Seat No.: _____ Enrolment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BPLAN – SEMESTER I– • EXAMINATION – WINTER 2016

Subject Code: 1015504 **Date: 03/01/2017**

Subject Name: Statistics and Quantitative Methods in Planning - I

Time:10:30 AM to 12:30 PM **Total Marks: 50**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 (a) Multiple choice question ***06***

1. Earthquake is example of which type of variation?
   a. Secular Trend
   b. Cyclic variation
   c. Seasonal variation
   d. Irregular variation
2. 9,7,6,7,5,4,5,7,9,3,6 – which are Mean and Mode in this data set?
   a. 4 and 9
   b. 6 and 7
   c. 6.18 and 7
   d. None
3. Average speed can be calculated using which one of this method?
   a. Arithmetic Mean
   b. Harmonic Mean
   c. Geometric Mean
   d. Weighted Mean
4. In Standard normal distribution, if value of standard score (z) of any particular observation is zero. So what dose it suggest?
   a. Value of that observation is equal to mean.

b. Value of that observation is greater than to mean.

c. Value of that observation is less than to mean.

d. None of the above.

5. Which one of these is not type of non-probability sampling?

a. Deliberate (Quota) sampling

b. Convenience sampling.

c. Systematic sampling.

d. Purposive sampling.

6. Which of the following is Not Measure of central tendency?

a. Harmonic mean.

b. Median.

c. Mode.

d. All these are measure of central tendency

(b) true - false ***04***

1. In simple random sampling, each observation has an equal probability of getting selected.
2. While calculating the mean of group data, we assume that every value in each class is equal to mid point of that class.
3. Shape of bell curve in standard normal probability is not always symmetrical.
4. Value of standard deviation is distance of all the observations from the mean line.

Q.2 (a) Table below, shows monthly expenditure of person A and Person B on different things. Represent this data with single Bar Graph. ***05***

Now, if monthly income for both the person A and B are 20,00 and 25,000 respectively. Drew Inferences for which of these person is spending more on "Books" with help of Pie Chart. (Remaining salary is monthly savings)

No.	Expenses	Person A	Person B
1	Food	4000	4500
2	House Rent	3500	4000
3	Travel	2000	2250
4	Books	3000	3250
5	Cloths	2500	4000

(b) Municipality of the city "Planningpur" and "Archidabad" are spending certain ***05***

amount on various services. The services are mentioned below.

No.	Services	Planningpur	Archidabad
1	Roads	15 Cr.	17.5 Cr.
2	Water Supply	10 Cr.	8 Cr.
3	Solid Waste Management	5 Cr.	4.5 Cr.
4	Public Buildings	4 Cr.	6 Cr.
5	Maintenance	6 Cr.	4 Cr.

Now, State Govt. of GTU wants to know which city is spending money efficiently. For that, they have given certain weightage to different services are as described.
Road – 35%, Water Supply – 20%, Solid Waste Management – 15%, Public Buildings – 10%, Maintenance – 20%

OR

(b) In one standard normal distribution, population mean (μ) is 800, and standard deviation (σ) is 100, find out the probability for given situations. (Include diagram in answers) (Use the table provided for Z-test) ***05***

1) Total probability of observations above 650.
2) Total probability of observations between 700 and 900.
3) Total probability of observations below 950.

Q.3 **(a)** Write short note ***10***

1. What is Data and what is different types of data?
2. Explain: Secular Trend, Seasonal Variation(With Example)

OR

Q.3 **(a)** Write short note

1. Explain: Simple random sampling, Stratified sampling, Systematic sampling.
2. What is time series analysis? And what are the components of Time series analysis?

Q.4 **(a)** Arrange the given data set in ascending or descending order and construct a frequency distribution table. Draw a histogram and cumulating frequency graph. (min. 5 groups) ***05***

60	72	126	110	91
115	112	80	66	101
75	93	129	105	113

121	99	87	119	111
97	89	114	128	84
114	108	78	68	125

Q.4 (b) **Short Note:** Explain any one method for calculating measure of secular trend with proper example. (Freehand curve, Semi average Method, Moving average Method) ***05***

OR

Q.4 (b) **Short note:** What is statistics and what is the importance of statistics in planning field? ***05***

Q.5 (a) The given data is an annual income of a planning firm over a period of 5 years, calculate average % increase in Income for this firm. ***05***

Year	Income
2009	1,00,000
2010	1,50,000
2011	1,75,000
2012	1,60,000
2013	2,10,000

OR

Q.5 (a) 1. Calculate the Population Variance and Population standard deviation for given dataset. ***05***

Class	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-109	110-119	120-129
Frequency	4	7	8	10	11	18	13	10	9	6	3	1

(b) For XYZ technical institute, there are three different branches of Planning, Architecture and Engineering. Now Management of the institute has divided every student in three categories based on their performance. The categories are: Excellent, Average and Poor. ***05***

Now, as shown in given table,

Branch / Performance	Planning	Architecture	Engineering
Excellent	5	8	12
Average	12	15	28
Poor	3	7	10

If any one student is selected randomly, then what is the probability of that student is from planning or his performance is poor.

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Standard Normal Probability distribution between Mean and Value of ‘z’

	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0	0	0.004	0.008	0.012	0.016	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.091	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.148	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.17	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.195	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.219	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.258	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.291	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.334	0.3365	0.3389
1	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.377	0.379	0.381	0.383
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.398	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.437	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.475	0.4756	0.4761	0.4767
2	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.483	0.4834	0.4838	0.4842	0.4846	0.485	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.489
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.492	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.494	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4855	0.4956	0.4957	0.4959	0.496	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.497	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.498	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.499	0.499