

## SECTION - E : QUANTITATIVE TECHNIQUES

**Directions (Q.109-Q.112):** Study the following information carefully and answer the given questions: Line graph given below shows the distance between Delhi to five different cities in kilo meter and Table given below shows the speed of five different cars in km/hr



NOTE: - Some data is missing you have to calculate according to question.

- 109. Time taken by car 'P' to travel from city 'E' to Delhi and then Delhi to city 'B', is equal to the time taken by car 'R' to travel from Delhi to city 'A' and then city 'A' to city 'B'. Find the distance between city 'A' and city 'B'?
  (a) 5650 km
  (b) 5750 km
  (c) 5450 km
  (d) 5550 km
- 110. Find the approximate time car T' takes to reach city 'E' from city 'A' if city 'A' and city 'E' is north and east direction of Delhi respectively?
  (a) 24 hours
  (b) 27 hours
  (c) 20 hours
  (d) 36 hours
- 111. Car Q and Car S start from Delhi for city B and city C respectively and they reached in equal time. If Car Q and Car S starts from city B and city D respectively at same time and move towards each other, then time taken by car Q to cross car S is what percent of the time taken by car Q to reach city B from Delhi. Distance between city B and city D is 1500 km?
  (a) 25%
  (b) 20%
  (c) 30%
  (d) 40%
- 112. A thief runs in a car S from Delhi to city E and after 6 hours of running, a policeman started to catch him in a car R. Due to this, thief increases the speed of his car by 100%. By this, the policeman is able to catch him at 3/5th of the distance of city E from Delhi. Find the initial speed of car 'S'?
  (a) 15 km/hr
  (b) 27 km/hr
  (c) 20 km/hr
  (d) 25 km/hr.



**Directions**(Q.113-Q.116): These questions are based on the following information.

In a box there are marbles in three colours - red, violet and blue. The probability of selecting one red marble is  $\frac{1}{4}$  and the probability of selecting one violet marble is 5/12. The number of blue marbles in the box is 8.

- 113. If all the marbles are numbered starting from 1, 2, 3, and so on then what is the probability of selecting one marble which is numbered as a multiple of 3 or 4 out of the total marbles?
  - (a) 2/5 (b) 1/6 (c) 3/8 (d) 1/2
- 114. What is the total number of marbles in the box?(a) 10(b) 15(c) 20(d) 24
- 115. When two marbles drawn from box then find the probability that both marbles are red.(a) 2/25(b) 1/93(c) 3/88(d) 5/92
- 116. What is the probability of selecting one blue marble is (a) 2/5 (b) 1/3 (c) 3/8

**Directions**(Q.117-Q.120): These questions are based on the following information.

A company XYZ Ltd has three units - P, Q and H. In each of these units there are five departments—Production, Marketing, Finance, HR and Accounts. The total number of employees in P, Q and H are in the ratio 3:5:4. The total number of employees in Production, Marketing, Finance, HR and Accounts in all the three units together are in the ratio 5 : 3: 1: 1: 2. The ratio of the number of male employees of XYZ Ltd to that of the female employees of XYZ Ltd is 2 : 1. In each of the three units, there is no female employee in the Production department and no male employee in the HR department. In each of Marketing, Finance and Accounts departments at each of the units, males and females are equal in number. Also the total number of employees in Marketing, Finance and Accounts departments are equally distributed among each of the units. The company has 36,000 employees in total and the number of male employees in the production department at P, Q and H are in the ratio 2: 8: 5.

- 117. What is the total number of male employees in units P and H together?
  (a) 7500
  (b) 10000
  (c) 9000
  (d) None of these
- 118. The number of female employees in the HR and the Marketing departments together is what percentage of the total number of employees in Q?
  (a) 25%
  (b) 50%
  (c) 331/3%
  (d) 20%
- 119. In which unit is the number of female employees as a percentage of the total number of employees, the highest?(a) P(b) Q(c) R(d) All of the above
- 120. In how many departments of XYZ Ltd is the number of employees, as a percentage of the number of employees in P, more than 80%?

(a) 2 (b) 3 (c) 1 (d) 4



electoral challenges in the upcoming state elections.'

- 105. (d) The author assumes that the entry of private sector would bring more money into the development of metro rail, and hence, the development of metro infrastructure would surpass that of public buses that are already reeling under the losses. Option D is the assumption inherent in the argument. Option A appears a deliberate plan on part of the government to dismantler the public bus transport, which is not supported in the way of arguments; hence cannot be the assumption. Option B and C are inferences that can be drawn from the statement. Going by selection by negation, option D is the assumption that can invalidate the main argument completely.
- 106. (d) The author argues that the budget does not talk about the smart city initiative because the government is embarrassed as it signifies policy and implementation failure on its part. All the options counter the same by arguing that the financial aspect of the smart cities' initiative has already been taken care of, and it is a long-term initiative; hence, every annual budget need not talk about the smart city initiative. Hence, Option D is the right answer
- 107. (d) The author states that PPP partnership is just a way of allowing entry of the private sector in the metro rail, hence, option A. is untrue. Option B. is not true because the author states that migrant workers have not been given any benefits but only a tax concession for housing. Option C. is incorrect as labour welfare measures do not aim at reviving reduced employment. Option D corresponds with the contentions of the author; therefore, it is true as per the passage, making it the answer. Refer to the lines, 'The best examples are of migrant housing. Instead of government providing immediate thrust on housing and labour hostels, they will be given tax concessions, and there are no separate allocations that ensure the delivery of housing options to migrant workers whose suffering during the pandemic will remain in our collective memory.'
- 108. (c) The author is saying that the budget was not urban development friendly. It contained only half-hearted measures which seemed as if benefits are being given without any actual benefit accruing to the urban population. This is the basic gist of the passage. Hence, C is the right answer. Option A is vague as it does not mention any of the points. Option B is contrary to what finds a mention in the passage. Refer to the lines, 'An urban employment guarantee scheme was the most urgent requirement. In fact, since the 2009 election campaign, the BJP had promised such an employment guarantee scheme.' The author suggests that urban employment guarantee scheme does not get any substantial promises, despite it being an urgent requirement. Option D is extreme. The author does arrive at an abject and hopelessness of the budget.

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- 109. (b) Distance travel by car P  $= 1500 + 3000 = 4500 \,\mathrm{km}$ Total Time taken =  $\frac{4500}{40}$  = 112.5 hour Time taken by car R from Delhi to City A =  $\frac{1000}{60}$  =  $\frac{50}{3}$  hours Time taken from city A to city B =  $112.5 - \frac{50}{2}$  $=\frac{287.5}{3}$ Distance from between City A to city B  $=\frac{287.5}{3} \times 60 = 5750$  km 110. **(a)** City A 1000 Delhi 1500 City E Distance between city A and city E  $=\sqrt{1000^2 + 1500^2} = \sqrt{1000000 + 2250000}$  $\neq \sqrt{3250000} = 500\sqrt{13}km$ Approximate time taken by car 'T'  $=\frac{500\sqrt{13}}{75}\approx 24$  hours Let speeds of car Q and car S be x and y respectively. ATO- $\Rightarrow \frac{3000}{2000} = \frac{2000}{2000}$ x y  $\Rightarrow \frac{x}{y} = \frac{3}{2}$ Let speed of car Q and car S be 3a and 2a respectively Distance between city B and city D = 1500 kmTime taken to cross each other  $=\frac{1500}{5a}=\frac{3\dot{0}0}{a}$ Time taken by car Q to reach city B from Delhi =  $\frac{3000}{3a} = \frac{1000}{a}$ Required% =  $\frac{300 \times 100}{1000} = 30\%$ 112. **(d)**  $\frac{1500 \times 3}{5} = 900 \text{ km}$ Time taken by car R to cover this distance  $=\frac{900}{60}=15$  hour Let initial speed of car S = x km/hrSo. ATO 6x + 15(2x) = 9006x + 30x = 90036x = 900 $x = 25 \, km/hr$ (d) Let the number of red marbles and violet marbles be 113. r and v respectively.  $\frac{r}{r+v+8} = \frac{1}{4} \text{ and } \frac{v}{r+v+8} = \frac{5}{12};$ By solving we get, r= 6 and v = 10
  - The total number of marbles which is numbered as a multiple of 3 = 3, 6, 9, 12, 15, 18, 21, 24Total number of marbles which is numbered as a

multiple of 4 = 4, 8, 12, 16, 20, 24



The number of repetitions =  $2 \{12, 24\}$ The required probability =  $\frac{8}{24} + \frac{6}{24} - \frac{2}{24}$  $=\frac{12}{24}=\frac{1}{2}$ 

- 114. (d) The number of red-coloured marbles = 6. The number of violet coloured marbles = 10. Total number of marbles = 24.
- 115. (d) Total number of marbles = 24.

## Hint[117-120]:

The given information can be tabulated as below.

The number of red-coloured marbles = 6Required Probability =  $\frac{6C_2}{24C_2} = \frac{6\times 5}{24\times 23} = \frac{5}{92}$ 116. (b) The number of blue - coloured marbles = 8. Total number of marbles = 24.  $\therefore$  Required Probability = 8/24 = 1/3

	Р		Q		R		Total
	Male	Females	Male	Females	Male	Females	
Production	2000	-	8000	-	5000	-	15000
Marketing	1500	1500	1500	1500	1500	1500	9000
Finance	500	500	500	500	500	500	3000
HR	-	1000	-	1000	-	1000	3000
Accounts	1000	1000	1000	1000	1000	1000	6000
Total	5000	4000	11000	4000	8000	4000	36000

(d) The required number of employees 5000 + 8000 = 13000. 117.

- (b) The required percentage =  $\frac{2500+2500+2500}{15000} \times 100 = 50\%$ 118. 15000
- (a) The percentage of females for P, Q and R are  $\frac{4000}{9000}$  (100)%,  $\frac{4000}{15000}$  (100)% and  $\frac{4000}{12000}$  (100)% respectively. July in the sources of the sources o 119. Highest of these is the first percentage i.e. for P.
- 120. (a) 80% of the total number of employees of P is 7200. Only in the production and marketing departments is the number of employees more than 7200.