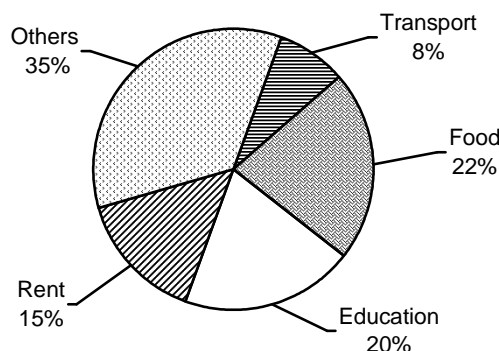


CHAPTER – 3

PIE CHARTS

Worked out Examples:

The following pie chart represents the break up of Raju's monthly expenses.



3.01: If Raju spent ₹4,500 more on food and transport together than he spent on rent, then find his monthly expenses (in ₹).

- (A) 15,000 (B) 25,000
(C) 30,000 (D) 35,000

Sol: Percentage of his expenditure spent on rent = 15%
Percentage of his expenditure spent on transport and food = 30%
∴ 30% – 15% = 15% = ₹4,500
Monthly expenses = 100%

$$= \frac{100}{15} (4500) = ₹30,000 \quad \text{Choice (C)}$$

3.02: If Raju increased his savings, which is currently 10% of his income, by 20% and reduced his expenses by 20%, then his savings would be what percentage of his expenses?

- (A) 10% (B) 12.5%
(C) 15% (D) $16\frac{2}{3}\%$

Sol: Let his monthly income be ₹x

$$\text{Original savings} = ₹ \frac{10}{100} x$$

New savings

$$= \frac{10}{100} x + \frac{20}{100} \left(\frac{10}{100} x \right) = ₹ \frac{12}{100} x$$

$$\text{Original expenditure} = x - \frac{10}{100} x = ₹ \frac{90}{100} x$$

New expenditure

$$= \frac{90}{100} x - \frac{20}{100} \left(\frac{90}{100} x \right) = ₹ \frac{72}{100} x$$

$$\text{Required percentage} = \frac{\frac{12}{100} x}{\frac{72}{100} x} (100) = 16\frac{2}{3}\%$$

Choice (D)

3.03: Raju spent 20% of his expenditure on 'others' on entertainment. This amounted to ₹2,100. Find his expenditure on education.

- (A) 4,500 (B) 5,000
(C) 6,500 (D) None of these

Sol: Expenditure on entertainment = 20% of 35%
= 7% = 2,100
1% = 300

Expenditure on education = 20% = ₹6,000
Choice (D)

3.04: Find the angle made by the expenditure on rent and 'others' put together.

- (A) 120° (B) 160°
(C) 180° (D) 210°

Sol: Total expenditure on rent and 'others'
= 15% + 35% = 50%

$$\text{Required angle} = \frac{50}{100} (360^\circ) = 180^\circ$$

Choice (C)

3.05: As prices dropped, Raju's expenditure on clothes dropped by 10%. As a result of this, his expenditure on 'others' decreased from ₹10,500 to ₹10,290. What percentage of his expenditure on 'others' was spent on clothes?

- (A) 10% (B) 12%
(C) 15% (D) 20%

Sol: Decrease in expenditure on 'others'
= 10,500 – 10,290 = ₹210

∴ Initial expenditure on clothes

$$= 210 \left(\frac{100}{10} \right) = ₹2,100$$

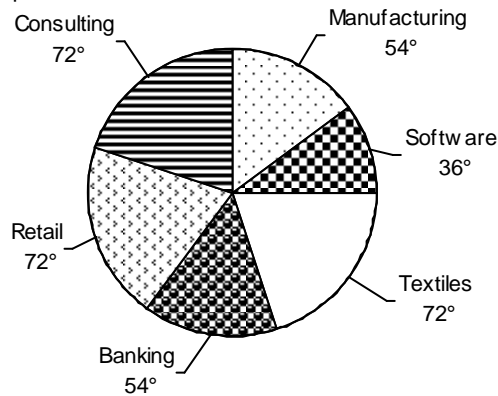
$$\text{Required percentage} = \frac{2100}{10500} (100) = 20\%$$

Choice (D)

Exercise – 3(a)

Directions for questions 1 to 5: These questions are based on the following pie chart.

The following pie chart represents the distribution of the students in a batch of a Business school who got placed in companies in various sectors.

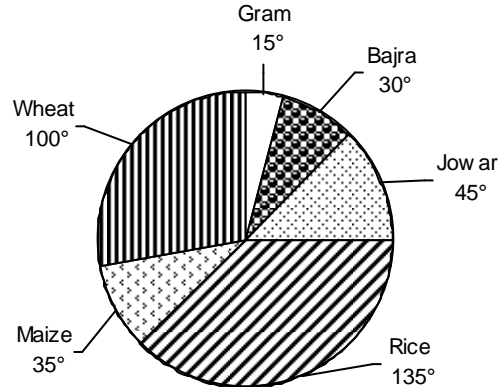


All students of the batch got placed and it is also known that each student got placed in exactly one company and that each company belonged to only one sector.

- What percentage of the total students got placed in the software or the manufacturing sector?
(A) 12.5% (B) 25%
(C) 27.5% (D) 50%
- If the number of students who were placed in the banking sector was 51, then how many students were there in the batch?
(A) 340 (B) 330
(C) 333 (D) 350
- If 25% of the students who were placed in the consulting sector had instead been placed in the retail sector, then what percentage of the total students of the batch would have been placed in the retail sector?
(A) 20% (B) 18%
(C) 25% (D) 33%
- If the number of students who were placed in consulting companies exceeded those placed in software companies by 72, then the number of students in the batch who were placed in manufacturing companies is _____.
(A) 54 (B) 72 (C) 108 (D) 144
- If 20% of the students who got placed in software companies opted out of placements and a new pie chart is drawn for students who accepted placements, then the percentage of the students of the batch who accepted jobs in software companies is (assume that all other students accepted placements) _____.
(A) 7% (B) 7.5%
(C) 7.8% (D) 8.2%

Directions for questions 6 to 10: These questions are based on the following pie chart.

The following pie chart represents the production of major crops in a particular region 'x' in the year 2016.

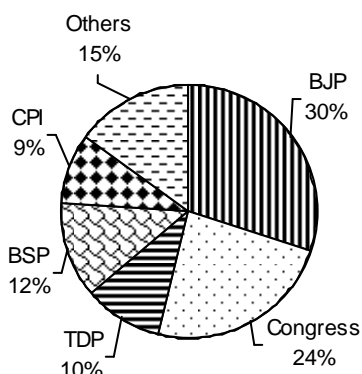


Total production = 72 million tonnes

- If the total production of wheat and rice together in 2016 is 88% more than that in the previous year, then what was the total production (in million tonnes) of wheat and rice in 2015?
(A) 30 (B) 20
(C) 25 (D) 35
- In 2016, by what percentage is the production of rice more than that of wheat?
(A) 30% (B) 25%
(C) 24% (D) 35%
- If in the next year, the production of rice increases by 25% and the total production of crops increases by 15%, then what will be the total production (in million tonnes) of the given crops (except rice) in that year?
(A) 42 (B) 46.35
(C) 48.25 (D) 49.05
- If in 2016, half of the wheat got spoiled due to rain and 25% of the remaining wheat got spoiled due to improper storage, then what would be the approximate angle made by the wheat left, if a new pie chart is drawn, all other values remaining the same?
(A) 37.5° (B) 40.2°
(C) 35.4° (D) 45°
- Due to a mistake, the production of rice in 2016 had been under quoted by 40%. If this mistake is corrected, then wheat contributed what percentage of the production of major crops in that year?
(A) 27.42%
(B) 24.82%
(C) 14.37%
(D) 22.22%

Directions for questions 11 to 15: These questions are based on the following pie chart.

The following pie chart represents the number of votes cast for different political parties in an election in the year 2017. The total number of votes cast in that election is 2,44,000.



Directions for questions 11 to 15: Type in your answer in the input box provided below the question.

11. If the number of votes cast for the BJP is 20% more than that in the previous election, then what is the difference between the number of votes cast for that party in this election and the previous one?

12. If out of the total votes cast for the Congress party, 6000 votes were found to be invalid, then how many valid votes were cast for the party?

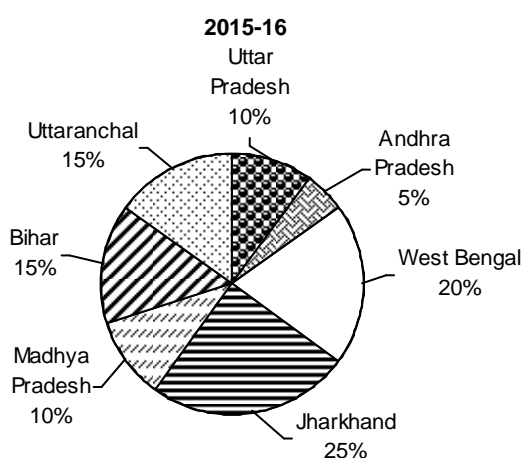
13. By what percentage is the total votes cast for the Congress party more than that for 'Others'?

14. The total number of votes cast for the CPI forms what percentage of the total number of votes cast for the BSP?

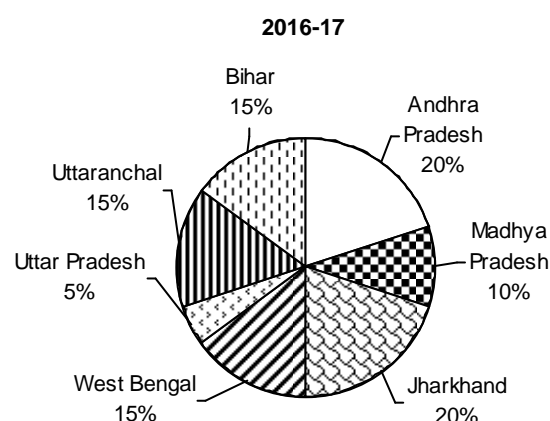
15. If the number of votes cast for the TDP in 2017 is 20% less than that in the previous election, which was 10% of the total votes cast in that year, then how many votes were cast in total in the previous election?

Directions for questions 16 to 20: These questions are based on the following pie charts.

The pie charts give the percentage distribution of iron ore produced in India in 2015-16 and 2016-17.



Total = 720 million tonnes



Total = 1080 million tonnes

16. From 2015-16 to 2016-17, which of the following states showed the maximum percentage increase in the iron ore production?

(A) Andhra Pradesh (B) Madhya Pradesh
(C) Bihar (D) Uttar Pradesh

17. From 2015-16 to 2016-17, which of the following states showed the minimum percentage increase in the iron ore production?

(A) Uttar Pradesh (B) West Bengal
(C) Madhya Pradesh (D) Jharkhand

18. In each of 2015-16 and 2016-17, 40% of the total iron ore production is exported. What is the

percentage increase in the iron ore exported from 2015-16 to 2016-17?

(A) 25% (B) 10% (C) 50% (D) 75%

19. What is the percentage increase in the production of iron ore in Andhra Pradesh from 2015-16 to 2016-17?

(A) 100% (B) 200% (C) 300% (D) 500%

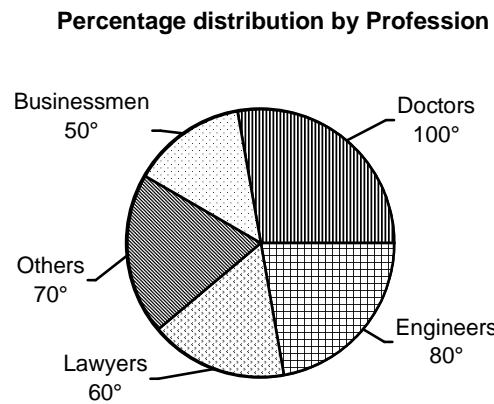
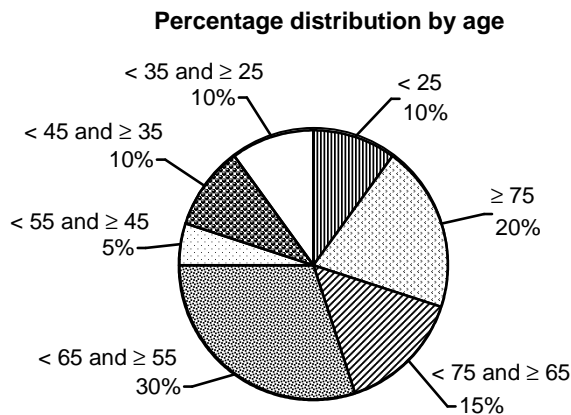
20. In the pie chart for 2016-17, only 50% of the iron ore produced in West Bengal was included, and if a new pie chart is drawn after correcting this, all other values remaining the same, then what percentage of the total iron ore produced in India was produced in West Bengal?

(A) 18% (B) 22% (C) 26% (D) 28%

Exercise – 3(b)

Directions for questions 1 to 5: These questions are based on the following pie charts.

The following pie charts show the results of a survey among working men in a colony.



Total number of men surveyed = 7200

Directions for questions 1 and 2: Type in your answer in the input box provided below the question.

1. How many of the men surveyed were of age 35 years or above?

2. At most what percentage of the businessmen were less than 25 years old?

3. If all men of age 75 years or above were from the same profession, their profession can be
 (A) Businessman
 (B) Engineer

- (C) Doctor
 (D) More than one of the above

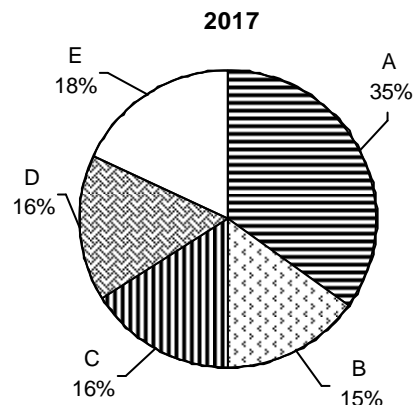
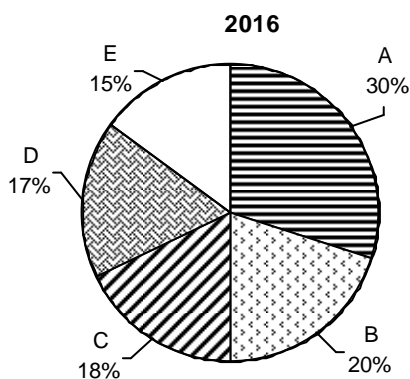
Directions for questions 4 and 5: Type in your answer in the input box provided below the question.

4. If all the engineers were younger than 45 years of age, then at least what percentage of the engineers were of age 35 or above and less than 45 years.

5. At least what percentage of the men were less than 75 years of age and are neither engineers nor doctors?

Directions for questions 6 to 10: These questions are based on the following pie charts.

The two pie charts given below show the distribution of schools, based on the number of students in them, over two years.

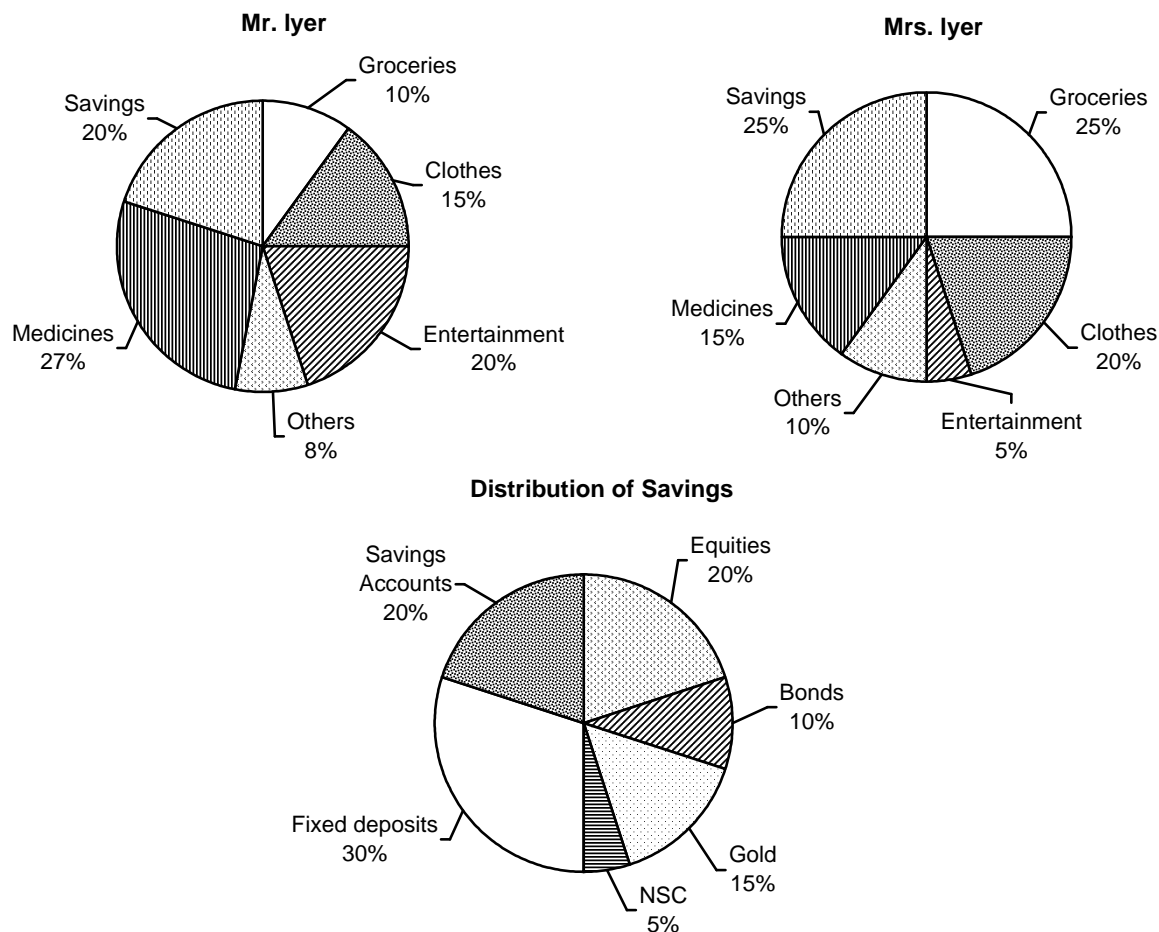


- A = number of schools with one or more but less than 500 students.
 B = number of schools with 500 or more but less than 1000 students.
 C = number of schools with 1000 or more but less than 1500 students.
 D = number of schools with 1500 or more but less than 2000 students.
 E = number of schools with more than or equal to 2000 students.

6. If the number of schools with students ranging from 1000 to less than 1500 in the year 2016 is equal to the number of schools with students ranging from 500 to less than 1000 in 2017, then what is the percentage increase in the total number of schools from 2016 to 2017?
 (A) 16.66% (B) 20%
 (C) 25% (D) 33.33%
7. If the ratio of the total number of schools in 2016 and 2017 is 7 : 8, then for which of the following categories of schools is the percentage change in the number of schools from 2016 to 2017, the highest?
 (A) A (B) B (C) C (D) E
8. In 2016, if there are at the most 50 schools which have less than 500 students, then what is the least number of schools with less than 500 students in 2017, given that the total number of schools in 2017 is greater than that in 2016?
 (A) 58 (B) 63 (C) 70 (D) 120
9. What is the least number of students studying in these schools in the year 2017?
 (A) 83,535 (B) 1,26,685
 (C) 1,51,035 (D) 1,62,500
10. In the year 2017, what is the least difference between the number of students in schools having 1000 or more but less than 1500 students and the number of students in schools having 1500 or more but less than 2000 students?
 (A) 17 (B) 16 (C) 1250 (D) 1561

Directions for questions 11 to 15: These questions are based on the following pie charts.

The pie charts show the distribution of the annual expenses and savings by Mr. and Mrs. Iyer and also the distribution of investment of their combined savings.



The total expenditure on any of the heads and also of the savings is the sum of the values of both the persons on that particular item.

11. If the ratio of the incomes of Mr. and Mrs. Iyer is 4 : 3, then what percentage of their total income is invested in equities?
 (A) 3.82% (B) 4.43%
 (C) 4.78% (D) 5.21%
12. If the total money invested by them in fixed deposits forms 15% of Mrs. Iyer's income, then what is the ratio of the incomes of Mr. and Mrs. Iyer?
 (A) 4 : 5 (B) 3 : 2
 (C) 7 : 5 (D) None of these

13. If the amount spent by Mr. Iyer on clothes is more than that by Mrs. Iyer, then the amount spent by Mr. Iyer on which of the following is definitely more than that by Mrs. Iyer?

(1) Groceries (2) Medicines
(3) Others (4) Entertainment

(A) Only 1 and 2 (B) Only 1, 3 and 4
(C) Only 2, 3 and 4 (D) Only 2 and 3

14. If the amount they invested in equities form 4.55% of their combined total income, then Mrs. Iyer's salary

is what percentage of Mr. Iyer's salary?

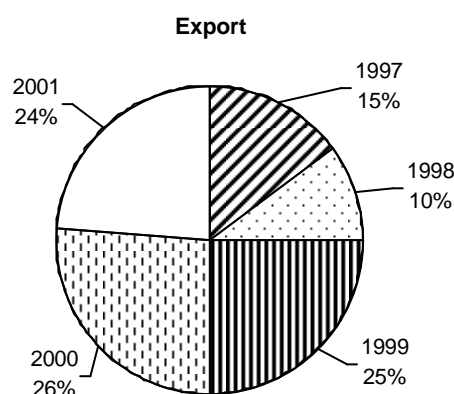
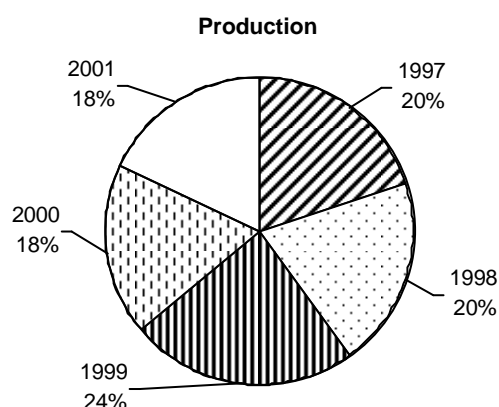
(A) 66.66 (B) 81.81
(C) 122.22 (D) 75

15. If the amount that is invested in savings accounts is the same as what Mr. Iyer spent on groceries, then the ratio of the amounts spent by Mr. and Mrs. Iyer towards entertainment is

(A) 10 : 3 (B) 3 : 1
(C) 5 : 3 (D) 2 : 1

Directions for questions 16 to 20: These questions are based on the following pie charts.

The following pie charts represent the production and export of wheat in the years from 1997 to 2001.



The ratio of quantity of wheat produced to quantity of wheat exported in 1998 is 16 : 3.

16. What is the ratio of the quantity of wheat produced to that exported in 1999?

(A) 64 : 25 (B) 50 : 27
(C) 62 : 27 (D) 54 : 29

17. If the export of wheat in 1999 was 200 million tonnes, then what was the production (in million tonnes) in 1999?

(A) 356 (B) 465
(C) 512 (D) 655

18. The export of wheat in 1997 forms what percentage of the production in that year?

(A) 24.35 (B) 22.15
(C) 26.50 (D) 28.12

19. By what percentage is the export in 2001 more than that in 1998, if the total production of wheat in 1997 was 1024 million tonnes?

(A) 70% (B) 120%
(C) 140% (D) 80%

20. If the production of wheat in 1998 was 1272 million tonnes, then what was the quantity of wheat exported in 1997 (in million tonnes)?

(A) 240.5 (B) 365.2
(C) 425.6 (D) None of these

Key

Exercise – 3(a)

- | | | | | |
|------|------|-----------|------------|-------|
| 1. B | 5. D | 9. D | 13. 60 | 17. B |
| 2. A | 6. C | 10. D | 14. 75 | 18. C |
| 3. C | 7. D | 11. 12200 | 15. 305000 | 19. D |
| 4. C | 8. D | 12. 52560 | 16. A | 20. C |

Exercise – 3(b)

- | | | | | |
|---------|-------|-------|-------|-------|
| 1. 5760 | 5. 30 | 9. A | 13. C | 17. C |
| 2. 72 | 6. B | 10. B | 14. C | 18. D |
| 3. D | 7. D | 11. B | 15. A | 19. C |
| 4. 10 | 8. C | 12. D | 16. A | 20. D |