SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act, 1956)

Course & Branch: B. Arch
Title of the paper: Mathematics II
Semester: II — Max. Marks: 80
Sub.Code: 621201 (2006/2007) — Time: 3 Hours
Date: 12-05-2008 — Session: FN

PART – A (10 x 2 = 20)

Answer All the Questions

1. Write down the empirical relation between mean, Medical and mode.

2. Define Coefficient of variation.

3. Write down the important tests for small samples.

4. Define null hypothesis and alternative hypothesis.

5. Define rank correlation.

6. Write down the normal equation for $y = a + bx + cx^2$.

7. Define distribution function.

8. Find the probability of getting 4 heads in 6 tosses of a fair coin.

9. Write the two regression lines.

10. Define small samples and large samples.

PART – B (5 x 12 = 60)

Answer All the Questions

11. (a) Find the median form the following data:

	below	below	below	below	below	below	below	Below
Marks	10	20	30	40	50	60	70	80
No. of Students	15	35	60	84	94	127	189	240

(b) Calculate the quartile deviation of the marks of 39 students given below:

	below	below	below	below	below	Below
Marks	0-5	5-10	10-15	10-20	20-25	25-30
No. of Students	4	6	8	12	7	2

(or)

12. (a) Calculate Mean and standard deviation for the data given below

Age	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of Members	3	61	132	153	140	51	2

(b) Obtain Karl pear son's coefficient of Skewness for the following distribution

Intervals	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequencies	6	8	17	21	15	11	2

13. (a) A sample of 26 bulbs given a mean life of 990 hours with standard of 20 hours. The manufacturer claims that the mean life of bulbs is 1000 hours. If the sample not upto the standard.

(b) The means of two random samples of size 9 and 7 are 196.46 and 198.82 respectively. The sum of the squares of the deviation from the mean is 26.94 and 18.73 respectively. Can the sample be considered to have been drawn from the same normal population?

(or)

14. (a) The following table give the number of aircraft accidents that occurred during the various days of the week. Test whether the accidents are uniformly distributed over the week.

Days	Mon	Tues	Wed	Thus	Fri	Sat
No. of Accidents	14	18	12	11	15	14

(b) In one sample of 8 observations the sum of the squares of deviation of the sample values from the sample mean was 84.4 and in the other sample of 10 observation it was 102-6 Test whether this difference is significant at 5% level.

15. Fit a least square quadratic curve for the following data and estimate y(2.4)

X	1	2	3	4
Y	1.7	1.8	2.3	3.2

(or)

16. (a) Calculate the coefficient of correlation, regression if x on y and regression of y on x for the data given below.

X	6	5	8	8	7	6	10	4	9	7
Y	8	7	7	10	5	8	10	6	8	6

17. (a) In 256 sets of 12 tossen of a Coin, in how many causes may one expect eight heads and four tails.

(b) Using poisson distribution, find the probability that the ace of spades will be drawn from a pack of well shuffled cards atleast once in 104 consecutive trials.

(or)

18. (a) In a test on 200 electric bulbs, it was found that the life of a particular make, was normally distributed with an average life of 2040 hours and S.D of 60 hours. Estimate the number of bulbs likely to burn for more that 2150 hours.

(b)Three machines M1, M2 and M3 Produce identical items of their respective output 5%, 4% and 3% of items are faulty. On a certain day, M1 has produced 25% of the total output, M2 has produced 30% and M3 the remainder. An item selected at random is found to be faulty. What are the chances that it was produced by the machine with the higest output.

19. (a) The probability density function of a variate X is

X	0	1	2	3	4	5	6
P(y)	k	3k	5k	7k	9k	11k	13k

Find $P(x < 4)$, $P(x \geq 5)$, $P(3 < x < 6)$ and also find k.

(b) Obtain the rank correlation coefficient for the data given below.

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

(or)

20. (a) Find the Mean deviation about the mean for the data given below :

Marks	0-10	10-20	20-30	30-40	40-50
No. of Students	5	8	15	16	6

(b) In a sample of 1000 people in Karnataka 540 are rice eaters and the rest are wheat eaters. Can we assume that both rice and wheat are equally popular in this state of 1% level.