Vishwakarma Government Engineering College
Chandkheda Ahmedabad
Sem-3 Probability & Statistics (3130006)
Faculty: J V Adeshara

	QUESTIONS	
	UNIT NO- 1 : **Basic Probability**	
	TOPIC : Probability	
Sr. No	**DESCRIPTIVE QUESTIONS**	**Marks**
1	Define Mutually exclusive events and Exhaustive events with suitable examples **[V.G.E.C]**	**03**
2	Two students x and y work independently on a problem. The probability that x will solve it is 3/4 and the probability that y will solve it is 2/3. What is the probability that problem will be solved? **[V.G.E.C]**	**02**
3	In a bolt factory, three machines A, B & C manufacture 25%, 35% and 40% of the total product respectively. Of these outputs 5%, 4% and 2% respectively, are defective bolts. A bolt is picked up at random and found to be defective. What are the probabilities that it was manufactured by machines A, B & C ? **[V.G.E.C]**	**06**
4	A person is known to hit the target 3 out of 4 shots, whereas another person is known to hit the target in 2 out of 3 shots. Find the probability of the target being hit at all when they both try. **[V.G.E.C]**	**03**
5	A multiple choice test consist of 8 questions with 3 answer to each question (of which only one is correct). A student answers each question by rolling a balanced dice and checking the first answer if he gets 1 or 2, the second answer if he gets 3 or 4 and the third answer if he gets 5 or 6. To get a distinction, the student must secure at least 75% correct answers. If there is no negative marking, what is the probability that the student secure a distinction? **[V.G.E.C]**	**07**
6	A company has two plants to manufacture hydraulic machine. Plant I manufactures 70% of the hydraulic machines and Plant II manufactures 30%. At plant I, 80% of hydraulic machines are rated standard quality and at plant II, 90% of hydraulic machines are rated standard quality. A machine is picked up at random and is found to be of standard quality. What is the chance that it has come from plant I? **[V.G.E.C]**	**03,07**
7	Four cards are drawn from a pack of cards. Find the probability that (i) all are diamonds (ii) there is one card of each suit (iii) there are two spades and two hearts.**[V.G.E.C]**	**03**
8	State Baye's theorem. A microchip company has two machines that produce the chips. Machine I produces 65% of the chips, but 5% of its chips are defective. Machine II produces 35% of the chips and 15% of its chips are defective. A chip is selected at random and found to be defective. What is the probability that it came from Machine I?**[V.G.E.C]**	**04**
9	An urn contains 10 white and 3 black balls, while another urn contains 3 white and 5 black balls. Two balls are drawn from the first urn and put into the second urn and then a ball is drawn from the latter. What is the probability that it is a white ball? **[V.G.E.C]**	**07**
10	Potholes on a highway can be a serious problem. The past experience suggests that there are, on the average, 2 potholes per mile after a certain amount of usage. It is assumed that the Poisson process applies to the random variable "number of potholes." What is the probability that no more than 4 potholes will occur in a given section of 5 miles?**[V.G.E.C]**	**03**
11	In a certain assembly plant, three machines, B1, B2, and B3, make 30%, 45%, and 25%, respectively, of the products. It is known from past experience that 2%, 3%, and 2% of the products made by each machine, respectively, are defective. Now, suppose that a finished product is randomly selected. What is the probability that it is defective?**[V.G.E.C]**	**04**
12	In producing screws, let A mean "screw too slim" and B "screw too short". Let P(A)=0.1 and let the conditional probability that a slim screw is also too small be P(B/A)=0.2. What is the probability that the screw that we pick randomly from the lot produced will be both too slim	**03**

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	and too short?**[V.G.E.C]**	
13	Three boxes contain 10%, 20% and 30% of defective finger joints. A finger joint is selected at random which is defective. Determine the probability that it comes from i) 1^{st} box ii) 2^{nd} box iii) 3^{rd} box.**[V.G.E.C]**	**07**
14	If *3* of *12* car drivers do not carry driving license, what is the probability that a traffic inspector who randomly checks *3* car drivers, will catch *1* for not carrying driving license (use binomial dist.) **[V.G.E.C]**	**03**
15	A room has three lamp sockets. From a collection of *10* light bulbs of which only *6* are good. A person selects *3* at random and puts them in the socket. What is the probability that the room will have light? **[V.G.E.C]**	**04**
16	A diagnostic test has a probability of 0.95 of giving a positive result when applied to a person suffering from a certain disease, and a probability 0.10 of giving a (false) positive when applied to a non – sufferer. It is estimated that 0.5 % of the population are sufferers. Suppose that the test is now administered to a person about whom we have no relevant information relating to the disease (apart from the fact that he/she comes from this population). Calculate the following probabilities : (a) That the test result will be positive; (b) That, given a positive result, the person is a sufferer; (c) That, given a negative result, the person is a non – sufferer; (d) That the person will be misclassified.**[V.G.E.C]**	**07**
17	In a box, 100 bulbs are supplied out of which 10 bulbs have defects of type A, 5 bulbs have defects of type B and 2 have defects of both types. Find the probabilities that a bulb to be drawn at random has a B type defect under the condition that it has an A type defect. **[V.G.E.C]**	**03**
18	In how many different ways can the director of a research laboratory choose 2 chemists from among 7 applicants and 3 physicists from among 9 applicants? **[V.G.E.C]**	**03**
19	A class consists of 6 girls and 10 boys. If a committee of three is chosen at random from the class, find the probability that, (i) three boys are selected; (ii) exactly two girls are selected. **[V.G.E.C]**	**04**
20	An unbiased coin is tossed 6 times. Find the probability of getting (i) exactly 4 heads, (ii) at least 4 heads. **[V.G.E.C]**	**04**
21	Define and give an example of: (i) Exhaustive Events, (ii) Mutually Exclusive Events. **[V.G.E.C]**	**03**
22	The average grade of male students in the class was 6.2 and that of females was 7.3. The mean grade of all the students was 6.53. Find the percentage of male and female students. **[V.G.E.C]**	**03**
23	If 6 of 18 new buildings in a city violate the building code, what is the probability that a building inspector, who randomly selects 4 of the new buildings for inspection, will catch (i) None, (ii) One, (iii) at least 3, of the new buildings that violate the building code? **[V.G.E.C]**	**04**

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UNIT NO- 2 :
Some Special Probability Distributions

TOPIC : Probability Distributions

NUMERICALS

1 A book contains 100 misprints distributed randomly throughout its 100 pages. What is the probability that a page observed at least two misprints? Assume Poisson Distribution. **[V.G.E.C]** — **07**

2 The average percentage of failure in a certain examination is 40. What is the probability that out of a group of 6 candidates, at least 4 passed in examination? **[V.G.E.C]** — **04**

3 In a sampling a large number of parts manufactured by a machine, the mean number of defectives in a sample of 20 is 2. Out of 1000 such sample, how many would be expected to contain exactly two defective parts?**[V.G.E.C]** — **04**

4 A machine produces on average of 500 items during first week of the month and on average of 400 items during the last week of the month. The probability for these being 0.68 and 0.32. Determine the expected value of the production.
[HINT: Use Mathematical expectation for discrete random variable. **V.G.E.C]** — **03**

5 Assume that on the average one telephone number out of fifteen called between 1 p.m. and 2 p .m. on week days is busy. What is the probability that if 6 randomly selected telephone numbers are called (i) not more than three, (ii) at least three of them would be busy? **[V.G.E.C]** — **04**

6 A car hire firm has two cars, which it hires out day by day. The number of demands for a car 03 on each day is distributed on a Poisson distribution with mean 1.5. Calculate the proportion of days on which neither car is used and proportion of days on which some demand is refused. $(e^{-1.5} = 0.2235)$ **[V.G.E.C]** — **03**

7 In a photographic process, the developing time of prints may be looked upon as a random variable having the normal distribution with a mean of 16.28 seconds and a standard deviation of 0.12 second. Find the probability that it will take
(i) anywhere from 16.00 to 16.50 seconds to develop one of the prints;
(ii) at least 16.20 seconds to develop one of the prints;
(iii) at most 16.35 seconds to develop one of the prints.
[P(z = 1.83) = 0.9664, P(z = 0.66) = 0.7454, P(z = 0.58) = 0.7190][**V.G.E.C]** — **07**

8 The compressive strength of samples of cement can be modelled by a normal distribution with a mean 6000kg/cm^2 and a standard deviation of 100kg/cm$^{2.}$
1) What is the probability that a sample's strength is less than 6250 kg/cm$^{2.}$
2) What is the probability if sample strength is between 5800 and 5900 kg/cm$^{2.}$
3) What strength is exceeded by 95% of the samples?
*[P(z = 2.5) = 0.9938, P(z = 1) = 0.8413, P(z = 2) = 0.9772, P(z = 1.65) = 0.9]***[V.G.E.C]** — **07**

9 The following table gives the probabilities that a certain computer will malfunction 0,1,2,3,4,5 or 6 times on any one day: — **06**

No. of mal-functions x	0	1	2	3	4	5	6
Prob. $f(x)$	0.17	0.29	0.27	0.16	0.07	0.03	0.01

Find the mean and standard deviation of this probability distribution. **[V.G.E.C]**

10 The breaking strength X[kg] of a certain type of plastic block is normally distributed with a mean of 1250 kg and a standard deviation of 55 kg. What is the maximum load such that we can expect no more than 5% of the block to break? **[V.G.E.C]** — **04**

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11 For the probability function $f(x) = \frac{k}{1+x^2}$, $-\infty < x < \infty$, find k. **[V.G.E.C]** — **03**

12 The probability that a person catch swine flu virus is 0.001. find the probability that out of 3000 persons (i) exactly 3, (ii) more than 2 persons will catch the virus. (F (2;$\boldsymbol{\lambda}$) = 0.42))**[V.G.E.C]** — **03**

13 A random variable having the normal distribution with $\mu = 18.2$ and $\sigma = 1.25$, find the probabilities that it will take on a value (i) less than 16.5 (ii) between 16.5 And 18.8 *(F (0.48) = 0.3156 , F (–1.36) = 0.0869)***[V.G.E.C]** — **03**

14 For the following probability distribution — **07**

X	1	2	3	4	5	
F(x)	0.1	0.1	0.2	0.3	0.3	

Find the mean and variance (ii) Find the distribution function. **[V.G.E.C]**

15 Weights of 500 students of a college are normally distributed with average weight 95 lbs and standard deviation 7.5. find how many students have the weight between 100 and 110 lbs. ($P\ (X \leq 2) = 0.9772$, $P(X \leq 0) = 0.5$, $P(X \leq 0.67) = 0.7486$) **[V.G.E.C]** — **04**

16 Write formula for binomial distribution when n and p is known. If $n = 4$ and $p = 0.2$, then prepare binomial distribution for the random variable X. Also , find $E(x), V(X), E(3X + 7)$ and $V(3X + 7)$.**[V.G.E.C]** — **07**

17 Three coins are tossed to gather and let random variable X be the number of heads in each outcome. Then find (a) Probability distribution, (b) Mean and (c) standard deviation. **[V.G.E.C]** — **04**

18 At checkout counter customers arrive at an average of 2.0 per minute. Find the probabilities that
(i) At most 3 will arrive in any given minute
(ii) At least 3 will arrive during an interval of 4 minutes
(iii) At most 10 will arrive during an interval of 6 minutes. **[V.G.E.C]** — **07**

19 Define: Mathematical Expectation. Given that $f(x) = k / 2^x$ is probability distribution for a random variable that can take on the values x = 0, 1, 2, 3, 4. Find k. **[V.G.E.C]** — **03**

20 A car hire firm has two cars which it hires out day to day. The number of demands for a car on each day is distributed as Poisson variate with mean 1.5. Calculate the proportion of days on which (i) neither car is used, and (ii) some demand is refused. **[V.G.E.C]** — **03**

21 The Probability distribution of a random variable *x* is given below — **07**

x	-2	-1	0	1	2
$p(x)$	$\frac{1}{12}$	$\frac{1}{3}$	p	$\frac{1}{4}$	$\frac{1}{6}$

Find (i) $E(x)$ (ii) $E(2x+3)$ (iii) $E(x^2+2)$. **[V.G.E.C]**

22 Find the expectation for the following discrete probability distribution: **[V.G.E.C]** — **03**

x	10	14	18	25	35
$p(x)$	0.125	0.225	0.325	0.200	0.125

23 Find the third moment about mean for the following frequency distribution: **[V.G.E.C]** — **04**

x	5	7	10	18	26
$frequency - f$	5	14	22	6	3

24 Which of the following define probability distribution (i) f(x) = $\frac{x-2}{10}$, x = 0,1,2,3,4 — **04**

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<table>
<tr><td></td><td>(ii) $f(x) = \frac{x}{6}, x = 0,1,2,3$ [V.G.E.C]</td><td></td></tr>
<tr><td>25</td><td>Find $P(A \cap B)$, given that $P(A) = \frac{1}{3}, P(B) = \frac{1}{4}$ & $P(A \cup B) = \frac{1}{5}$ [V.G.E.C]</td><td>03</td></tr>
<tr><td>26</td><td>The probability distribution of a commodity is given below.
<table>
<tr><td>Demand</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr>
<tr><td>Probability</td><td>0.05</td><td>0.10</td><td>0.30</td><td>0.40</td><td>0.10</td><td>0.05</td></tr>
</table>
Find expected demand. [V.G.E.C]</td><td>04</td></tr>
<tr><td>27</td><td>Obtain the binomial distribution for which mean is 10 and variance is 5 [V.G.E.C]</td><td>02</td></tr>
</table>

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UNIT NO- 3 :
Basic Statistics

TOPIC:1 : Moments & Mathematical Expectations

SHORT QUESTIONS (1 Mark) / MCQ / True-False/Fill in the blanks

Sr. No		Marks
1	Write the formulas for mean, median & mode. **[V.G.E.C]**	01
2	Write formula for central moments. **[V.G.E.C]**	01
3	Write formula for raw moments. **[V.G.E.C]**	01
4	Write relation between raw moments & central moments. **[V.G.E.C]**	01
5	Find arithmetic mean of following frequency distribution. **[V.G.E.C]**	01

x:	1	2	3	4
f:	4	5	2	1

6	What is mode of the following frequency distribution? **[V.G.E.C]**	01

Data value x:	1	2	3	4
Frequency f:	4	7	10	8

7	Find mean of temperature recorded in degree centigrade during a week in, where the temperature recorded are 38.2, 40.9, 39, 44, 39.6, 40.5, 39.5. **[V.G.E.C]**	01
8	Which measures are called the measures of central tendency? **[V.G.E.C]**	01

DESCRIPTIVE QUESTIONS

Sr. No		Marks
1	Obtain the Median for the following distribution: **[V.G.E.C]**	04

x	1	2	3	4	5	6	7	8	9
f	8	10	11	16	20	25	15	9	6

2	From the following data calculate moments about (i) Assumed mean (ii) Actual mean 25 (iii) zero. **[V.G.E.C]**	07

Variable	0-10	10-20	20-30	30-40
Frequency	1	3	4	2

3	The quantities of water (in litres) supplied by municipal corporation on ten consecutive days in certain area are shown below: 218.2, 199.7, 207.3, 185.4, 213.7, 184.7, 179.5, 194.4, 224.3, and 2035. Evaluate the mean and the first four central moments of the water (in liters) of that area. **[V.G.E.C]**	07
4	Find the first four moments of the following data about assumed mean 112.45 and actual mean. **[V.G.E.C]**	07

Class limit	100-104.9	105-109.9	110-114.9	115-119.9	120-124.9
Frequency	7	13	25	25	30

5	The following data represents the number of foreign visitors in a multinational company in every 10 days during last 2 months. Use the data to find median. **[V.G.E.C]**	04

x:	0-10	10-20	20-30	30-40	40-50	50-60
No. of visitors f:	12	18	27	20	17	06

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6 Find standard deviation from the following data. **[V.G.E.C]** **03**

Class	9-11	12-14	15-17	18-20
Frequency	2	3	4	1

7 Find Arithmetic mean from the following table. **[V.G.E.C]** **03**

x	35	45	55	60	75	80
f	12	18	10	6	3	11

8 Find the median by the data 2, 8, 4, 6, 10, 12, 4, 8, 14, 16.**[V.G.E.C]** **03**

9 Find the arithmetic mean for the following data: **[V.G.E.C]** **03**

x	35	45	55	60	75	80
f	12	18	10	6	3	11

10 A continuous r.v. X has a pdf $f(x) = \begin{cases} 3x^2 ; 0 \le x \le 1 \\ 0 \quad ; \text{elsewhere} \end{cases}$. Obtain the first four central moments. **[V.G.E.C]** **07**

11 Find the missing frequency when median is 24 **[V.G.E.C]** **04**

Marks	0-10	10-20	20-30	30-40	40-50
Students	15	20	x	14	16

12 Wages earned in Rupees per day by the labourers are given below the table: **04**

Wages in Rs.	10-20	20-30	30-40	40-50	50-60
No. of Labourers	5	8	13	10	8

Find the median of the distribution. **[V.G.E.C]**

13 Find the mode for the following distribution: **[V.G.E.C]** **04**

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
f	4	7	8	12	25	18	10

14 From the following distribution, find the mean and variance: **[V.G.E.C]** **04**

x	1	2	3	4	5
$f(x)$	0.1	0.1	0.2	0.3	0.3

15 Calculate the first four moments of the following distribution about the mean. **[V.G.E.C]** **07**

x	0	1	2	3	4	5	6	7	8
f(x)	1	8	28	56	70	56	28	8	1

16 Find the mean and median of the following data: **[V.G.E.C]** **07**

Classes:	0 – 30	30 – 60	60 – 90	90– 120	120 – 150	150 – 180
F:	8	13	22	27	18	7

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TOPIC:2 :Correlation & Regression

SHORT QUESTIONS (1 Mark) / MCQ / True-False/Fill in the blanks

Sr. No		Marks
1	The value of coefficient of correlation lies between _____and _____. **[V.G.E.C]** **Answer :** -1 and 1	01
2	If the two regression lines are perpendicular to each other, then the coefficient of correlation is _____. **[V.G.E.C]** **Answer :** Zero	01
3	If the regression coefficients are -0.1 and -0.9 then value of r=_____. **[V.G.E.C]** **Answer :** -0.3	01
4	If Coefficient of correlation$r = 0$, the two lines of regression are_____. **[V.G.E.C]** **Answer :** Perpendicular to each other	01
5	Define coefficient of correlation. **[V.G.E.C]**	01
6	For the two data sets represented by x and$y$, write the regression co- efficient of y on x. **[V.G.E.C]**	01

DESCRIPTIVE QUESTIONS

1 (04)

Find correlation coefficient for the data given below: **[V.G.E.C]**

x	4	5	9	14	18	22	24
y	16	22	11	16	7	3	17

2 (04)

The number of bacterial cells(X) per unit volume in a culture at different hours(Y) is given below: **[V.G.E.C]**

X	0	1	2	3	4	5	6	7	8	9
Y	43	46	82	98	123	167	199	213	245	272

Fit a line of regression of Y on X and estimate the number of bacterial cells after 15 hours.

3 (07)

Obtain the two regression lines from the following data and hence find the correlation coefficient. **[V.G.E.C]**

x	6	2	10	4	8
y	9	11	5	8	7

4 (07)

Explain co-relation, co-relation Types, co-relation co-efficient. Also state the methods to find correlation between two variables. Find the correlation co-efficient between the serum diastolic blood pressure & serum cholesterol levels of 10 randomly selected persons. **[V.G.E.C]**

5Persons	1	2	3	4	5	6	7	8	9	10
Cholesterol	307	259	341	317	274	416	267	320	274	336
Diastolic B.P.	80	75	90	74	75	110	70	85	88	78

5 (07)

Find the coefficient of correlation by spearman's method from the following data & comment on the result.

IQ X_i	106	86	100	101	99	103	97	113	112	110
Hours Y_i	7	0	27	50	28	29	20	12	6	17

The above data shows the correlation between the IQ of a person and number of hours spent in front of the TV per week by person. **[V.G.E.C]**

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6 From the following data obtain the two regression lines and Correlation coefficient: **[V.G.E.C]** **07**

x	100	98	78	85	110	93	80
y	85	90	70	72	95	81	74

7 Find the correlation coefficient from the following data: **[V.G.E.C]** **07**

X	50	50	55	60	65	65	65	60	60	50
Y	11	13	14	16	16	15	15	14	13	13

8 Find the equation of the line of regression based on the following data: **[V.G.E.C]** **07**

x	4	2	3	4	2
y	2	3	2	4	4

9 Compute the correlation coefficient between X and Y. **[V.G.E.C]** **07**

X	2	4	5	6	8	11
Y	18	12	10	8	7	5

10 In a college, IT department has arranged one competition for IT students to develop an efficient program to solve a problem. Ten students took part in the competition and ranked by two judges given in the following table. Find the degree of agreement between the two judges using Rank correlation coefficient. **[V.G.E.C]** **03**

Ist Judge	3	5	8	4	7	10	2	1	6	9
IInd Judge	6	4	9	8	1	2	3	10	5	7

11 Find the regression line X on Y from the following table. **[V.G.E.C]** **07**

X	1	2	3	4	5	6	7	8	9	10
Y	10	12	16	28	25	36	41	49	40	50

12 Compute correlation coefficient for the data given below. **[V.G.E.C]** **04**

x	4	5	9	14	18	22	24
y	16	22	11	16	7	3	17

$$\sum x = 96, \sum y = 92, \sum x^2 = 1702, \sum y^2 = 1464, \sum xy = 1047$$

13 Calculate the co-efficient of correlation between the given series of data for x and y in the following table: **[V.G.E.C]** **07**

x	54	57	55	57	56	52	59
y	36	35	32	34	36	38	35

14 Let $3x + 2y = 26$ and $6x + y = 31$ be the two regression lines. (i) Find the mean value and correlation coefficient between x and y (ii) if the variance of y is 4 find the standard deviation of x **[V.G.E.C]** **07**

15 Find the coefficient of correlation from the data: x=7,8,9,11,10,13,12
y = 1,2,3,4,5,6,7 **[V.G.E.C]** **04**

16 Calculate the coefficient of correlation for the following distribution. **[V.G.E.C]** **07**

x	5	9	15	19	24	28	32
y	7	9	14	21	23	29	30
f	6	9	13	20	16	11	7

17 Obtain the correlation coefficient for the following data: **[V.G.E.C]** **07**

x	100	98	78	85	110	93	80

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	y: 85, 90, 70, 72, 98, 81, 74	
18	Raw material used in the production of a synthetic fiber is stored in a place which has no humidity control. Measurements of the relative humidity in the storage place and the moisture content of a sample of the raw material (both in %) on 7 days yielded the following results: Humidity (x): 42, 35, 50, 43, 48, 62, 31 Moisture content(y): 12, 8, 14, 9, 11, 16, 7 Find the lines of regression of Y on X and X on Y. **[V.G.E.C]**	**07**
19	The ranks of same 16 students in Maths and MOS are as follows: Maths: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 MOS: 1, 10, 3, 4, 5, 7, 2, 6, 8, 11, 15, 9, 14, 12, 16, 13 Calculate the rank correlation coefficient for proficiencies of this group in given subjects. **[V.G.E.C]**	**04**

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	UNIT NO- 4 : Applied Statistics	
	TOPIC :Hypothesis and tests	
Sr. No	**DESCRIPTIVE QUESTIONS**	**Marks**
1	What is a statistical hypothesis? **[V.G.E.C]**	**03**
2	What are simple and composite statistical hypothesis?**[V.G.E.C]**	**04**
3	Explain the terms Null Hypothesis and Alternative Hypothesis.**[V.G.E.C]**	**04**
4	Explain t- Test for single mean.**[V.G.E.C]**	**07**
5	Describe F- test for ratio of variances **[V.G.E.C]**	**07**
6	Describe briefly Chi- square test for goodness of fit and independence of attributes. **[V.G.E.C]**	**07**
7	What are the applications of Chi- square test?**[V.G.E.C]**	**04**

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UNIT NO- 5 : CO : 5
Curve Fitting by the Numerical Methods

TOPIC : Fitting of Curves

SHORT QUESTIONS (1 Mark) / MCQ / True-False/Fill in the blanks

Sr. No		Marks
1	Write the normal equations to fit straight line. **[V.G.E.C]**	01
2	What is the order of polynomial of the curve $y = f(x)$ passing through the points $(1,-3)$, $(3,9)$, $(4,30)$ and $(6,139)$ **[V.G.E.C]**	01
3	Write the normal equations for the straight line $y = ab^x$. **[V.G.E.C]**	01
4	Write the normal equations for the curve $y = a + bx + cx^2$. **[V.G.E.C]**	01
5	Write the normal equations for the curve $y = a + bx^2$. **[V.G.E.C]**	01
6	Write the normal equations for the straight line $y = ae^{bx}$. **[V.G.E.C]**	01
7	Write the normal equations for the straight line $x = a + by$. **[V.G.E.C]**	01
8	What is meant by the curve of best fit? **[V.G.E.C]**	01

DESCRIPTIVE QUESTIONS

Sr. No		Marks
1	Fit a straight line for the data. **[V.G.E.C]** y: 12, 15, 21, 25 x: 50, 70, 100, 120	03
2	Find the least squares approximations of second degree for the following data. **[V.G.E.C]** x: -2, -1, 0, 1, 2 $y = f(x)$: 15, 1, 1, 3, 19	04
3	Fit a second degree polynomial using least square method to data given below. **[V.G.E.C]** x: 0, 1, 2, 3, 4 y: 1, 1.8, 1.3, 2.5, 6.3	07
4	Fit a polynomial of degree two using least square method for the following experimental data. Also estimate y(2.4). **[V.G.E.C]** x: 1, 2, 3, 4, 5 y: 5, 12, 26, 60, 97	07
5	By using Least Square Method fit second degree polynomial using the following data: **[V.G.E.C]** X: -3, -2, -1, 0, 1, 2, 3 Y: 12, 4, 1, 2, 7, 15, 30	07
6	If P is the pull required to lift a load W by means of a pulley block, find a linear approximation of the form $P = mW + c$ connecting P and W, using the following data: P: 13, 18, 23, 27 W: 51, 75, 102, 119 Where P and W are taken in $kg.wt$. **[V.G.E.C]**	03
7	Fit a second degree parabola $y = a + bx + cx^2$ to the following data: x: 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0 y: 1.2, 1.4, 1.9, 2.4, 2.8, 3.3, 4.2 **[V.G.E.C]**	07
8	Fit a straight line to the following data: **[V.G.E.C]** x: 0, 1, 2, 3, 4 y: 1, 1.8, 3.3, 4.5, 6.3	04
9	Fit a second degree parabola to the following data: **[V.G.E.C]** x: 1, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0	07

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		y	1.1	1.3	1.6	2.0	2.7	3.4	4.1	
10	Fit a second degree parabola to the following data: **[V.G.E.C]** x | 0 | 1 | 2 | 3 | 4 y | 1 | 1.8 | 1.3 | 2.5 | 6.3									**07**
11	Fit a second degree polynomial to the following data using least square method. **[V.G.E.C]** y | -3 | -2 | -1 | 0 | 1 | 2 | 3 x | 12 | 4 | 1 | 2 | 7 | 15 | 30									**04**
12	Fit the curve $y = ae^{bx}$ to the following data using least square technique.**[V.G.E.C]** x: | 1 | 2 | 3 | 4 | 5 y: | 7 | 11 | 17 | 27 | 43									**07**