

3.8

CHAPTER

Pie-Chart

In a Pie-chart

$$100\% \equiv 360^\circ$$

$$1\% = 3.6^\circ$$

or

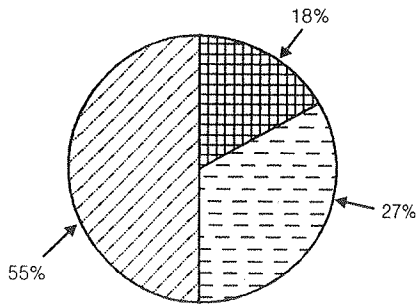
$$1\% = \left(\frac{18}{5}\right)$$

or vice versa

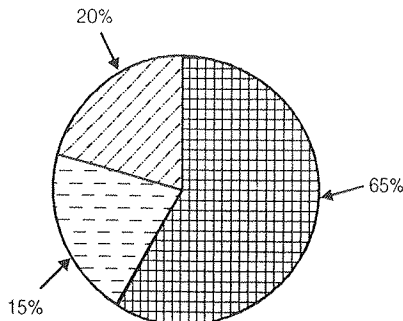
$$1^\circ = \left(\frac{5}{18}\right)\%$$

Pie-Charts are also known as circular charts. It represent data in a very simple and lucid form such that interpretation become easier. Let's have a glimpse of Indian Economy through Pie-Charts.

Pie-Chart:I



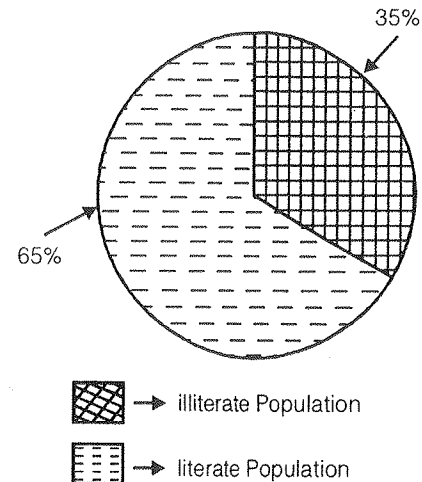
Sectoral Contribution to GDP in Indian Economy (Financial Year 2008-09)



Demographic composition of Indian population living in Urban & Rural areas according to census 2001.

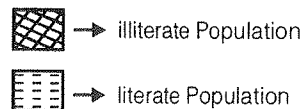
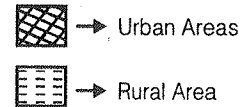
Pie-Chart:III

Work force employed in difference sectors in Indian Economy (Financial Year 2008-09)

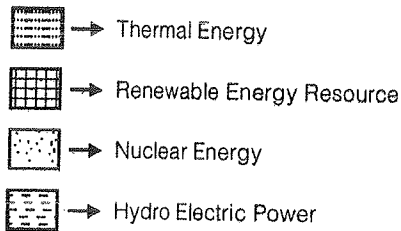
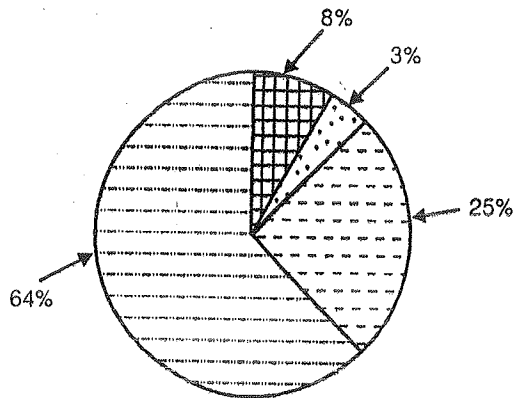


Literacy rates of Indian Population according to census 2001.

where shaded regions for both previous pie chart are represented as below:



Pie-Chart:IV



Source of Power in India
(Installed Capacity)

Pie Chart-I

Shows that major contribution to GDP of Indian Economy is the share of services [Tertiary Sector] is 55% yet number of people employed in this sector is merely 20%. Share of agriculture is merely 18% yet approximately two third of population is still dependent on agriculture to support their livelihood. Contribution of industries is 27% and approximately 15% people are employed in industries.

Pie Chart-II

It shows that more than 2/3 of our population are living in rural areas. Urban population is still less than 1/3. It need urgent attention to provide facilities of urban amenities in rural areas. Rural development should be given top most priority.

Pie Chart-III

Literacy rate is shown in pie chart III. It reveals that more than one-third of population do not know how to read and write. We need more resources and constitutional power to local bodies and state government so that they can increase their efforts to improve literacy rates.

Pie Chart-IV

It shows composition of different resources for power generation. We are still dependent much on Thermal Power to fulfil over energy demands. Nuclear energy and renewable resources of energy contributes merely 3% and 8% respectively.

Pie-Chart

There are two type of Pie Charts

1. Pie-Charts represented in Angular form
2. Pie-Charts represented in percent form

Conversion

$$\therefore 100\% = 360^\circ$$

$$\therefore 1\% = \frac{360}{100} = 3.6^\circ$$

Similarly

$$\therefore 360^\circ = 100\%$$

$$\therefore 1^\circ = \frac{100}{360} = \left(\frac{10}{36}\right)\%$$

Let us have an example on Angular form.

Example-I

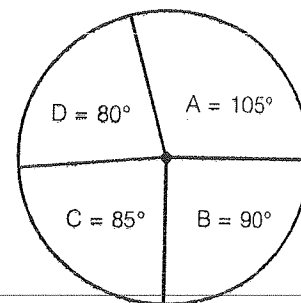


Fig. 5

Sectionwise composition of 720 students in a class in MADE EASY

From above pie chart we can answer following questions.

1. Students in section A is how many percent more than that in section B?

Sol. Section A = 105°
Section B = 90°

$$\Rightarrow \frac{105 - 90}{90} \times 100$$

$$\Rightarrow \frac{15}{90} \times 100$$

$$\Rightarrow 16.66\% \text{ Ans.}$$

2. Students in section A is how many times than that of students in section D?

Sol. Students in A = 105°

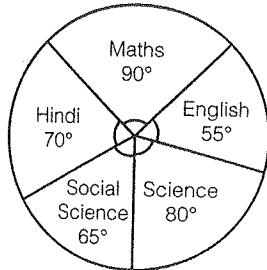
Students in D = 80°

$$\frac{105}{80} = \frac{21}{16} = 1.3125 \text{ Ans.}$$



Practice Exercise: I

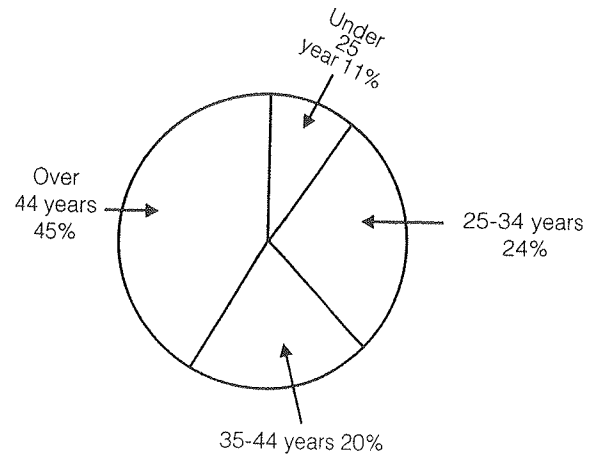
Direction (Qs. 1 to 6): These questions are to be answered on the basis of the following pie chart, which gives marks scored by a student in different subjects—English, Hindi, Mathematics, Science and Social Science in an examination. Assuming that the total marks obtained for the examination are 540 answer the following questions:



- The marks scored by the student in Hindi and Mathematics exceed the marks scored in English and Social Science by
(a) 60 (b) 75
(c) 40 (d) 30
- The subject in which the student scored approx 22.2% marks is
(a) Hindi (b) Science
(c) Social Science (d) English
- The subject in which the student scored 105 marks is
(a) Mathematics (b) Hindi
(c) Science (d) Maths
- The marks obtained in the three subjects : English, Science and Social Science are what percentage of the total?
(a) 45% (b) $44\frac{4}{9}\%$
(c) 55% (d) $55\frac{5}{9}\%$
- The marks obtained in Mathematics are what percentage of the total marks?
(a) 20% (b) 30%
(c) 35% (d) 25%
- The difference of marks between English and Social Science is the same as between
(a) Science and Hindi
(b) Hindi and Social Science
(c) English and Hindi
(d) Social Science and Science

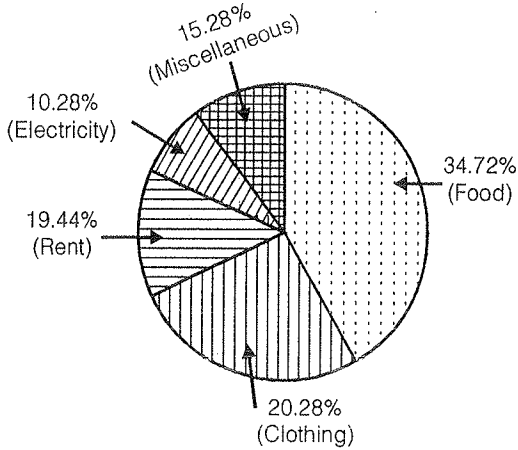
Direction (Qs. 7 to 11): Use the following chart to answer these questions on the age-wise distribution of personal income of a country in the year 2002.

Rs. 2499.4 Billions = 100%



- In 2002, what was the approximate personal income, in billions of rupees, of the age-group 35-44 years?
(a) 500 (b) 600
(c) 1125 (d) None of these
- About how many degrees are there in the central angle devoted to the personal income of the age group 35-44
(a) 20 (b) 40
(c) 72 (d) None of these
- What is the ratio of the personal income of the age group 25-34 to that of the age-group 35-44?
(a) 9 : 4 (b) 5 : 6
(c) 8 : 15 (d) None of these
- If the total income in 2002 was 20 percent greater than it was in 2000, then what was the approximate total personal income in 2000 (in billions of rupees)?
(a) 2200 (b) 2100
(c) 2000 (d) None of these
- If the total income in the year 2007 is projected to be one-and-a-half time of its current size in 2002, then what is the assumed annual compound rate of growth in income (in percent)?
(a) 20 (b) 25
(c) 15 (d) None of these

Direction (Qs. 12 to 16): These questions are based on the following pie chart showing percentage of money spend on household items by a representative family :



Total students : 1200
(800 girls + 400 boys)

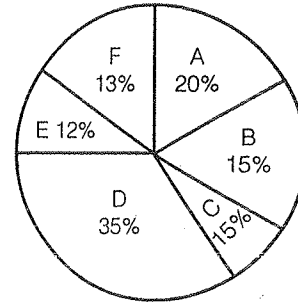


Chart-I

12. The ratio between the money spent on Rent and Food is

- (a) 1 : 2 (b) 7 : 5
(c) 14 : 25 (d) None of these

13. If the income of a family is Rs. 12000 p.m. then the difference between the expenditure (in rupees) on Clothing and Electricity is nearly

- (a) 8700 (b) 4400
(c) 3300 (d) None of these

14. If the income of a family is Rs. 20,000 p.m. then the ratio of the expenditure on Rent and Miscellaneous items is

- (a) 3 : 2 (b) 7 : 5
(c) 7 : 6 (d) None of these

15. If the Income of a family increase by Rs. 1000 p.m., then the, amount spent (in rupees) on Electricity should increase by nearly

- (a) 100 (b) 200
(c) 300 (d) 400

16. If the income of a family is Rs. 8000 p.m., then the approximate difference of the expenditure on Electricity and Miscellaneous items in percent terms.

- (a) 18 (b) 12
(c) 5 (d) None of these

Direction (Qs. 17 to 21): Study the following information to answer the given questions.

Percentage of total students in various courses (A,B,C,D,E,F) in the pie chart-I and percentage of girls in pie Chart-II

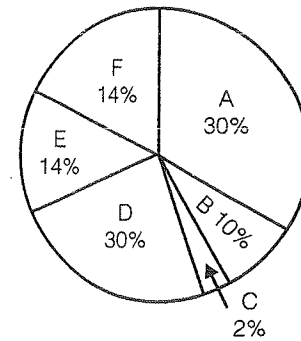


Chart-II

17. For course D, what is the ratio of boys and girls?

- (a) 3 : 4 (b) 4 : 5
(c) 3 : 5 (d) 5 : 6

18. For which pair of course is the number of boys the same?

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

19. For course E, the number of girls is how much per cent more than the number of boys for course E?

- (a) 250 (b) 350
(c) 150 (d) 80

20. For which course is the number of boys the minimum?

- (a) E (b) F
(c) C (d) A

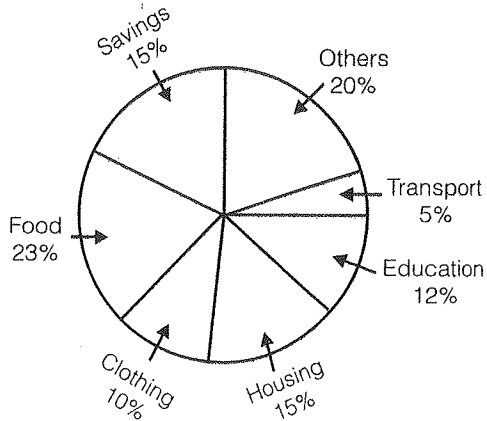
21. How many girls are there in course C?

- (a) 44 (b) 16
(c) 40 (d) 160

Direction (Qs. 22 to 26): The pie chart represented below shows the spending by a family on various items

during the year 1999. Study the graph and answer these questions.

Percent of money spent by a family on various items during 1999



22. If the total amount spend during the year 1999 was Rs. 46000, the amount spent on food was
 (a) Rs. 2000 (b) Rs, 10580
 (c) Rs. 23000 (d) Rs. 2300
23. If the total amount spend was Rs 46000, how much money was spent on clothing and housing together?
 (a) Rs. 11500 (b) Rs. 1150
 (c) Rs. 10000 (d) Rs. 15000
24. The ratio of the total amount of money spent on housing to that spent on education was
 (a) 5 : 2 (b) 2 : 5
 (c) 4 : 5 (d) 5 : 4
25. Graph shows that the maximum amount was spent on
 (a) Food (b) Housing
 (c) Clothing (d) Others
26. If the total expenditure of the family for the year 1999 was Rs. 46000, the family saved during the year
 (a) Rs. 1500 (b) Rs. 15000
 (c) Rs. 6900 (d) Rs. 3067 approx

□□□□

Solutions

Answer 1 to 5:

1. (a) Marks scored in Hindi and Maths

$$= \frac{160}{360} \times 540 = 240$$

Marks scored in English and Social Science

$$= \frac{120}{360} \times 540 = 180.$$

2. (b) $100\% = 360^\circ$

$$22.2\% = \frac{360}{100} \times 22.2 = 79.92^\circ = 80^\circ$$

Hence difference is

$$240 - 180 = 60.$$

3. (b) $540 = 360^\circ$

$$105 = \frac{360}{540} \times 105 = 70^\circ.$$

4. (d) $360^\circ = 100\%$

$$200^\circ = \frac{100}{360} \times 200 = 55\frac{5}{9}\%.$$

5. (d)

6. (d)

7. (a) 20% of 2499.4 billions

$$= \frac{2499.4}{5} = 499.88 \approx 500 \text{ billion.}$$

8. (c)

9. (d) Required ratio $24 : 20 = 6 : 5$

10. (b) Total personal income in 2002 = 2499.4 billion

Total personal income in 2000 = x , say

$$\therefore x + 20\% \text{ of } x = 2499.4$$

$$\Rightarrow x = \frac{5}{6} \times 2499.4 = 2082.83 = 2100.$$

11. (d) Total income project in the year 2007 = 150, when the income in the year 2002 was 100.

\therefore Annual compound rate of growth is 8.5%

12. (c) Ratio between the money spent on rent and food

$$= \frac{19.44}{34.72} = \frac{1944}{3472} = \frac{14}{25}$$



Practice Exercise: II

13. (d) Expenditure on clothing
= 20.28% of Rs. 12000 = Rs. 2433.60
Expenditure on electricity
= 10.28% of 12000 = Rs. 1233.60
= Required difference = Rs. 1200.

Alternative

Difference of expenditure on clothing & Electricity is

$$20.28\% - 10.28\% = 10\%$$

$$10\% \text{ of } 12000$$

$$= \text{Rs. } 1200 \text{ Ans.}$$

14. (d) Required ratio = $\frac{19.44}{15.28} = 1.27$,

Whatever the family income may be

15. (a) Amount on electricity will increase by
Rs. 102.80 = Rs. 100.

16. (c) Required difference will be 15.28% - 10.28%
= 5%, irrespective of family income.

17. (a) Total no. of students for course D = 35% of 1200
= 420

$$\text{No. of girl students for course D} = 30\% \text{ of } 800 = 240$$

$$\text{No. of boy students for course D} = 420 - 240 = 180$$

$$\text{Reqd. ratio} = 180 : 240 = 3 : 4$$

18. (c) No. of boys for different courses are
A = 0; B = 100; C = 44; D = 180; E = 32; F = 44.
Hence C & F are same.

19. (a) Total students for E = 12% of 1200 = 144
No. of girls for course E = 14% of 800 = 112
So No. of boys for course E = 32

$$\text{Reqd more \%} = \frac{112 - 32}{32} \times 100 = 250\%$$

20. (d) Using the information given in Q. No. (ii)

21. (b) No. of girls in course C = 2% of 800 = 16.

22. (b) 23% of 46000 = Rs. 10580

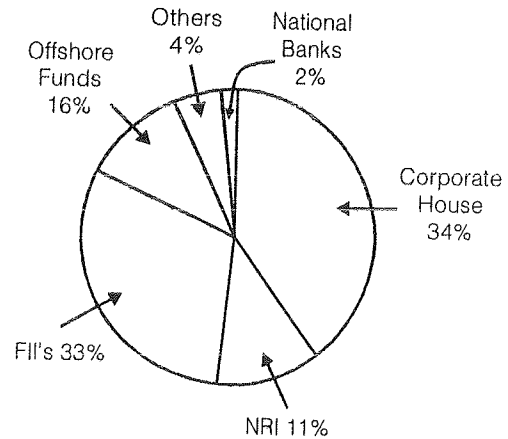
23. (a) 25% of 46000 = Rs. 11500

24. (d) Required ratio = 15 : 12 = 5 : 4

25. (a) 23% are food.

26. (c) 15% of 46000 = Rs. 6900

Direction (Qs. 1 to 7): The following pie chart shows the amount of subscription generated for the India Bonds from different categories of investors.



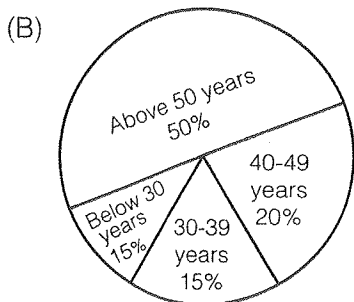
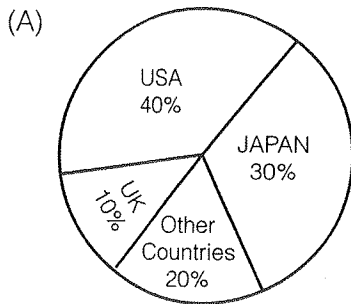
- If the investments by NRI's are Rs. 4,000 crore, then the investment by corporate houses and FII's together is:
(a) 24,000 crore (b) 24,363 crore
(c) 25,423.4 crore (d) 25,643.3 crore
- What percentage of the total investment is coming from either FIIs or NRIs?
(a) 33% (b) 11%
(c) 44% (d) 22%
- If the total investment other than by FII and corporate house is Rs 335,000 crore, then the investment by NRIs and Offshore funds will be (approximately) :
(a) 274,100
(b) 285,600
(c) 293,000
(d) Can't be determined
- What is the approximate ratio of investment flows into India Bonds from NRIs to corporate houses?
(a) 1 : 4
(b) 1 : 3
(c) 3 : 1
(d) Can't be determined
- In the corporate sector, approximately how many degrees should be there in the central angle?
(a) 120 (b) 121
(c) 122 (d) 123
- If the total investment flows from FII's were to be doubled in the next year and the investment flows

from all other sources had remained constant at their existing levels for this year, then what would be the proportion of FII investment in the total investment flows into India Bonds in the next year (Approximately)?

- (a) 40%
- (b) 50%
- (c) 60%
- (d) Can't be determined

7. If the inflow from the FIIs after the doubling (as given in Question 6) were approx US\$ 500 million what would be the total investment into India Bonds next year (in US\$ millions)
- (a) 1000
 - (b) 1500
 - (c) 800
 - (d) Can't be determined

Direction (Qs. 8 to 11): (A) and (B) exhibit the out flow of the tourist traffic from India. The two charts show the tourist distribution by country (A) and the age wise (B) traffic of the tourist respectively. Study the charts carefully and answer the question which flow.



8. What percentage of the India tourist out flow to either USA or UK?
- (a) 40%
 - (b) 50%
 - (c) 60%
 - (d) 70%
9. The ratio of the number of Indian tourists that went to USA to the number of Indian tourists who were below 30 years of age is:

- (a) 2 : 1
- (b) 8 : 3
- (c) 3 : 8
- (d) Can't be determined

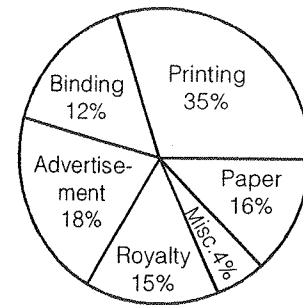
10. If amongst other countries, Switzerland accounted for 25% of the Indian tourist traffic, and it is known from official Swiss records that a total of 25 lakh Indian tourist had gone to Switzerland during the year, then find the number of 30-39 years-old Indian tourists who went abroad in that year.

- (a) 18.75 lakh
- (b) 25 lakh
- (c) 50 lakh
- (d) 75 lakh

11. For Question 10, what was the volume of traffic of Indian tourists in the US?

- (a) 150 lakh
- (b) 125 lakh
- (c) 200 lakh
- (d) None of these

Direction (Qs. 12 to 16): Pie Chart given below shows the expenditure incurred in bringing out a book by a publisher



Study the graph carefully and answer the questions given below:

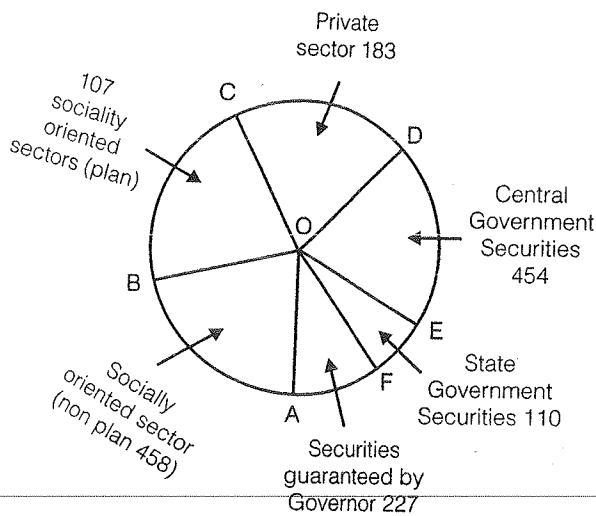
12. What is the central angle of the sector for the cost of the paper?
- (a) 22.5°
 - (b) 16°
 - (c) 54.8°
 - (d) 57.6°
13. If the cost of printing is Rs. 17500, the royalty is:
- (a) Rs. 8750
 - (b) Rs. 7500
 - (c) Rs. 3150
 - (d) Rs. 6300
14. If the miscellaneous charges are Rs. 9000, the advertisement charges are:
- (a) Rs. 13500
 - (b) Rs. 20000
 - (c) Rs. 40500
 - (d) Rs. 1800
15. If 5500 copies are published and miscellaneous expenditure on them amount to Rs. 5544 and the publisher earns a profit of 25%, then marked price of each copy is

- (a) Rs. 25.20 (b) Rs. 37.50
 (c) Rs. 31.50 (d) Rs.30

16. Royalty on the book is less than the advertisement charges by:

- (a) 3% (b) $16\frac{2}{3}\%$
 (c) 20% (d) None of these

Direction (Qs. 17 to 21): The gross investment of Life Insurance Corporation of India (in crores of rupees) in different sectors are shown in the pie chart given below :



On the basis of the above information answer the following questions.

17. The percentage of gross investment in States Government Securities is nearly :
 (a) 7.1% (b) 7.8%
 (c) 8.6% (d) 9.2%
18. The magnitude of $\angle AOC$ is nearly :
 (a) 103° (b) 132°
 (c) 126° (d) 115°
19. The investment in socially oriented sectors (plan and non plan) is than the investment in Government securities (Central and State) by ...
 (a) More, 4 crore (b) More, 1 crore
 (c) More, 111 crore (d) Less, 106 crore
20. The investment in private sectors is nearly... percent higher than the investment in State Government Securities?
 (a) 66 (b) 54
 (c) 46 (d) 40

21. The ratio of the area of the circle above COF to the area of the circle below it is, nearly :
 (a) 1 (b) 0.966
 (c) 0.94 (d) 0.92

□□□□

Solutions

Answer 1 to 5 :

- (b) $(67/11) \times 400$ crore
- (c) $33\% + 11\% = 44\%$
- (a) Investment other than NRI and corporate houses is $33\% = 335000$. Also, investment by offshore funds and NRIs is equal to 27%. Hence,

$$27 \times \frac{335,000}{33} = 274100$$
- (b) $11 : 34$ is approximately equal to $1 : 3$
- (c) $34 \times 3.6 = 122.4$ (since $1\% = 3.6$ degrees).
- (b) FII's currently account for 33 out of 100. If their value is doubled and all other investments are kept constant then their new value would be 66 out of 133 which is approximately equal to 50%
- (a) 500 million would be approximately 50% of the total investment. Then 1000 will be the total investment.
- (b) $40 + 10 = 50\%$ (from the first chart)
- (b) $40 : 15 = 8 : 3$
- (d) 5% corresponds to Switzerland's 25 lakh. Hence 15% will be 75 lakh
- (c) US account for 40%, i.e., 8 times 5%. Since, Switzerland's 5% is 25 lakh, US will be 200 lakh
- (d) Central angle for the cost of the paper

$$= \left(\frac{16}{100} \times 360 \right)^\circ = 57.6^\circ.$$
- (b) Let the royalty be Rs. x . Then
 $35 : 15 :: 17500 : x$

$$x = \left(\frac{15 \times 17500}{35} \right) = \text{Rs. } 7500$$

14. (c) Let the advertisement charges be Rs. x .

$$\text{The, } 4 : 18 :: 9000 : x \text{ or } x = \left(\frac{18 \times 9000}{4} \right)$$

= Rs. 40500.

15. (c) Let the total charges be Rs. x .

Then, $4 : 100 :: 5544 : x$ or x

$$= \left(\frac{18 \times 5444}{4} \right) = \text{Rs. } 138600.$$

∴ Total cost = Rs. 138600.

∴ Cost price of each copy

$$= \text{Rs. } \left(\frac{138600}{5500} \right) = \text{Rs. } 25.20.$$

∴ Marked price = 125% of Rs. 25.20

$$= \text{Rs. } \left(\frac{125}{100} \times 25.20 \right) = \text{Rs. } 31.50$$

16. (b) Let royalty be Rs. 15. Then, advertisement charges = Rs. 18.

$$\therefore \text{Required percentage} = \left(\frac{3}{18} \times 100 \right) \% = \text{Rs.}$$

31.50

17. (a) Total investment = $(458 + 107 + 183 + 454 + 110 + 227)$ crores

$$\therefore \text{Required percentage} = \left(\frac{110}{1539} \times 100 \right) \%$$

= 7.1%

$$18. (b) \angle AOC = \left[\frac{(458 + 107) \text{ crores}}{1539 \text{ crores}} \right]$$

$$= \left(\frac{565}{1539} \times 360 \right) = 135^\circ.$$

19. (b) Investment in socially oriented sectors

$$= (458 + 107) \text{ crores} = 565 \text{ crores.}$$

∴ Investment in socially oriented sectors is more than investment in Government securities by 1 crore.

20. (a) Investment in Private Sector = 183 crores.

Investment in State Government Securities = 110 crores.

$$\therefore \text{Required excess} = \left(\frac{73}{110} \times 100 \right) \%$$

= 66%

21. (c) Required Ratio

$$= \frac{(183 + 454 + 110)}{107 + 458 + 227} = \frac{747}{792}$$

$$\Rightarrow \frac{83}{88} = 0.943$$

