Value Based Questions

Que 1. The amount donated by some households in their religious organisation are as follow.

Amount (in ₹)	Number of households
Less than 100	14
Less than 200	22
Less than 300	37
Less than 400	58
Less than 500	67
Less than 600	75

Calculate the arithmetic mean for the above data.
What values do these households possess?

Sol.

Amount (in ₹)	cf	f_i	x_i	$ui = \frac{xi - 250}{100}$	$f_i u_i$
0 – 100	14	14	50	– 2	– 28
100 – 200	22	8	150	– 1	– 8
200 – 300	37	15	**250**	0	0
300 – 400	58	21	350	1	21
400 – 500	67	9	450	2	18
500 – 600	75	8	550	3	24
Total		$\Sigma f_i = 75$			27

By step deviation method

Arithmetic mean = $A + \frac{\Sigma f_i u_i}{\Sigma f_i} \times h = 250 + \frac{27}{75} \times 100 = 286$

Religion values, Helpfulness.

Que 2. Some people of a society decorated their area with flags and tricolour ribbons on Republic Days. The following data shows the number of person in different age group who participated in the decoration:

Age in years	5 – 15	15 – 25	25 – 35	35 – 45	45 – 55	55 – 65
Number of patients	6	11	21	23	14	5

Find the mode of the above data. What values do there persons possess?

Sol. $h = 10,\ f_1 = 23,\ f_0 = 21,\ f_2 = 14,\ l = 35$

Mode = $l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h$

Mode = $35 + \frac{23-21}{46-35} \times 10 = 35 + \frac{20}{11} = 35 + 1.8 = 36.8$

National integrity, Unity, Beauty.

Que 3. The table below gives the distribution of villages under different height from sea level in a certain region.

Height in metres	200	600	1000	1400	1800	2200
No. of villages	142	265	560	271	89	16

(i) Compute the mean height of the region.
(ii) Which mathematical concept is used in this problem?
(iii) What is the value of village in modern times?

Sol. (i) Let the assumed mean A = 1400 and h = 400

Height $(x_i \ in \ metres)$	**No. of villages** f_i	$u_i = \frac{x_i - 1400}{400}$	$f_i u_i$
200	142	− 3	− 426
600	265	− 2	− 530
1000	560	− 1	− 560
1400	271	0	0
1800	89	1	89
2200	16	2	32
Total	$N = \Sigma f_i = 1343$		$\Sigma f_i u_i = -1395$

Mean = $A + \frac{\Sigma f_i u_i}{\Sigma f_i} \times h$

$= 1400 + 400 \times \frac{-1395}{1343} = 1400 - 415.49 = 984.51$

(ii) Mean by step deviation method.
(iii) Villages are important to keep a balance between the ecological problems.

Que 4. (i) Find the mean of children per family from data given below:

No. of children	0	1	2	3	4	5
No. of families	5	11	25	12	5	2

(ii) Which mathematical concept is used in this problem?
(iii) Which value is discussed here?

Sol. (i)

No. of children x_i	**No. of families f_i**	$f_i x_i$
0	5	0
1	11	11
2	25	50
3	12	36
4	5	20
5	2	10
Total	$\Sigma f_i = 60$	$\Sigma f_i x_i = 127$

Mean = $\frac{\Sigma f_i x_i}{\Sigma f_i} = \frac{127}{60} = 2.12\ (approx.)$

(ii) Mean of ungrouped data.
(iii) For progress, we should reduce the population growth.

Que 5. In a survey it was found that 40% people use petrol, 35% use diesel and remaining use CNG for their vehicles. Find the probability that a person chosen at random uses CNG.
Which fuel out of the above three is appropriate for the welfare of the society?

Sol. Percentage of people using CNG = 100 – (40 + 35) = 25%

P (Person using CNG) = $\frac{25}{100} = \frac{1}{4}$

CNG is useful as it does not leave unburnt carbon particles and also does not release other harmful gases which causes pollution in air.

Que 6. In a survey it was found that 30% of the population is using non-biodegradable products while the remaining is using biodegradable products. What is the probability that a person chosen at random uses non-biodegradable products? Which type of products should be used in a society for its proper development – biodegradable or non-biodegradable? Justify your answer.

Sol. P (Person using non-biodegradable products) = (100 – 30) %

$= \frac{70}{100} = \frac{7}{10}$

Biodegradable products are reusable and cause less pollution, so such products should be used.

Que 7. A school gives awards to the students of each class-5 for bravery, 3 for punctuality, 3 for full attendance, 4 for social service and 5 for self-confidence. An awarded student is selected at random. What is the probability that he/she is being awarded for (i) punctuality (i) self-confidence.
Which value out of the above five is most important for the development of society? Justify your answer.

Sol. Total awards given to each class = 5 + 3 + 3 + 4 + 5 = 20

(i) P (punctual students) = $\frac{3}{20}$

(ii) P (Self-confident students) = $\frac{5}{20} = \frac{1}{4}$

Any value with justification is correct. (Do yourself)

Que 8. Arushi, Mahi and Saina were fighting to get first chance in a game. Arushi says, "Let us toss two coins. If both heads appear, Mahi will take first chance, if both tails appear, Saina will get it and if one head and one tail appears, I will get the chance."
(i) What is the probability of Arushi getting the first chance?
(ii) Is her decision fair?
(iii) What quality of her character is being depicted here?

Sol. The sample space of the experiment of tossing two coins in {HT, TH, HH, TT}. Outcomes favourable to Arushi are HT and HT.

(i) P (Arushi getting first chance) = $\frac{2}{4} = \frac{1}{2}$

(ii) No, the number of cases favourable to each one of them is not equal.
(iii) Dishonesty, as she kept two cases favourable to her and one each for the other two friends.