

Name:	
Enrolment No:	

End Semester Examination, Dec 2017
Course: MATH 1003-Statistical & Quantitative Methods in Planning I
Programme: B. Plan
Semester: I (ODD-2017-18)
Time: 03 hrs. **Max. Marks:100**

Instructions:
 Attempt all questions from **Section A** (each carrying 4 marks); attempt all questions from **Section B** (each carrying 8 marks); attempt all questions from **Section C** (each carrying 20 marks).

Section A
(Attempt all questions)

1.	Write a short note on Statistics and Planning.	[4]	CO1												
2.	Write four limitations of Statistics.	[4]	CO1												
3.	Prepare a Frequency Polygon from the following data: Class Interval: 15-20 20-25 25-30 30-35 35-40 40-45 Frequency: 7 8 11 22 12 4	[4]	CO2												
4.	Construct Pie diagram for the following data: <table style="margin-left: 40px; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">Males</td> <td style="text-align: center;">Females</td> <td style="text-align: center;">Total</td> </tr> <tr> <td>City A</td> <td style="text-align: center;">60</td> <td style="text-align: center;">40</td> <td style="text-align: center;">100</td> </tr> <tr> <td>City B</td> <td style="text-align: center;">250</td> <td style="text-align: center;">150</td> <td style="text-align: center;">400</td> </tr> </table>		Males	Females	Total	City A	60	40	100	City B	250	150	400	[4]	CO2
	Males	Females	Total												
City A	60	40	100												
City B	250	150	400												
5.	Calculate the Geometric Mean of the following data: 5439 687 92 8 0.7 0.06 0.004 0.0003	[4]	CO3												

SECTION B
(Q6-Q9 are compulsory and Q10 has internal choice)

6.	Assuming a four yearly cycle, calculate the trend by the method of moving averages from data relating to the production of Tea in india. Year: 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 Production: 464 515 518 467 502 540 557 571 586 612	[8]	CO4
7.	Calculate the Arithmetic Mean from Direct Method from the following data: Groups: 0-7 7-14 14-21 21-28 28-35 35-42 42-49 49-56 Frequency: 26 31 35 42 82 71 54 19	[8]	CO3
8.	Differentiate between short term and long term fluctuations in a time series. Also bring out the difference between trend and cyclical fluctuations giving examples. Mention important use of time series analysis.	[8]	CO4
9.	Four students got the following marks out of 150 maximum marks: 50 70 90 110 Find out the Arithmetic Mean and the Standard deviation.	[8]	CO3

10.	<p>(i) Find the binomial distribution whose mean is 5 and variance is $10/3$. [4 marks]</p> <p>(ii) Ten percent of screws produced in a certain factory turn out to be defective. Find the probability that in a sample of 10 screws chosen at random, exactly two will be defective. [4 marks]</p> <p style="text-align: center;">OR</p> <p>Out of 800 families with four children each, how many families would be expected to have: (i) 2 boys and 2 girls; (ii) at least one boy; (iii) no girl; (iv) at most 2 girls. [8 marks]</p>	[8]	CO5
<p>SECTION C (Q11 is compulsory and Q12A, Q12B have internal choice)</p>			
11.A	<p>Three Machines M_1, M_2 and M_3 produce identical items. Of their respective output 5%, 4% and 3% of items are faulty. On a certain day, M_1 has produced 25% of the total output, M_2 has produced 30% and M_3 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 highest output.</p>	[10]	CO5
11.B	<p>Assuming that half the population of the town consumes chocolates and that 100 investigators each take 10 individuals to see whether they are consumers, how many investigators would you expect to report that three people or less were consumers?</p>	[10]	CO5
12.A	<p>A manufacturer knows that the condensers he makes contain on an average 1% of defectives. He packs them in boxes of 100. What is the probability that a box picked at random will contain 4 or more faulty condensers?</p> <p style="text-align: center;">OR</p> <p>If the probabilities of a bad reaction from a certain injection is 0.0002, determine the chances that out of 1000 individuals more than two will get a bad reaction.</p>	[10]	CO5
12.B	<p>Assume mean height of soldiers to be 68.22 inches with a variance of 10.8 inches square. How many soldiers in a regiment of 1000 would you expect to be over 6 feet tall? Given that the area under the standard normal curve between $z = 0$ and $z = 0.35$ is 0.1368 and between $z = 0$ and $z = 1.15$ is 0.3746.</p> <p style="text-align: center;">OR</p> <p>The average height of 500 students is 151 cm and the standard deviation is 15 cm. Assuming that the heights are normally distributed, find out that how many students have heights between 120 and 155 cm. Given that the area under the standard normal curve between $z = 0$ and $z = 0.27$ is 0.4808 and between $z = 0$ and $z = 0.27$ is 0.1084.</p>	[10]	CO5