

**VPM's**  
**DR VN BRIMS, Thane**  
**Programme: MMS (2015-17)**  
**Second Semester Examination April 2016**

<b>Subject</b>	<b>Business Research Methods (Common Subject For All Specializations)</b>		
<b>Roll No.</b>		<b>Marks</b>	<b>60 Marks</b>
<b>Total No. of Questions</b>	<b>7</b>	<b>Duration</b>	<b>3 Hours</b>
<b>Total No. of printed pages</b>	<b>2</b>	<b>Date</b>	<b>21/04/2016</b>

**Note: Q1 is compulsory and solve any FOUR from the remaining SIX questions.**

**Q1) 20 Marks (Compulsory)**

A market researcher is doing a research on how certain market variables are related to each other. For the purpose of understanding the same he takes a product and studies its sales in different marketplaces in two cities and the money spent on promotion for the same. His observations are as follows. The sales and the promotion expenses are measured in Rs. lakhs.

City	A	B	A	B	A	B	A	B	B
Sales	256	486	589	658	569	547	523	215	298
Promotion	12	25	35	45	10	45	23	26	16

a) How are the sales and the promotion related? Which test will you to find the same? Test the strength of the relation by taking  $\alpha = 5\%$ .

b) Does the sales vary with the city? Justify which method you will apply to find this? Use  $\alpha = 10\%$ .

**Attempt Any FOUR from the Remaining SIX Questions**

**Q2) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

a) What is 'exploratory research design'?

b) What are 'projective techniques'?

c) What are the advantages and disadvantages of 'observation'? Which are the situations in which observation should be used?

**Q3) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

a) What are the different sources / reasons of error that can be incurred on the part of the measurer?

b) What are the characteristics of measurement? Explain with examples.

c) What are the various non-comparative scales in measurement?

**Q4) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

a) Explain the different types of data viz. nominal, ordinal, interval and ratio data. Give an example of each type data.

b) Explain the various components of 'data preparation'.

c) Explain any 3 of 'Simple Random Sampling', 'Systematic Random Sampling', 'Judgment Sampling', and 'Haphazard Sampling'.

**Q5) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

a) Explain parametric tests, non-parametric tests, one-tail test and two-tail test.

b) What are the different types of research reports?

c) What are the components of a research report?

**Q6) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

a) A company claims that the average time taken to charge their mobile phone fully is less than 40 minutes. To verify this claim a researcher takes a sample of 60 phones and finds the average time taken to charge a phone 37.5 minutes. Based on past experience the standard deviation for

the population is 8.6 minutes. Is the claim of the company correct? Take  $\alpha = 10\%$ .

b) Elections are held in a state. A sample of voters from 2 constituencies is taken and is bifurcated into two age categories as seniors (age 60 or above) and non-seniors (age below 60 years). Test the hypothesis that the proportion of the two age categories is same in both the constituencies. Take  $\alpha = 5\%$ .

Constituencies	Seniors	Non-seniors
A	560	840
B	820	880

c) A company is accepting steel plates of length 140 cm from a manufacturer. A consignment of 2000 plates arrives at the company warehouse. The purchase department chooses a sample of 50 plates and checks their sizes. The average length of the sample is 141 cm. The sample standard deviation is 2 cm. Is the sample significantly different from the benchmark of 140 cm for  $\alpha = 5\%$ ?

**Q7) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

a) The pizza delivery times for 3 pizza joints has been noted as shown in the table below. For each pizza joint 4 observations have been taken. State whether there is any significant difference in the delivery times for the three joints for  $\alpha = 5\%$ . All figures in minutes.

Joint A	19	29	30	25
Joint B	16	29	33	16
Joint C	21	28	18	31

b) A health provider company wants to estimate the average amount of money people spend per month on medicines. The accuracy expected for the study is within  $\pm$  Rs. 100 range. The confidence interval of the estimate should be 99%.

A pilot survey shows the standard deviation to be Rs. 690.

What is the minimum sample size for the study?

c) What is the relation between the calorie (independent variable) and the weight (dependent variable) for the following data? Do not calculate the strength of the relation.

Calorie Intake	560	230	240	289	485	865
Weight	69	76	65	61	75	89

### Common Formulae

Regression Equation:  $y = a + bx$

$$b = \frac{\sum x_i y_i - n \bar{x} \bar{y}}{\sum x_i^2 - n \bar{x}^2}$$

$$a = \bar{y} - b \bar{x}$$

$$\frac{(k-1)}{\sum (x_{1i} - \bar{x}_1)^2 + \sum (x_{2i} - \bar{x}_2)^2} \cdot (N-k)$$

$$\text{Alternately, } F = \frac{n_1 \sum (\bar{x}_1 - \bar{X})^2 + n_2 \sum (\bar{x}_2 - \bar{X})^2 + n_3 \sum (\bar{x}_3 - \bar{X})^2}{\frac{k-1}{(n_1-1)s_1^2 + (n_2-1)s_2^2 + (n_3-1)s_3^2} \cdot (N-k)}$$

$$r = S_{xy} / S_x * S_y$$

$$r = \frac{\sum (x_i y_i) - n \bar{x} \bar{y}}{\sqrt{\sum x_i^2 - n \bar{x}^2} \sqrt{\sum y_i^2 - n \bar{y}^2}}$$

Alternatively,