

Directorate of Education

Govt. of NCT of Delhi

Additional Support Material on Value Based Questions for the Session 2012-2013

Subject: Mathematics

Class: XII

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Addl.DE (School/Exam)

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VALUE BASED PROBLEMS

MATHEMATICS

CLASS-XII

RELATIONS AND FUNCTIONS

- Q.1 Prove that $f: \mathbb{R} \rightarrow \mathbb{R}$ is a bijection given by $f(x) = x^2 + 3$. Find $f^{-1}(x)$. Does the truthfulness and honesty may have any relation?
- Q.2 Set $A = \{a_1, a_2, a_3, a_4, a_5\}$ and $B = \{b_1, b_2, b_3, b_4\}$ when a_i 's and b_i 's are school going students. Define a relation from a set A to set B by $x R y$ iff y is a true friend of x .
If $R = \{(a_1, b_1), (a_2, b_1), (a_3, b_2), (a_4, b_2), (a_5, b_2)\}$
Is R a bijective function? Do you think true friendship important in life? How?
- Q.3 If h denotes the number of honest people and p denotes the number of punctual people and a relation between honest people and punctual people is given as $h = p + 5$. If P denotes the number of people who progress in life and a relation between number of people who progress and honest people is given as $P = (h/8) + 5$. Find the relation between number of people who progress in life and punctual people. How does the punctuality important in the progress of life?
- Q.4 Let A be the set of all students of class XII in a school and R be the relation, having the same sex on A, and then prove that R is an equivalence relation. Do you think, co-education may be helpful in child development and why?

MATRICES & DETERMINANTS

- Q.5 Three shopkeepers A, B, C are using polythene, handmade bags (prepared by prisoners), and newspaper's envelope as carry bags. It is found that the shopkeepers A, B, C are using (20,30,40), (30,40,20), (40,20,30) polythene, handmade bags and newspapers envelopes respectively. The shopkeepers A, B, C spent Rs.250, Rs.220 & Rs.200 on these carry bags respectively. Find the cost of each carry bags using matrices. Keeping in mind the social & environmental conditions, which shopkeeper is better? & why?
- Q.6 In a Legislative assembly election, a political party hired a public relation firm to promote its candidate in three ways; telephone, house calls and letters. The numbers of contacts of each type in three cities A, B & C are (500, 1000, and 5000), (3000, 1000, 10000) and (2000, 1500, 4000), respectively. The party paid Rs. 3700, Rs.7200, and Rs.4300 in cities A, B & C respectively. Find the costs per contact using matrix method. Keeping in mind the economic condition of the country, which way of promotion is better in your view?

- Q.7 A trust fund has Rs. 30,000 is to be invested in two different types of bonds. The first bond pays 5% interest per annum which will be given to orphanage and second bond pays 7% interest per annum which will be given to an N.G.O. cancer aid society. Using matrix multiplication, determine how to divide Rs 30,000 among two types of Bonds if the trust fund obtains an annual total interest of Rs. 1800. What are the values reflected in the question.
- Q.8 Using matrix method solve the following system of equations
 $x + 2y + z = 7$
 $x - y + z = 4$
 $x + 3y + 2z = 10$
 If X represents the no. of persons who take food at home. Y represents the no. of persons who take junk food in market and z represent the no. of persons who take food at hotel. Which way of taking food you prefer and why?
- Q.9 A school has to reward the students participating in co-curricular activities (Category I) and with 100% attendance (Category II) brave students (Category III) in a function. The sum of the numbers of all the three category students is 6. If we multiply the number of category III by 2 and added to the number of category I to the result, we get 7. By adding second and third category would to three times the first category we get 12. Form the matrix equation and solve it.
- Q.10 for keeping Fit X people believes in morning walk, Y people believe in yoga and Z people join Gym. Total no of people are 70. further 20% 30% and 40% people are suffering from any disease who believe in morning walk, yoga and GYM respectively. Total no. of such people is 21. If morning walk cost Rs 0 Yoga cost Rs 500/month and GYM cost Rs 400/ month and total expenditure is Rs 23000.
 (i) Formulate a matrix problem.
 (ii) Calculate the no. of each type of people.
 (iii) Why exercise is important for health?
- Q.11 An amount of Rs 600 crores is spent by the government in three schemes. Scheme A is for saving girl child from the cruel parents who don't want girl child and get the abortion before her birth. Scheme B is for saving of newlywed girls from death due to dowry. Scheme C is planning for good health for senior citizen. Now twice the amount spent on Scheme C together with amount spent on Scheme A is Rs 700 crores. And three times the amount spent on Scheme A together with amount spent on Scheme B and Scheme C is Rs 1200 crores. Find the amount spent on each Scheme using matrices? What is the importance of saving girl child from the cruel parents who don't want girl child and get the abortion before her birth?
- Q.12 There are three families. First family consists of 2 male members, 4 female members and 3 children. Second family consists of 3 male members, 3 female members and 2 children. Third family consists of 2 male members, 2 female members and 5 children. Male member earns Rs 500 per day and spends Rs 300 per day. Female member earns Rs 400 per day and spends Rs 250 per day child member spends Rs 40 per day. Find the money each family saves per day using matrices? What is the necessity of saving in the family?

CONTINUITY AND DIFFERENTIABILITY

Q.13 A car driver is driving a car on the dangerous path given by

$$f(x) = \begin{cases} 1-x^m, & x \neq 1 \\ \frac{1-x}{m-1}, & x = 1 \end{cases} \quad m \in \mathbb{N}$$

Find the dangerous point (point of discontinuity) on the path. Whether the driver should pass that point or not? Justify your answers.

APPLICATION OF DERIVATIVES

Q.14 A car parking company has 500 subscribers and collects fixed charges of Rs.300 per subscriber per month. The company proposes to increase the monthly subscription and it is believed that for every increase of Re.1, one subscriber will discontinue the service. What increase will bring maximum income of the company? What values are driven by this problem?

Q.15 Check whether the function $f(x) = x^{100} + \sin x - 1$ is strictly increasing or strictly decreasing or none of both on $(-1,1)$. Should the nature of a man be like this function? Justify your answers.

Q.16 If $y = x^4 - \frac{x^3}{3}$, when x denotes the number of hours worked and y denotes the amount (in Rupees) earned. Then find the value of x (in interval) for which the income remains increasing? Explain the importance of earning in life?

Q.17 If performance of the students 'y' depends on the number of hours 'x' of hard work done per day is given by the relation.

$$y = 4x - \frac{x^2}{2}$$

Find the number of hours, the students work to have the best performance.

'Hours of hard work are necessary for success' Justify.

Q.18 A farmer wants to construct a circular well and a square garden in his field. He wants to keep sum of their perimeters fixed. Then prove that the sum of their areas is least when the side of square garden is double the radius of the circular well.

Do you think good planning can save energy, time and money?

Q.19 Profit function of a company is given as $P(x) = \frac{24x}{5} - \frac{x^2}{100} - 500$ where x is the number of units produced. What is the maximum profit of the company? Company feels its social responsibility and decided to contribute 10% of his profit for the orphanage. What is the amount contributed by the company for the charity? Justify that every company should do it.

Q.20 In a competition a brave child tries to inflate a huge spherical balloon bearing slogans against child labour at the rate of 900 cubic centimeters of gas per second. Find the rate at which the

radius of the balloon is increasing when its radius is 15cm. Also write any three values/life skill reflected in this question.

- Q.21 In a kite festival, a kite is at a height of 120m and 130m string is out. If the kite is moving horizontally at the rate of 5.2m/sec, find the rate at which the string is being pulled out at that instant. How a festival enhance national integration.
- Q.22 An expensive square piece of golden color board of side 24 centimeters. is to be made into a box without top by cutting a square from each corner and folding the flaps to form a box. What should be the side of the square piece to be cut from each corner of the board to hold maximum volume and minimize the wastage? What is the importance of minimizing the wastage in utilizing the resources?
- Q.23 A student is given card board of area 27 square centimeters. He wishes to form a box with square base to have maximum capacity and no wastage of the board. What are the dimensions of the box so formed? Do you agree that students don't utilize the resources properly? Justify.

INTEGRATION

- Q.24 Evaluate, $\int \frac{x^3 - x + 1}{x^2 + 1} dx$, Discuss the importance of integration (unity) in life.

APPLICATIONS OF INTEGRALS

- Q.25 A farmer has a piece of land. He wishes to divide equally in his two sons to maintain peace and harmony in the family. If his land is denoted by area bounded by curve $y^2 = 4x$ and $x = 4$ and to divide the area equally he draws a line $x = a$. what is the value of a?
What is the importance of equality among the people?
- Q.26 A circular Olympic gold medal has a radius 2cm and taking the centre at the origin, Find its area by method of integration. What is the importance of Olympic Games for a sportsman and why?
Olympic game is a supreme platform for a sportsman. In Olympic Games all countries of the world participate and try their best and make their country proud.
- Q.27 A poor deceased farmer has agriculture land bounded by the curve $y = \cos x$, between $x = 0$ and $x = 2\pi$. He has two sons. Now they want to distribute this land in three parts (As already partitioned). Find the area of each part. Which parts should be given to the farmer & why? Justify your answer.
- Q.28 If a triangular field is bounded by the lines $x + 2y = 2$, $y - x = 1$ and $2x + y = 7$ Using integration compute the area of the field
(i) If in each square unit area 4 trees may be planted. Find the number of trees can be planted In the field.

(ii) Why plantation of trees is necessary?

DIFFERENTIAL EQUATIONS

Q.29 Solve the differential equation $(x + 2y^2) \frac{dy}{dx} = y$

Given that when $x=2$, $y=1$. If x denotes the % of people who are Polite and y denotes the % of people who are intelligent. Find x when $y = 2\%$.

A polite child is always liked by all in society. Do you agree? Justify.

Q.30 $\frac{dy}{dx} + \frac{y}{x} = 0$, where x denotes the percentage population living in a city & y denotes the area for living a healthy life of population. Find the particular Solution when $x = 100$, $y = 1$.

Is higher density of population is harmful? Justify your answer.

VECTORS & 3-DIMENSIONAL GEOMETRY

Q.31 considering the earth as a plane having equation $5x + 9y - 10z + 138 = 0$, A monument is standing vertically such that its peak is at the point $(1, 2, -3)$. Find the height of the monument.

How can we save our monument?

Q.32 Let the point $p(5, 9, 3)$ lies on the top of Qutub Minar, Delhi. Find the image of the point on the line

$$\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$$

Do you think that the conservation of monuments is important and why?

Q.33 Two bikers are running at the Speed more than allowed speed on the road along the Lines

$$\vec{r} = \hat{i} + \hat{j} - \hat{k} + \lambda(3\hat{i} - \hat{j}) \text{ and}$$

$$\vec{r} = 4\hat{i} - \hat{k} + \mu(2\hat{i} + 3\hat{k})$$

Using Shortest distance formula check whether they meet to an accident or not? While driving should driver maintain the speed limit as allowed. Justify?

LINEAR PROGRAMMING PROBLEMS

Q.34 A dietician wishes to mix two types of food in such a way that the vitamin content of the mixture contain at least 8 unit of vitamin A and 10 unit of vitamin C. Food I contains 2unit/kg

of vitamin A and 1unit/kg of vitamin C, while food II contains I unit/kg of vitamin A and 2unit/kg of vitamin C. It cost Rs.5.00 per kg to purchase food I and Rs.7.00 per kg to produce food II. Determine the minimum cost of the mixture. Formulate the LPP and solve it.
Why a person should take balanced food?

- Q.35 A farmer has a supply of chemical fertilizers of type 'A' which contains 10% nitrogen and 6% phosphoric acid and type 'B' contains 5% of nitrogen and 10% of phosphoric acid. After soil testing it is found that at least 7kg of nitrogen and same quantity of phosphoric acid is required for a good crop. The fertilizers of type A and type B cost Rs.5 and Rs.8 per kilograms respectively. Using L .P.P, find how many kgs of each type of fertilizers should be bought to meet the requirement and cost be minimum solve the problem graphically. What are the side effects of using excessive fertilizers?
- Q.36 If a class XII student aged 17 years, rides his motor cycle at 40km/hr, the petrol cost is Rs. 2 per km. If he rides at a speed of 70km/hr, the petrol cost increases Rs.7per km. He has Rs.100 to spend on petrol and wishes to cover the maximum distance within one hour.
1. Express this as an L .P.P and solve graphically.
 2. What is benefit of driving at an economical speed?
 3. Should a child below 18years be allowed to drive a motorcycle? Give reasons.
- Q.37 Vikas has been given two lists of problems from his mathematics teacher with the instructions to submit not more than 100 of them correctly solved for marks. The problems in the first list are worth 10 marks each and those in the second list are worth 5 marks each. Vikas knows from past experience that he requires on an average of 4 minutes to solve a problem of 10 marks and 2 minutes to solve a problem of 5 marks. He has other subjects to worry about; he cannot devote more than 4 hours to his mathematics assignment. With reference to manage his time in best possible way how many problems from each list shall he do to maximize his marks? What is the importance of time management for students?
- Q.38 An NGO is helping the poor people of earthquake hit village by providing medicines. In order to do this they set up a plant to prepare two medicines A and B. There is sufficient raw material available to make 20000 bottles of medicine A and 40000 bottles of medicine B but there are 45000 bottles into which either of the medicine can be put. Further it takes 3 hours to prepare enough material to fill 1000 bottles of medicine A and takes 1 hour to prepare enough material to fill 1000 bottles of medicine B and there are 66 hours available for the operation. If the bottle of medicine A is used for 8 patients and bottle of medicine B is used for 7 patients. How the NGO should plan his production to cover maximum patients? How can you help others in case of natural disaster?

PROBABILITY

- Q.39 Probability of winning when batting coach A and bowling coach B working independently are $\frac{1}{2}$ and $\frac{1}{3}$ respectively. If both try for the win independently find the probability that there is a win. Will the independently working may be effective? And why?
- Q.40 A person has undertaken a construction job. The probabilities are 0.65 that there will be strike, 0.80 that the construction job will be completed on time if there is no strike and 0.32 that the construction job will be completed on time if there is strike. Determine the probability that the construction job will be completed on time. What values are driven by this question?
- Q.41 A clever student used a biased coin so that the head is 3 times as likely to occur as tail. If the coin tossed twice find the probability distribution and mean of numbers of tails. Is this a good tendency? Justify your answer.
- Q.42 A man is known to speak truth 5 out of 6 times. He draws a ball from the bag containing 4 white and 6 black balls and reports that it is white. Find the probability that it is actually white?
Do you think that speaking truth is always good?
- Q.43 A drunkard man takes a step forward with probability 0.6 and takes a step backward with probability 0.4. He takes 9 steps in all. Find the probability that he is just one step away from the initial point. Do you think drinking habit can ruin one's family life?
- Q.44 If group A contains the students who try to solve the problem by knowledge, Group B contains the students who guess to solve the problem Group C contains the students who give answer by cheating. If $n(A) = 20$, $n(B) = 15$, $n(C) = 10$, 2 Students are selected at random. Find the probability that they are from group c. Do you think that cheating habit spoils the career?
- Q.45 In a school, 30% of the student has 100% attendance. Previous year result report tells that 70% of all students having 100% attendance attain A grade and 10% of remaining students attain A grade in their annual examination. At the end of the year, One student is chosen at random and he has an A grade. What is the probability that the student has 100% attendance? Also state the factors which affect the result of a student in the examination.
- Q.46 A man is known to speak truth 3 out of 4 times. He throws a die and reports that it is six. Find the probability that it is actually a six. Write any three benefits of speaking the truth.
- Q.47 There are 20 People in a group. Out of them 7 people are non-vegetarian, 2 people are selected randomly. Write the probability distribution of non-vegetarian people. Explain whether you would like to be vegetarian or non-vegetarian and why? Also keeping life of animals in mind how would you promote a person to be vegetarian?
- Q.48 Two third of the students in a class are sincere about their study and rest are careless Probability of passing in examination are 0.7 and 0.2 for sincere and careless students

respectively, A Student is chosen and is found to be passed what is the probability that he/she was sincere. Explain the importance of sincerity for a student.

- Q.49 A company has two plants of scooter manufacturing. Plant I manufacture 70% Scooter and plant II manufactures 30%. At plant I 80% of the scooter's are maintaining pollution norms and in plant II 90% of the scooter maintaining Pollution norms. A Scooter is chosen at random and is found to be fit on pollution norms. What is the probability that it has come from plant II. What is importance of pollution norms for a vehicle?
- Q.50 A chairman is biased so that he selects his relatives for a job 3 times as likely as others. If there are 3 posts for a job. Find the probability distribution for selection of persons other than their relatives.
If the chairman is biased than which value of life will be demolished?
- Q.51 A manufacturer has three machine operators A (skilled) B (Semi- skilled) and C (non-skilled).The first operator A Produces 1% defective items where as the other two operators B and C produces 5% and 7 % defective items respectively. A is on the job for 50% of time B in the job for 30% of the time and C is on the job for 20 % of the time. A defective item is produced what is the probability that it was produced by B? What is the value of skill?
- Q.52 In a group of 100 families, 30 families like male child, 25 families like female child and 45 families feel both children are equal. If two families are selected at random out of 100 families, find the probability distribution of the number of families feel both children are equal. What is the importance in the society to develop the feeling that both children are equal?
- Q.53 In a group of 200 people, 50% believe in that anger and violence will ruin the country, 30% do not believe in that anger and violence will ruin the country and 20% are not sure about anything. If 3 people are selected at random find the probability that 2 people believe and 1 does not believe that anger and violence will ruin the country. How do you consider that anger and violence will ruin the country?
- Q.54 In a group of students, 200 attend coaching classes, 400 students attend school regularly and 600 students study themselves with help of peers. The probability that a student will succeed in life who attend coaching classes, attend school regularly and study themselves with help of peers are 0.1, 0.2 and 0.5 respectively. One student is selected who succeeded in life, what is the probability that he study himself with help of peers. What type of study can be considered for the success in life and why?

RELATIONS AND FUNCTION

Ans.1 $f^{-1}(x) = (x - 3)^{\frac{1}{3}}$,

Truthfulness and honesty among people may have the bijective (one-one onto) relation as people who are honest usually truthful and vice versa.

Ans.2 Neither one-one nor onto hence not bijective
Yes, true friendship makes life easier.

Ans.3 $P = \frac{P+45}{8}$,

Punctuality develops discipline in life and hence progressive in life.

Ans.4 The relation R is reflexive, symmetric and transitive .Co-education is very helpful because it leads to the balanced development of the children and in future they become good citizens.

MATRICES & DETERMINANTS

Ans.5 [Polythene=Re.1]

[Handmade bag = Rs.5]

[Newspaper's envelop=Rs.2]

Shopkeeper A is better for environmental conditions. As he is using least no of polythene.

Shopkeeper B is better for social conditions as he is using handmade bags (Prepared by prisoners).

Ans.6 Cost per Contact:

Telephone = Rs0.40

House calls = Re1.00

Letters = Rs0.50

Telephone is better as it is cheap.

Ans.7 Rs.15000 each type of bond.

(i) Charity.

(ii) Helping orphans or poor people.

(iii) Awareness about diseases.

Ans.8 $X = 3, Y = 1, Z = 2$

Food taken at home is always the best way.

Ans.9 $x+y+z=6, x+2z=7, 3x+y+z=12$ where x,y,z represent the number of students in categories I,II,III respectively.

$X=3, y=1, z=2$

Participating in co-curricular activities is very important. It is very essential for all round development.

Ans.10 (i) $x+y+z=70$, $2x+3y+4z=210$, $5y+4z=230$

(ii) $x=20$, $y=30$, $z=20$

(iii) Exercise keeps fit and healthy to a person.

Ans.11 Rs300crores, Rs200crores and Rs100 crores

(i) Our In country, male population is more than female population.

(ii) It is essential for a human being to save the life of all.

Ans.12 Rs880, Rs970, Rs 500. Saving is necessary for each family as in case of emergency our saving in good time helps us to survive in bad time.

CONTINUITY AND DIFFERENTIABILITY

Ans.13 [Point of Discontinuity $x = 1$]

No, because

Life is precious. Or

Drive carefully.

APPLICATION OF DERIVATIVES

Ans.14 Increase of Rs.100 monthly subscription for Max. Income of the company.

1. The sharing (2-3 persons on the same route) will be promoted.

2. Decrease pollution

3. Decrease vehicle density on road.

4. Saving of energy.

Ans.15 [Neither strictly increasing nor strictly decreasing].

Yes, because strictness in not always good in life.

Ans.16 $x \in \left(\frac{1}{4}, \infty\right)$

To support the family, regular increasing income is must.

Ans.17 4 hours per day. By hard work, we can create skill in using the things Learnt by us. So we

Don't make mistake in the competition when the things are asked.

Ans.18 Yes, every work done in a planned way proves to be more fruitful.

If a student makes a planning for his studies he can do wonders.

Ans.19 Maximum profit = Rs76 when $x=240$.

Yes it is good for society

Ans.20 $15/2\pi$ Cm. /Sec.

(i) Bravery

- (ii) Awareness about child labour
- (iii) Right of a child

Ans.21 4.8m/sec.

In a festival many people participated with full happiness and share their lives and enjoy it.

Ans.22 4 centimeters. As our country is still developing and most of the Indian people are from the middle class, so we should utilize our resources in proper way. Students should buy only those books which they feel really important. Instead of buying books for only one or two chapters. They should borrow it from the library.

Ans.23 length of square base is 3 centimeters and height of the box is 1.5 centimeters. Yes, I agree that students don't utilize the resources properly. They get various notes photocopies and waste one side of the paper. Whereas other side of paper can be utilized for making comments on those notes.

INTEGRATION

Ans.24 $\frac{x^2}{2} - \log|x^2 + 1| + \tan^{-1} x + C$

1. United we stand, divided we fall.
2. Union is strength.

APPLICATIONS OF INTEGRALS

Ans.25 $a = (16)^{1/3}$. Equality helps to maintain peace and harmony in all aspect of society

Ans.26 $4\pi cm^2$

Ans.27 1, 2, 1

1. Respect the parents
2. Help the elders (parents)

Ans.28 Area of the field= 6 Sq. unit

- (i) 24 trees
- (ii) Plants provide us oxygen and play major role in rain, so plantation is essential for all human beings.

DIFFERENTIAL EQUATIONS

Ans.29 $x = 2y^2$, 8. Yes polite child has a peaceful mind and peaceful mind grasps the ideas easily and understand the complicated concept

Ans.30 $[xy = 100]$

Yes, as the population increases area for living decreases, that is very harmful for us.

VECTORS & 3-DIMENSIONAL GEOMETRY

Ans.31 (i) $\frac{191}{\sqrt{206}}$ Units

(ii) We should not harm any monument.

(iii) We should not write anything on it.

(iv) We should respect our national heritage.

Ans.32 The point of image is (3, 5, 7)

Conservation of monuments is very important because it is a part of our history and their contribution.

Ans.33 S.D =0, this means they meet to an accident.

If a driver follow speed limit there will be minimum chance of accident.

LINEAR PROGRAMMING PROBLEMS

Ans.34 Minimum cost = Rs. 38.00

$x=2, y=4$

Balanced diet keeps fit, healthy and disease free life to a person.

Ans.35 Type A fertilizers = 50 kg, Type B = 40 kg. Minimum cost =Rs. 570/-
infertility of land.

Excessive use of fertilizers can spoil the quality of crop also it may cause.

Ans.36 1. Max. $Z= x + y,$

$$\frac{x}{40} + \frac{y}{70} \leq 1,$$

$$2x+7y \leq 100,$$

$$x \geq 0, y \geq 0$$

Where x & y represents the distance travelled by the speed of 40km/hr & 70 km/h respectively.

1. $x=1560/41\text{Km.}, y= 140/41\text{Km.}$

2. It Saves petrol. It saves money.

3. No because according to the law driving license is issued when a person is above the 18 years of age.

Ans.37 20 problems from first list and 80 problems from second list. Students who divide the time for each subject per day according to their need don't feel burden of any subject before the examination.

Ans.38 10500 bottles of medicine A and 34500 bottles of medicine B and they can cover 325500 patients. We should not get panic and should not create panic in case of natural disaster. Must have the helpline numbers of government agencies and NGO working in case of Natural Disaster.

PROBABILITY

Ans.39 $\left[\frac{2}{3}\right]$

1. Chances of success increase when ideas flow independently.
2. Hard work pays the fruits.

Ans.40 [0.488]

Peace is better than strike. As the probability of completion of job on time if there is strike is less than $\frac{1}{2}$.

Ans.41

x	0	1	2
P(x)	$\frac{9}{16}$	$\frac{6}{16}$	$\frac{1}{16}$

$$\text{Mean} = \frac{1}{2}$$

1. No, it may be good once or twice but not forever.
2. Honesty pays in a long run.

Ans.42 $\frac{10}{13}$, speaking truth pays in the long run. Sometimes lie told for a good cause is not bad.

Ans.43 $126 \times (0.6)^4 (0.4)^4$ or $126(0.24)^4$

Yes, addiction of wine or smoking is definitely harmful for a person and its family.

Ans.44 (i) $\frac{1}{22}$

(ii) Yes, because a cheater finds it to do any work independently. But it is harmful in long run.

Ans.45 $\frac{3}{4}$

Factors :-

- (i) Regular study
- (ii) Hard work
- (iii) Good memory
- (iv) Well time management
- (v) Writing skills

Ans.46 $\frac{3}{8}$

- (i) It gives positive thinking & satisfaction
- (ii) Everyone loves it.
- (iii) It is good life skill

Ans.47

x	0	1	2
$p(x)$	$\frac{156}{380}$	$\frac{182}{380}$	$\frac{42}{380}$

I would like to be a vegetarian because vegetarian food is much easier to digest than non vegetarian (may be given other reason) Or For non- vegetarian food we have to kill animals this is not good thing because everybody has right to survive, etc.

Ans.48 $\frac{7}{8}$

A Student is future of a country. If a student is sincere then he/she can serve the country in a better way.

Ans.49 $\frac{27}{82}$

Pollution free environment minimize the health problems in the human being.

Ans.50

X	0	1	2	3
$P(x)$	$\frac{27}{64}$	$\frac{27}{64}$	$\frac{9}{64}$	$\frac{1}{64}$

Values lost by chairman –
Honesty, Integrity

Ans.51 $\frac{15}{24}$, skilled person can complete a work in better way than other person

Ans.52

X	0	1	2
$P(x)$	$\left(\frac{11}{20}\right)^2$	$2 \cdot \frac{9}{20} \cdot \frac{11}{20}$	$\left(\frac{9}{20}\right)^2$

To maintain the ratio of male and female equally. This is important to consider both children are equal.

Ans.53 0.225, People in anger cannot use their presence of mind and become violent and destroy public property in riots which is indirectly their own property.

Ans.54 0.75 self studies with the help of peers is best as through it students can get the knowledge in depth of each concept. But students should be regular in school and if they feel need they could join different classes.