% \\ &= \left[\frac{4990}{42150} \times 100 \right] \% \\ &= 11.84\%.\end{aligned}$$

The following table gives the percentage of marks obtained by seven students in six different subjects in an examination.

The Numbers in the Brackets give the Maximum Marks in Each Subject.

Student	Subject (Max. Marks)					
	Maths	Chemistry	Physics	Geography	History	Computer Science
	(150)	(130)	(120)	(100)	(60)	(40)
Ayush	90	50	90	60	70	80
Aman	100	80	80	40	80	70
Sajal	90	60	70	70	90	70
Rohit	80	65	80	80	60	60
Muskan	80	65	85	95	50	90
Tanvi	70	75	65	85	40	60
Tarun	65	35	50	77	80	80

1. What are the average marks obtained by all the seven students in Physics?
(rounded off to two digit after decimal)

- A. 77.26
- B. 89.14
- C. 91.37
- D. 96.11

Answer: Option B

Explanation:

Average marks obtained in Physics by all the seven students

$$\begin{aligned} &= \frac{1}{7} \times [(90\% \text{ of } 120) + (80\% \text{ of } 120) + (70\% \text{ of } 120) \\ &\quad + (80\% \text{ of } 120) + (85\% \text{ of } 120) + (65\% \text{ of } 120) + (50\% \text{ of } 120)] \\ &= \frac{1}{7} \times [(90 + 80 + 70 + 80 + 85 + 65 + 50)\% \text{ of } 120] \\ &= \frac{1}{7} \times [520\% \text{ of } 120] \\ &= \frac{624}{7} \\ &= 89.14. \end{aligned}$$

2. The number of students who obtained 60% and above marks in all subjects is?
- A. 1
 - B. 2
 - C. 3
 - D. None

Answer: Option B

Explanation:

From the table it is clear that Sajal and Rohit have 60% or more marks in each of the six subjects.

3. What was the aggregate of marks obtained by Sajal in all the six subjects?

A. 409

B. 419

C. 429

D. 449

Answer: Option D

Explanation:

Aggregate marks obtained by Sajal

= [(90% of 150) + (60% of 130) +
(70% of 120)

+ (70% of 100) + (90% of 60) +
(70% of 40)]

= [135 + 78 + 84 + 70 + 54 + 28]

= 449.

4. In which subject is the overall percentage the best?

- A. Maths
- B. Chemistry
- C. Physics
- D. History

Answer: Option A

Explanation:

We shall find the overall percentage (for all the seven students) with respect to each subject.

The overall percentage for any subject is equal to the average of percentages obtained by all the seven students since the maximum marks for any subject is the same for all the students.

Therefore, overall percentage for:

$$\begin{aligned} \text{(i) Maths} &= \left[\frac{1}{7} \times (90 + 100 + 90 + 80 + 80 + 70 + 65) \right] \% \\ &= \left[\frac{1}{7} \times (575) \right] \% \\ &= 82.14\%. \end{aligned}$$

$$\begin{aligned} \text{(ii) Chemistry} &= \left[\frac{1}{7} \times (50 + 80 + 60 + 65 + 65 + 75 + 35) \right] \% \\ &= \left[\frac{1}{7} \times (430) \right] \% \\ &= 61.43\%. \end{aligned}$$

$$\begin{aligned}
 \text{(iii) Physics} &= \left[\frac{1}{7} \times (90 + 80 + 70 + 80 + 85 + 65 + 50) \right] \% \\
 &= \left[\frac{1}{7} \times (520) \right] \% \\
 &= 74.29\%.
 \end{aligned}$$

$$\begin{aligned}
 \text{(iv) Geography} &= \left[\frac{1}{7} \times (60 + 40 + 70 + 80 + 95 + 85 + 77) \right] \% \\
 &= \left[\frac{1}{7} \times (507) \right] \% \\
 &= 72.43\%.
 \end{aligned}$$

$$\begin{aligned}
 \text{(v) History} &= \left[\frac{1}{7} \times (70 + 80 + 90 + 60 + 50 + 40 + 80) \right] \% \\
 &= \left[\frac{1}{7} \times (470) \right] \% \\
 &= 67.14\%.
 \end{aligned}$$

$$\begin{aligned}
 \text{(vi) Comp. Science} &= \left[\frac{1}{7} \times (80 + 70 + 70 + 60 + 90 + 60 + 80) \right] \% \\
 &= \left[\frac{1}{7} \times (510) \right] \% \\
 &= 72.86\%.
 \end{aligned}$$

Clearly, this percentage is highest for Maths.

5. What is the overall percentage of Tarun?

- A. 52.5%
- B. 55%
- C. 60%
- D. 63%

Answer: Option C

Explanation:

Aggregate marks obtained by Tarun

= [(65% of 150) + (35% of 130) + (50% of 120)

+ ((77% of 100) + (80% of 60) + (80% of 40)]

= [97.5 + 45.5 + 60 + 77 + 48 + 32]

= 360.

The maximum marks (of all the six subjects)

= (150 + 130 + 120 + 100 + 60 + 40)

= 600.

$\therefore$ Overall percentage of Tarun = $\left(\frac{360}{600} \times 100 \right) \% = 60\%$

Study the following table and answer the questions.

Classification of 100 Students Based on the Marks Obtained by them in Physics and Chemistry in an Examination.

Subject	Marks out of 50				0 and above
	40 and above	30 and above	20 and above	10 and above	
Physics	9	32	80	92	100
Chemistry	4	21	66	81	100
Average (Aggregate)	7	27	73	87	100

1. What is the different between the number of students passed with 30 as cut-off marks in Chemistry and those passed with 30 as cut-off marks in aggregate?

A. 3

B. 4

C. 5

D. 6

Answer: Option D

Explanation:

Required difference

= (No. of students scoring 30 and above marks in Chemistry)

- (Number of students scoring 30 and above marks in aggregate)

= 27 - 21

= 6.

2. If at least 60% marks in Physics are required for pursuing higher studies in Physics, how many students will be eligible to pursue higher studies in Physics?

A. 27

B. 32

C. 34

D. 41

Answer: Option B

Explanation:

$$\text{We have } 60\% \text{ of } 50 = \left(\frac{60}{100} \times 50 \right) = 30.$$

∴ Required number

= No. of students scoring 30 and above marks in Physics

= 32

3. The percentage of number of students getting at least 60% marks in Chemistry over those getting at least 40% marks in aggregate, is approximately?

A. 21%

B. 27%

C. 29%

D. 31%

Answer: Option C

Explanation:

Number of students getting at least 60% marks in Chemistry

= Number of students getting 30 and above marks in Chemistry

= 21.

Number of students getting at least 40% marks in aggregate

= Number of students getting 20 and above marks in aggregate

= 73.

$$\text{Required percentage} = \left(\frac{21}{73} \times 100 \right) \%$$

$$= 28.77\%$$

$$\approx 29\%.$$

4. The number of students scoring less than 40% marks in aggregate is?

A. 13

B. 19

C. 20

D. 27

Answer: Option D

Explanation:

$$\text{We have } 40\% \text{ of } 50 = \left(\frac{40}{100} \times 50 \right) = 20.$$

∴ Required number

= Number of students scoring less than 20 marks in aggregate

= 100 - Number of students scoring 20 and above marks in aggregate

$$= 100 - 73$$

$$= 27.$$

5. If it is known that at least 23 students were eligible for a Symposium on Chemistry, then the minimum qualifying marks in Chemistry for eligibility to Symposium would lie in the range?
- A. 40-45
 - B. 30-40
 - C. 20-30
 - D. Below 20

Answer: Option C

Explanation:

Since 66 students get 20 and above marks in Chemistry and out of these 21 students get 30 and above marks, therefore to select top 35 students in Chemistry, the qualifying marks should lie in the range 20-30.

**Number of Candidates Appeared,
Qualified and Selected in a
Competitive Examination from Five
States Delhi, H.P, U.P, Punjab and
Haryana Over the Years 1994 to
1998**

Year	Delhi			H.P			U.P			Punjab			Haryana		
	App	Qual	Sel	App	Qual	Sel	App	Qual	Sel	App	Qual	Sel	App	Qual	Sel
1997	8000	850	94	7800	810	82	7500	720	78	8200	680	85	6400	700	75
1998	4800	500	48	7500	800	65	5600	620	85	6800	600	70	7100	650	75
1999	7500	640	82	7400	560	70	4800	400	48	6500	525	65	5200	350	55
2000	9500	850	90	8800	920	86	7000	650	70	7800	720	84	6400	540	60
2001	9000	800	70	7200	850	75	8500	950	80	5700	485	60	4500	600	75

1. For which state the average number of candidates selected over the years is the maximum?

- A. Delhi
- B. H.P
- C. U.P
- D. Punjab

Answer: Option A

Explanation:

The average number of candidates selected over the given period for various states are:

$$\text{For Delhi} = \frac{94 + 48 + 82 + 90 + 70}{5} = \frac{384}{5} = 76.8.$$

$$\text{For H.P.} = \frac{82 + 65 + 70 + 86 + 75}{5} = \frac{378}{5} = 75.6.$$

$$\text{For U.P.} = \frac{78 + 85 + 48 + 70 + 80}{5} = \frac{361}{5} = 72.2.$$

$$\text{For Punjab} = \frac{85 + 70 + 65 + 84 + 60}{5} = \frac{364}{5} = 72.8.$$

$$\text{For Haryana} = \frac{75 + 75 + 55 + 60 + 75}{5} = \frac{340}{5} = 68.$$

Clearly, this average is maximum for Delhi.

2. The percentage of candidates qualified from Punjab over those appeared from Punjab is highest in the year?

A. 1997

B. 1998

C. 1999

D. 2000

Answer: Option D

Explanation:

The percentages of candidates qualified from Punjab over those appeared from Punjab during different years are:

$$\text{For 1997} = \left(\frac{680}{8200} \times 100 \right) \% = 8.29\%$$

$$\text{For 1998} = \left(\frac{600}{6800} \times 100 \right) \% = 8.82\%$$

$$\text{For 1999} = \left(\frac{525}{6500} \times 100 \right) \% = 8.08\%$$

$$\text{For 2000} = \left(\frac{720}{7800} \times 100 \right) \% = 9.23\%$$

$$\text{For 2001} = \left(\frac{485}{5700} \times 100 \right) \% = 8.51\%$$

Clearly, this percentage is highest for the year 2000.

3. In the year 1997, which state had the lowest percentage of candidates selected over the candidates appeared?

- A. Delhi
- B. H.P
- C. U.P
- D. Punjab

Answer: Option D

Explanation:

The percentages of candidates selected over the candidates appeared in 1997, for various states are:

$$(i) \text{ For Delhi} = \left(\frac{94}{8000} \times 100 \right) \% = 1.175\%.$$

$$(ii) \text{ For H.P.} = \left(\frac{82}{7800} \times 100 \right) \% = 1.051\%.$$

$$(iii) \text{ For U.P.} = \left(\frac{78}{7500} \times 100 \right) \% = 1.040\%.$$

$$(iv) \text{ For Punjab} = \left(\frac{85}{8200} \times 100 \right) \% = 1.037\%.$$

$$(v) \text{ For Haryana} = \left(\frac{75}{6400} \times 100 \right) \% = 1.172\%.$$

Clearly, this percentage is lowest for Punjab.

4. The number of candidates selected from Haryana during the period under review is approximately what percent of the number selected from Delhi during this period?

- A. 79.5%
- B. 81%
- C. 84.5%
- D. 88.5%

Answer: Option D

Explanation:

$$\begin{aligned}\text{Required percentage} &= \left[\frac{(75 + 75 + 55 + 60 + 75)}{(94 + 48 + 82 + 90 + 70)} \times 100 \right] \% \\ &= \left[\frac{340}{384} \times 100 \right] \% \\ &= 88.54\% \\ &\approx 88.5\%\end{aligned}$$

5. The percentage of candidates selected from U.P. over those qualified from U.P. is highest in the year?
- A. 1997
 - B. 1998
 - C. 1999
 - D. 2001

Answer: Option B

Explanation:

The percentages of candidates selected from U.P. over those qualified from U.P. during different years are:

$$\text{For 1997} = \left(\frac{78}{720} \times 100 \right) \% = 10.83\%$$

$$\text{For 1998} = \left(\frac{85}{620} \times 100 \right) \% = 13.71\%$$

$$\text{For 1999} = \left(\frac{48}{400} \times 100 \right) \% = 12\%$$

$$\text{For 2000} = \left(\frac{70}{650} \times 100 \right) \% = 10.77\%$$

$$\text{For 2001} = \left(\frac{80}{950} \times 100 \right) \% = 8.42\%$$

Clearly, this percentage is highest for the year 1998.

6. What is the approximate percentage of total number of candidates selected to the total number of candidates qualified for all five states together during the year 1999?

- A. 10%
- B. 11%
- C. 12%
- D. 13%

Answer: Option D

Explanation:

$$\begin{aligned}\text{Required percentage} &= \left[\frac{(82 + 70 + 48 + 65 + 55)}{(640 + 560 + 400 + 525 + 350)} \right] \% \\ &= \left[\left(\frac{320}{2475} \times 100 \right) \right] \% \\ &= 12.93\% \\ &\approx 13\%.\end{aligned}$$

**Number of Different Types of
Batteries Sold by a Company Over
the Years (Numbers in Thousands)**

Year	Types of Batteries					Total
	4AH	7AH	32AH	35AH	55AH	
1992	75	144	114	102	108	543
1993	90	126	102	84	126	528
1994	96	114	75	105	135	525
1995	105	90	150	90	75	510
1996	90	75	135	75	90	465
1997	105	60	165	45	120	495
1998	115	85	160	100	145	605

1. What was the approximate percentage increase in the sales of 55AH batteries in 1998 compared to that in 1992?

A. 28%

B. 31%

C. 33%

D. 34%

Answer: Option D

Explanation:

$$\begin{aligned}\text{Required percentage} &= \left[\frac{(145 - 108)}{108} \times 100 \right] \% \\ &= 34.26\% \\ &\approx 34\%.\end{aligned}$$

2. The total sales of all the seven years is the maximum for which battery?

A. 4AH

B. 7AH

C. 32AH

D. 35AH

Answer: Option C

Explanation:

The total sales (in thousands) of all the seven years for various batteries are:

$$\text{For 4AH} = 75 + 90 + 96 + 105 + 90 + 105 + 115 = 676$$

$$\text{For 7AH} = 144 + 126 + 114 + 90 + 75 + 60 + 85 = 694$$

$$\text{For 32AH} = 114 + 102 + 75 + 150 + 135 + 165 + 160 = 901$$

$$\text{For 35AH} = 102 + 84 + 105 + 90 + 75 + 45 + 100 = 601$$

$$\text{For 55AH} = 108 + 126 + 135 + 75 + 90 + 120 + 145 = 799.$$

Clearly, sales are maximum in case of 32AH batteries.

3. What is the difference in the number of 35AH batteries sold in 1993 and 1997?
- A. 24000
 - B. 28000
 - C. 35000
 - D. 39000

Answer: Option D

Explanation:

Required difference = $[(84 - 45) \times 1000] = 39000$.

4. The percentage of 4AH batteries sold to the total number of batteries sold was maximum in the year?

A. 1994

B. 1995

C. 1996

D. 1997

Answer: Option D

Explanation:

The percentages of sales of 4AH batteries to the total sales in different years are:

$$\text{For 1992} = \left(\frac{75}{543} \times 100 \right) \% = 13.81\%.$$

$$\text{For 1993} = \left(\frac{90}{528} \times 100 \right) \% = 17.05\%.$$

$$\text{For 1994} = \left(\frac{96}{525} \times 100 \right) \% = 18.29\%.$$

$$\text{For 1995} = \left(\frac{105}{510} \times 100 \right) \% = 20.59\%.$$

$$\text{For 1996} = \left(\frac{96}{465} \times 100 \right) \% = 19.35\%.$$

$$\text{For 1997} = \left(\frac{105}{495} \times 100 \right) \% = 21.21\%.$$

$$\text{For 1998} = \left(\frac{115}{605} \times 100 \right) \% = 19.01\%.$$

Clearly, the percentage is maximum in 1997.

5. In case of which battery there was a continuous decrease in sales from 1992 to 1997?
- A. 4AH
 - B. 7AH
 - C. 32AH
 - D. 35AH

Answer: Option B

Explanation:

From the table it is clear that the sales of 7AH batteries have been decreasing continuously from 1992 to 1997.

A school has four sections A, B, C, D of Class IX students.

The results of half yearly and annual examinations are shown in the table given below.

Result	No. of Students			
	Section A	Section B	Section C	Section D
Students failed in both Exams	28	23	17	27
Students failed in half-yearly but passed in Annual Exams	14	12	8	13

Students
passed
in half-
yearly
but
failed in
Annual
Exams

6

17

9

15

Students
passed
in both
Exams

64

55

46

76

1. If the number of students passing an examination be considered a criteria for comparison of difficulty level of two examinations, which of the following statements is true in this context?
- A. Half yearly examinations were more difficult.
 - B. Annual examinations were more difficult.
 - C. Both the examinations had almost the same difficulty level.
 - D. The two examinations cannot be compared for difficulty level.

Answer: Option C

Explanation:

Number of students who passed half-yearly exams in the school

= (Number of students passed in half-yearly but failed in annual exams)

$$\begin{aligned}
 &+ (\text{Number of students passed in both exams}) \\
 &= (6 + 17 + 9 + 15) + (64 + 55 + 46 + 76) \\
 &= 288.
 \end{aligned}$$

Also, Number of students who passed annual exams in the school

$$\begin{aligned}
 &= (\text{Number of students failed in half-yearly but passed in annual exams}) \\
 &+ (\text{Number of students passed in both exams}) \\
 &= (14 + 12 + 8 + 13) + (64 + 55 + 46 + 76) \\
 &= 288.
 \end{aligned}$$

Since, the number of students passed in half-yearly = the number of students passed in annual exams. Therefore, it can be inferred that both the examinations had almost the same difficulty level.

Thus Statements (a), (b) and (d) are false and Statement (c) is true.

2. How many students are there in Class IX in the school?

A. 336

B. 189

C. 335

D. 430

Answer: Option D

Explanation:

Since the classification of the students on the basis of their results and sections form independent groups, so the total number of students in the class:

$$\begin{aligned} &= (28 + 23 + 17 + 27 + 14 + 12 + 8 + \\ &13 + 6 + 17 + 9 + 15 + 64 + 55 + 46 + \\ &76) \\ &= 430. \end{aligned}$$

3. Which section has the maximum pass percentage in at least one of the two examinations?

- A. A Section
- B. B Section
- C. C Section
- D. D Section

Answer: Option D

Explanation:

Pass percentages in at least one of the two examinations for different sections are:

$$\text{For Section A } \left[\frac{(14 + 6 + 64)}{(28 + 14 + 6 + 64)} \times 100 \right] \% = \left[\frac{84}{112} \times 100 \right] \% = 75\%.$$

$$\text{For Section B } \left[\frac{(12 + 17 + 55)}{(23 + 12 + 17 + 55)} \times 100 \right] \% = \left[\frac{84}{107} \times 100 \right] \% = 78.5\%.$$

$$\text{For Section C } \left[\frac{(8 + 9 + 46)}{(17 + 8 + 9 + 46)} \times 100 \right] \% = \left[\frac{63}{80} \times 100 \right] \% = 78.75\%.$$

$$\text{For Section D } \left[\frac{(13 + 15 + 76)}{(27 + 13 + 15 + 76)} \times 100 \right] \% = \left[\frac{104}{131} \times 100 \right] \% = 79.39\%.$$

Clearly, the pass percentage is maximum for Section D.

4. Which section has the maximum success rate in annual examination?

- A. A Section
- B. B Section
- C. C Section
- D. D Section

Answer: Option A

Explanation:

Total number of students passed in annual exams in a section

= [(No. of students failed in half-yearly but passed in annual exams)

+ (No. of students passed in both exams)

] in that section

∴ Success rate in annual exams in
Section A

$$\begin{aligned} &= \left[\frac{\text{No. of students of Section A passed in annual exams}}{\text{Total number of students in Section A}} \times 100 \right] \% \\ &= \left[\frac{(14 + 64)}{(28 + 14 + 6 + 64)} \times 100 \right] \% \\ &= \left[\frac{78}{112} \times 100 \right] \% \\ &= 69.64\%. \end{aligned}$$

Similarly, success rate in annual exams in:

$$\text{Section B } \left[\frac{(12 + 55)}{(23 + 12 + 17 + 55)} \times 100 \right] \% = \left[\frac{67}{107} \times 100 \right] \% = 62.62\%.$$

$$\text{Section C } \left[\frac{(8 + 46)}{(17 + 8 + 9 + 46)} \times 100 \right] \% = \left[\frac{54}{80} \times 100 \right] \% = 67.5\%.$$

$$\text{Section D } \left[\frac{(13 + 76)}{(27 + 13 + 15 + 76)} \times 100 \right] \% = \left[\frac{89}{131} \times 100 \right] \% = 67.94\%.$$

Clearly, the success rate in annual
examination is maximum for Section A.

5. Which section has the minimum failure rate in half yearly examination?

A. A section

B. B section

C. C section

D. D section

Answer: Option D

Explanation:

Total number of failures in half-yearly exams in a section

= [(Number of students failed in both exams)

+ (Number of students failed in half-yearly but passed in Annual exams)

] in that section

∴ Failure rate in half-yearly exams in Section A

$$\begin{aligned} &= \left[\frac{\text{Number of students of Section A failed in half-yearly}}{\text{Total number of students in Section A}} \times 100 \right] \% \\ &= \left[\frac{(28 + 14)}{(28 + 14 + 6 + 64)} \times 100 \right] \% \\ &= \left[\frac{42}{112} \times 100 \right] \% \\ &= 37.5\%. \end{aligned}$$

Similarly, failure rate in half-yearly exams in:

$$\text{Section B} \left[\frac{(23 + 12)}{(23 + 12 + 17 + 55)} \times 100 \right] \% = \left[\frac{35}{107} \times 100 \right] \% = 32.71\%.$$

$$\text{Section C} \left[\frac{(17 + 8)}{(17 + 8 + 9 + 46)} \times 100 \right] \% = \left[\frac{25}{80} \times 100 \right] \% = 31.25\%.$$

$$\text{Section D} \left[\frac{(27 + 13)}{(27 + 13 + 15 + 76)} \times 100 \right] \% = \left[\frac{40}{131} \times 100 \right] \% = 30.53\%.$$

Clearly, the failure rate is minimum for Section D.

different categories of employees in a company and also the number of employees from these categories who left the company every year since the foundation of the Company in 1995.

Year	Managers		Technicians		Operators		Accountants		Peons	
	New	Left	New	Left	New	Left	New	Left	New	Left
1995	760	-	1200	-	880	-	1160	-	820	-
1996	280	120	272	120	256	104	200	100	184	96
1997	179	92	240	128	240	120	224	104	152	88
1998	148	88	236	96	208	100	248	96	196	80
1999	160	72	256	100	192	112	272	88	224	120
2000	193	96	288	112	248	144	260	92	200	104

- What is the difference between the total number of Technicians added to the Company and the total number of Accountants added to the Company during the years 1996 to 2000?

- A. 128
- B. 112
- C. 96
- D. 88

Answer: Option D

Explanation:

Required difference

$$\begin{aligned}
 &= (272 + 240 + 236 + 256 + 288) - \\
 &(200 + 224 + 248 + 272 + 260) \\
 &= 88.
 \end{aligned}$$

2. What was the total number of Peons working in the Company in the year 1999?

A. 1312

B. 1192

C. 1088

D. 968

Answer: Option B

Explanation:

Total number of Peons working in the Company in 1999

$$\begin{aligned} &= (820 + 184 + 152 + 196 + 224) - \\ &(96 + 88 + 80 + 120) \\ &= 1192. \end{aligned}$$

3. For which of the following categories the percentage increase in the number of employees working in the Company from 1995 to 2000 was the maximum?

- A. Managers
- B. Technicians
- C. Operators
- D. Accountants

Answer: Option A

Explanation:

Number of Managers working in the Company:

In 1995 = 760.

$$\begin{aligned}\text{In 2000} &= (760 + 280 + 179 + 148 + 160 + 193) - (120 + 92 + 88 + 72 + 96) \\ &= 1252.\end{aligned}$$

∴ Percentage increase in the number of Managers

$$= \left[\frac{(1252 - 760)}{760} \times 100 \right] \% = 64.74\%.$$

Number of Technicians working in the Company:

In 1995 = 1200.

$$\begin{aligned}\text{In 2000} &= (1200 + 272 + 240 + 236 + 256 + 288) - \\ &\quad (120 + 128 + 96 + 100 + 112) \\ &= 1936.\end{aligned}$$

∴ Percentage increase in the number of Technicians

$$= \left[\frac{(1936 - 1200)}{1200} \times 100 \right] \% = 61.33\%.$$

Number of Operators working in the Company:



In 1995 = 880.

$$\begin{aligned}\text{In 2000} &= (880 + 256 + 240 + 208 + 192 + 248) - \\ &\quad (104 + 120 + 100 + 112 + 144) \\ &= 1444.\end{aligned}$$

∴ Percentage increase in the number of Operators

$$= \left[\frac{(1444 - 880)}{880} \times 100 \right] \% = 64.09\%.$$

Number of Accountants working in the Company:

In 1995 = 1160.

$$\begin{aligned}\text{In 2000} &= (1160 + 200 + 224 + 248 + 272 + 260) - \\ &\quad (100 + 104 + 96 + 88 + 92) \\ &= 1884.\end{aligned}$$

∴ Percentage increase in the number of Accountants

$$= \left[\frac{(1884 - 1160)}{1160} \times 100 \right] \% = 62.41\%.$$

Number of Peons working in the Company:

In 1995 = 820.

In 2000 = $(820 + 184 + 152 + 196 + 224 + 200) -$
 $(96 + 88 + 80 + 120 + 104)$
= 1288.

∴ Percentage increase in the number of Peons

$$= \left[\frac{(1288 - 820)}{820} \times 100 \right] \% = 57.07\%.$$

Clearly, the percentage increase is maximum in case of Managers.

4. What is the pooled average of the total number of employees of all categories in the year 1997?

A. 1325

B. 1195

C. 1265

D. 1235

Answer: Option B

Explanation:

Total number of employees of various categories working in the Company in 1997 are:

Managers = $(760 + 280 + 179) - (120 + 92) = 1007$.

Technicians = $(1200 + 272 + 240) - (120 + 128) = 1464$.

Operators = $(880 + 256 + 240) - (104 + 120) = 1152$.

Accountants = $(1160 + 200 + 224) - (100 + 104) = 1380$.

Peons = $(820 + 184 + 152) - (96 + 88) = 972$.

∴ Pooled average of all the five categories of employees working in the Company in 1997

$$= \frac{1}{5} \times (1007 + 1464 + 1152 + 1380 + 972)$$

$$= \frac{1}{5} \times (5975)$$

$$= 1195.$$

5. During the period between 1995 and 2000, the total number of Operators who left the Company is what percent of total number of Operators who joined the Company?

- A. 19%
- B. 21%
- C. 27%
- D. 29%

Answer: Option D

Explanation:

Total number of Operators who left the Company during 1995 - 2000

$$\begin{aligned} &= (104 + 120 + 100 + 112 + 144) \\ &= 580. \end{aligned}$$

Total number of Operators who joined the Company during 1995 - 2000

$$\begin{aligned} &= (880 + 256 + 240 + 208 + 192 + 248) \\ &= 2024. \end{aligned}$$

$$\therefore \text{Required Percentage} = \left(\frac{580}{2024} \times 100 \right) \% = 28.66\% \approx 29\%.$$

The following table gives the percentage distribution of population of five states, P, Q, R, S and T on the basis of poverty line and also on the basis of sex.

State	Percentage of Population below the Poverty Line	Proportion of Males and Females	
		Below Poverty Line	Above Poverty Line
		M : F	M : F
P	35	5 : 6	6 : 7
Q	25	3 : 5	4 : 5
R	24	1 : 2	2 : 3
S	19	3 : 2	4 : 3
T	15	5 : 3	3 : 2

1. If the male population above poverty line for State R is 1.9 million, then the total population of State R is?

- A. 4.5 million
- B. 4.85 million
- C. 5.35 million
- D. 6.25 million

Answer: Option D

Explanation:

Let the total population of State R be x million.

Then, population of State R above poverty line

$$= [(100 - 24)\% \text{ of } x] \text{ million}$$

$$= \left(\frac{76}{100} \times x \right) \text{ million}$$

And so, male population of State R above poverty line

$$= \left[\frac{2}{5} \times \left(\frac{76}{100} \times x \right) \right] \text{ million}$$

But, it is given that male population of State R above poverty line = 1.9 million.

$$\therefore \frac{2}{5} \times \left(\frac{76}{100} \times x \right) = 1.9 \Rightarrow x = \frac{5 \times 100 \times 1.9}{76 \times 2} = 6.25.$$

$\therefore$ Total population of State R = 6.25 million.

2. What will be the number of females above the poverty line in the State S if it is known that the population of State S is 7 million?

- A. 3 million
- B. 2.43 million
- C. 1.33 million
- D. 5.7 million

Answer: Option B

Explanation:

Total population of State S = 7 million.

∴ Population above poverty line

$$= [(100 - 19)\% \text{ of } 7] \text{ million}$$

$$= (81\% \text{ of } 7) \text{ million}$$

$$= 5.67 \text{ million.}$$

And so, the number of females above poverty line in State S

$$= \left(\frac{3}{7} \times 5.67 \right) \text{ million}$$

$$= 2.43 \text{ million.}$$

3. What will be the male population above poverty line for State P if the female population below poverty line for State P is 2.1 million?

- A. 2.1 million
- B. 2.3 million
- C. 2.7 million
- D. 3.3 million

Answer: Option D

Explanation:

Female population below poverty line for State P = 2.1 million

Let the male population below poverty line for State P be x million.

$$\text{Then, } 5 : 6 = x : 21 \Rightarrow x = \frac{2.1 \times 5}{6} = 1.75.$$

$\therefore$ Population below poverty line for State P = $(2.1 + 1.75)$ million = 3.85 million.

Let the population above poverty line for State P be y million.

Since, 35% of the total population of State P is below poverty line, therefore, 65% of the total population of State P is above poverty line i.e., the ratio of population below poverty line to that above poverty line for State P is 35 : 65.

$$\therefore 35 : 65 = 3.85 : y \Rightarrow y = \frac{65 \times 3.85}{35} = 7.15.$$

$\therefore$ Population above poverty line for State P = 7.15 million and so, male population above poverty line for State P

$$= \left(\frac{6}{13} \times 7.15 \right) \text{ million}$$

$$= 3.3 \text{ million.}$$

4. If the population of males below poverty line for State Q is 2.4 million and that for State T is 6 million, then the total populations of States Q and T are in the ratio?

A. 1:3

B. 2:5

C. 3:7

D. 4:9

Answer: Option B

Explanation:

For State Q:

Male population below poverty line = 2.4 million.

Let the female population below poverty line be x million.

$$\text{Then, } 3 : 5 = 2.4 : x \Rightarrow x = \frac{5 \times 2.4}{3} = 4.$$

$\therefore$ Total population below poverty line = $(2.4 + 4) = 6.4$ million.

If N_q be the total population of State Q, then,

$$25\% \text{ of } N_q = 6.4 \text{ million} \Rightarrow N_q = \left(\frac{6.4 \times 100}{25} \right) \text{ million} = 25.6 \text{ million.}$$

For State T:

Male population below poverty line = 6 million.

Let the female population below poverty line be y million.

$$\text{Then, } 5 : 3 = 6 : y \Rightarrow y = \frac{3 \times 6}{5} = 3.6.$$

$\therefore$ Total population below poverty line = $(6 + 3.6) = 9.6$ million.

If N_t be the total population of State T, then,

$$15\% \text{ of } N_t = 9.6 \text{ million} \Rightarrow N_t = \left(\frac{9.6 \times 100}{15} \right) \text{ million} = 64 \text{ million.}$$

$$\text{Thus, Required ratio} = \frac{N_q}{N_t} = \frac{25.6}{64} = 0.4 = \frac{2}{5}.$$

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ከ9-12 ላላችሁ ተማሪዎች

እንደሚታወቀው ከ2015 ዓ.ም ጀምሮ የዩኒቨርሲቲ መግቢያ ፈተና ከ9ኛ-12ኛ ክፍል ያለውን የሚያጠቃልል ነው። ይህም ተማሪዎች ላይ ጫና መፍጠሩ የማይቀር ነው። እኛም ከ2015 ዓ.ም የት/ት ዘመን ጀምሮ በነፃ Mathematics ትምህርትን ከ9ኛ-12ኛ ክፍል ላላችሁ ተማሪዎች Example & Exercise Solution ጨምሮ ቀለል ባለ እና በሚገባችሁ መንገድ ለየት ያሉ YouTube video እያዘጋጀን የምናግዛችሁ መሆኑን ስናሳውቃችሁ በታላቅ እኩብሮት ነው።

ከእናንተ የሚጠበቀው በትኩረት መከታተል ብቻ ነው።

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Mathematics ይከብዳል ማለት እና እስጠኒ መፈለግ ቀረ

Thank You

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