SuperGrads Study Material

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QUANTITATIVE ABILITY

TOP 20 QUESTIONS OF PERCENTAGES FOR DU JAT & IPM

1. According to the 2001 census, the population growth rate of Lucknow is going to be an increasing AP with first year's rate as 5% and common difference as 5% but simultaneously the migration, rate is an increasing GP with first term as 1% and common ratio of 2. If the population on 31 December 2000 is 1 million, then find in which year will Lucknow witness its first fall in population?
(a) 2006 (b) 2007 (c) 2008 (d) 2009

2. In a financial year, company increases its production by 30% and profit is increased by 20% per unit, Every year, the company donated a part of the profit to a charity. Since the profit is increased this time, the part of the profit donated to charity was increased by 25%. The number of beneficiaries in the charity has increased by 50% how much percentage is the money donated per head more than the previous year?
(a) 20% (b) 25% (c) 30% (d) 50%

3. Pannalal earns 50% profit in one year and donates 50% of total capital (initial capital + Profit) to charity. Same pattern was followed during 2nd and 3rd year. At the end of third year, he is left with Rs. 16,875, then find the amount donated by him at the end of the 2nd year.
(a) Rs. 45,000 (b) Rs. 12,500 (c) Rs. 22,500 (d) Rs. 20,000

4. The number of votes not cast for the Praja Party increased by 25% in the National General Election over those not cast for it in the previous Assembly Polls, and the Praja Party lost by a majority twice as large as that by which it had won the assembly Polls. If a total 2,60,000 people voted each time, how many voted for the Praja Party in the previous Assembly Polls?
(a) 1,10,000 (b) 1,15,000 (c) 1,40,000 (d) 1,20,000

5. One bacterium split into eight bacteria of the next generation, but due to environment, only 50% of one generation can produce the next generation. If the seventh-generation number is 4096 million, what is the number of bacteria in first generation?
(a) 1 Million (b) 2 Million (c) 4 Million (d) 8 Million

6. The owner of an art shop conducts his business in the following manner: Every once in a while, he raises his prices by X%, then a while later he reduces all the new prices by X%. After one such up down cycle, the price of a painting decreased by Rs. 441. After a second up-down cycle the painting was sold for Rs. 1944.81. What was the original price of the painting?
(a) Rs 2,756.25 (b) Rs 2,256.25 (c) Rs 2,500 (d) Rs 2,000

7. Population of city increase by 10% every year (successively). In how many years the population will become more than double of original population for the first time.
(a) 8 Years (b) 9 years (c) 10 years (d) 11 years

8. In 2010, a library contained a total of 11500 books in two categories – fiction and nonfiction. In 2015, the library contained a total of 12760 books in these two categories. During this period, there was 10% increase in the fiction category while there was 12% increase in the non-fiction category. How many fiction books were in the library in 2015?
(a) 6600 (b) 6160 (c) 6000 (d) 5500

9. In an examination, Rama's score was one-twelfth of the sum of the scores of Mohan and Anjali. After a review, the score of each of them increased by 6. The revised scores of Anjali, Mohan, and rama were in the ratio 11:10:3. Then Anjali's score exceeded Rama's score by?
(a) 35 (b) 40 (c) 32 (d) 24

10. A man spends 28% of his salary on food. From the remaining he spent 1/6th on rent and sends 3/8th to his mother. If he left with Rs 5280, what amount he sends to his mother.
(a) Rs. 4230 (b) Rs. 4320 (c) Rs. 4580 (d) Rs. 4420

11. In order to maximize his gain, a theatre owner decides to reduce the price of tickets by 20% and as a result of this, the sales of tickets increase by 40%. if, as a result of these changes, he is able to increase his total collection by Rs. 84,00, find his original price of a ticket if he initially used to sell 140 tickets?
(a) 500 (b) 1000 (c) 240 (d) 250

12. At lotus School, 60% of the students are boys and the rest are girls. Further 15% of the boys and 7.5% of the girls are getting a fee waiver. If the number of those getting a fee waiver is 90, find the total number of students getting 50% concession if it is given that 50% of those not getting a fee waiver are eligible to get half the concession?
(a) 360 (b) 280 (c) 320 (d) 330

13. If the income tax is increased by 19% the net income is reduced by 6%. The rate of income tax is:
(a) 24% (b) 20% (c) 25% (d) 23%

14. Fresh fruit contains 68% water and dry fruit contains 20% water. How much dry fruit can be obtained from 100 kgs of fresh fruits?
(a) 32 Kgs (b) 40 Kgs (c) 52 Kgs (d) 80 Kgs

15. If first number is 8.33% less than third number and ratio of second and third number is 15:16 then average of first and third number is how much percent less/More than second number?
(a) 2.66% (b) 2.22% (c) 3.33% (d) 2.45%

16. In a tringle base is increased by 32% and corresponding height is decreased by $18\frac{2}{11}\%$, Area of triangle is increased by 324 cm^2then find the increased area of triangle?
(a) 4374 (b) 8748 (c) 7148 (d) 10368

17. Volume of a cylinder is increased by 43% when its height is reduced by $15\frac{5}{13}\%$ then find % change in CSA of cylinder?
(a) 15% (b) 13% (c) 10% (d) 12%

18. In a party only couples are invited. If $44\frac{4}{9}\%$ of invited people are vegetarian and 60% of males are non-vegetarian, then find the number of fathers, if 20% of males have children (it is given that 920 women are non-vegetarian).
(a) 360 (b) 270 (c) 315 (d) 450

19. A's income is $57\frac{1}{7}\%$ of B's income. If A's income is 525% more than B's savings and A's savings is 16.66% of B's expenditure. If difference between A's savings and B's savings is Rs. 315. Then find the Average income of A and B?
(a) 3712.5 (b) 3850 (c) 4125 (d) 4950

20. Expenditure on wheat of a family is 28.56% less than rice, expenditure on rice 12.5% less than pulse. If expenditure on wheat, rice and pulse are increased by 9.5%, 17.5% and 12.5% respectively and total expenditure is increased by Rs. 540. Then find total income of family if other than this expenditure family saves Rs. 500.
(a) Rs. 4500 (b) Rs. 3500 (c) Rs. 5500 (d) Rs. 4000

EXPLANATION

1. **(a)** Population growth rate according to the problem
Year 1 = 5%
Year 2 = 10%
Year 3 = 15%
Year 4 = 20%
Year 5 = 25%
Year 6 = 30%
Population decrease due to migration
Year 1 = 1%
Year 2 = 2%
Year 3 = 4%
Year 4 = 8%
Year 5 = 16%
Year 6 = 32%
Thus, the first fall would happen in year 2006

2. **(c)**

Product	Profit loss	Total profit	Charity	Beneficiary	Per head (Charity)
10	10	100	40% = 40	2	40/2 = 20
13	12	156	50% = 78	3	78/3 = 26

Required % change $= \frac{6}{20} \times 100 = 30\%$

3. **(c)** Let us assume the initial amount be 64 Now, according to Question,
1st year $64 \frac{+50\%}{+32} = 96 \frac{-50\%}{-48} = 48$
2nd year $48 \frac{+50\%}{+24} = 72 \frac{-50\%}{-36} = 36$ (required value)
3rd year $36 \frac{+50}{18} = 54 \ \frac{-50\%}{-27} = 27$ (left)
$\because$ 27 Unit $= 16875$
1 Unit = 625
36 Unit = 625 × 36 = 22500

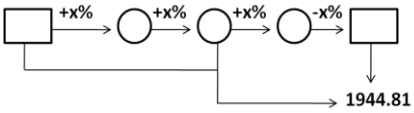
4. **(c)** In this problem, if we go through traditional method, then it will take lot of time, but if we take the help of option then, we get our answer fast. Now according to question praja party won the pronouns assembly poll, & for winning more then 50% of total votes is required So, in that case option A & B is eliminate do now, currently we have two option (option B & C). Check anyone of them, if it satisfy the given condition then it is our answer otherwise other option is our answer.
Let check with option C

P.P	Other party	
140000	120000	Difference = 20,000 (+25% increase $= \frac{1}{4} \uparrow (30{,}000)$)
1,10,000	1,50,000	Difference = 40,000

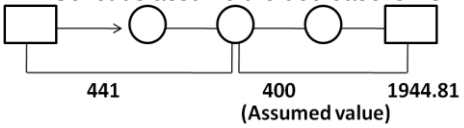
So by taking 1,40,000 it satisfy required condition so correct answer is 1,40,000

5. **(a)** Let the no' of bacteria in first generation be x.
$x \xrightarrow{\times 4} 4x \xrightarrow{\times 4} 4^2x \ldots\ldots \rightarrow 4^6x$
$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$
$1stgen \quad 2\,ndgen \quad 3rdgen \quad 7\text{ th gen}$
Now it is given that, the 7th generation number is 4096 million
Then $4^6x = 4096 = 2^{12} = (2^2)^6$
$4^6x = 4^6$,million
$x = 1$ million

6. **(a)** In this problem if we go through traditional method then it will take lot of time. So we use smart approach to solve this problem



If after one such cycle up-down cycle, the price of a painting decreased by Rs. 441, then the decrease in amount in 2nd up-down cycle is near about Rs 441. So let us assume the decrease is Rs 400 Then



The required answer is near about $\begin{array}{r} 1944.84 \\ +441 \\ +400 \\ \hline 2785.81 \end{array}$
So, correct answer is Rs. = 2756.25

7. **(a)** In one year population is increase by 10% so population become 1.1 time of original population, after two year it become 1.21 times of original population.
Now, 1.1 × 1.1 = 1.21 (2 years)
$1.21 \times 1.21 = 1.464$ (4 years)
$\downarrow \quad \downarrow$
2 year 2 year
$1.464 \times 1.464 > 1.96\ (1.4 \times 1.4)$
$\downarrow \quad \downarrow$
4 year 4 year
So, in 8 years population become more than double of original for the first time.

8. **(a)** Total books in Library
2010 — 11500 (fiction) (non fiction)
2015 — 12760 (fiction) (non fiction)
During 2010 to 2015 let us assume that there is 10%
Increase in both category
Increase in both category
$11500 \rightarrow \text{fiction}\ (10\%)$
$\rightarrow \text{non} - \text{fiction}(10\%)$
So, total increase = 10% of 11500 = 1150
But actually, total increase = 1260
Difference of value in total difference is because we take 10% increase in both category.
Actually there is 10% increase in fiction & (10+2)% increase in non fiction
$\therefore$ 2 % = 110 [$\because 1260 - 1150 = 110$]
1% = 55
100% = 5500 (total no of non-fiction book in 2010)
So no of fiction book in 2010
= 11500 – 5500
= 6000
$\therefore$ no of fiction book in 2015
= 6000 + 600
= 6600

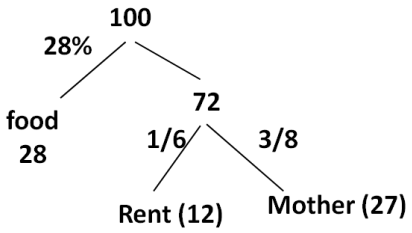
9. **(c)**

	R	:	(M + A)
inilially	1	:	12
	+6 ↓	1unit	+12 → 2unit
after review	2	:	14

	A	:	M	:	R
Revisedscore	11	:	10	:	3
	4 ×↓				↓× 4
	44 marks				12 marks

Res answer = marks scored by anjali – marks scored by rama's
= 44 – 12 = 32 marks

10. **(b)** Let total salary be 100

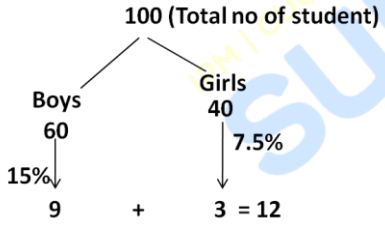


Amount left = 100 – 28 – 12 – 27 = 33
According to question 33 = 5280
1 = 160
Req amount (mother) 27 = 4320

11. **(a)** Sol.

Net change $= -20 + 40 + \frac{(-20)(40)}{100}$
$= 12\%$
$12\% = 8400$
$1\% = 700$
$100\% = 70000$ (total sale)
Price of ticket $= \frac{\text{Total sale}}{\text{no of tickets}}$
$= \frac{70000}{140} = 500$

12. **(d)**



12 ≡ 90
$1 \equiv \frac{30}{4}$
Now, $100 - 12 = 88$
$\downarrow \times \frac{1}{2}$
$= 44 \xrightarrow{(\times 30/4)} = 330$

13. **(a)** Net income = Gross income – income tax
There is no change in gross income
So, increase in income tax & the decrease in net income is equal to each other
19% of income tax = 6% of net income
$\frac{\text{income tax}}{\text{net income}} = \frac{6}{19}$
Rate of income tax = $\frac{6}{25} \times 100$
$= 24\%$

14. **(b)**

	Pulp	Water
Fresh fruit	32%	68%
Dry Fruit	80%	20%

80% of D.F. = 32% of fresh fruit
D.F. = $\frac{32}{80} \times 100$
= 40 kg

15. **(b)** 8.33% = $\frac{1}{12}$

I	II	III
11		12
	15 :	16
44 :	45 :	48

Average of 44 and 48 is 46
Reg. % change = $\frac{46-45}{45} \times 100$
$= \frac{1}{45} \times 100$
$= 2.22\%$

16. **(a)** Area = $\frac{1}{2} \times$ Base $\times$ height
$A_1 = 100 \times 11$
$A_2 = 132 \times 9$
$A_1 : A_2$
$100 \times 11 : 132 \times 9$
$100 : 108$
8 = 324
1= 40.5
108 = 108 ×40.5
= 4374 Area of new triangle

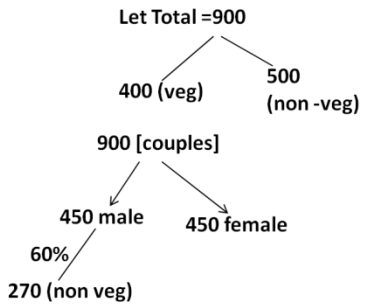
17. **(c)** Sol.

Volume $= \pi r^2 h$ $[\pi = \text{constant}]$
$v \propto r^2 h$
$\frac{v}{h} \propto r^2$

	Initial		final
v	100	:	143
h	13	:	11
r^2 :	100×11	:	13×143

$r^2 = 100 : 169$
$r : 10 : 13$
Curved surface Area = C· S · A = 2πrh
C·S·A ∝ r × h
C·S·A = r × h
$(C \cdot S \cdot A)_1 = 10 \times 13$
$(C \cdot S \cdot A)_2 = 13 \times 11$
$(C \cdot S \cdot A)_1 : (C \cdot S \cdot A)_2$
$10 \times 13 : 13 \times 11$
$10 : 11 = 1$
Res % change $= \frac{1}{10} \times 100 = 10\%$

18. **(a)** $44\frac{4}{9}\% = \frac{4 \to (\text{vegeterian})}{9 \to (\text{total})}$



No. of female (non-veg) = 500 – 270 = 230
But 230 unit = 920
1 unit = 4
No of fathers = 20% of males
= 20 % of 450
= 90 units
∴ Req answer = 90 × 4 = 360

19. **(c)**

	A	:	B
Income	400	:	700
Savings	106	:	64

$[\because 700 - 64 = 636$
$106 - 64 = 42]$

42 = 315
6 = 45
1 = 7.5
550 × 7.5 = 4125

20. **(a)**

W		R		P
5	:	7	:	8
9.5%		17.5%		12.5%
		↓		↓
		$(9.5 + 8)\%$		$(9.5 + 3)\%$

Total increase in expenditure
$= 9.5 + \frac{8\times7+3\times8}{20} = 540$
$= (9.5 + 4)\% = 540$
$= 13.5\% = 540$
$= 1\% = 40$
100% = 4000
Total expenditure = 4000
Total savings = 500
Total income = 4500