

Name:
Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Online End Semester Examination, May 2021

Course: Business Analytics (with Excel)
Program: BA (EE)
Course code: DSBA 2001

Semester: IV
Time: 03 Hours
Max. Marks: 100

Attempt all Questions

Marks

CO

Select the most appropriate answer.

**6 X
5=30**

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1. The staffs of the accounting and the quality control departments rated their respective supervisor's leadership style as either (1) authoritarian or (2) participatory. Sixty-eight percent of the accounting staff rated their supervisor "authoritarian," and thirty-two percent rated him "participatory." Forty percent of the quality control staff rated their supervisor "authoritarian," and sixty percent rated her "participatory." The best graphic depiction of these data would be two _____.

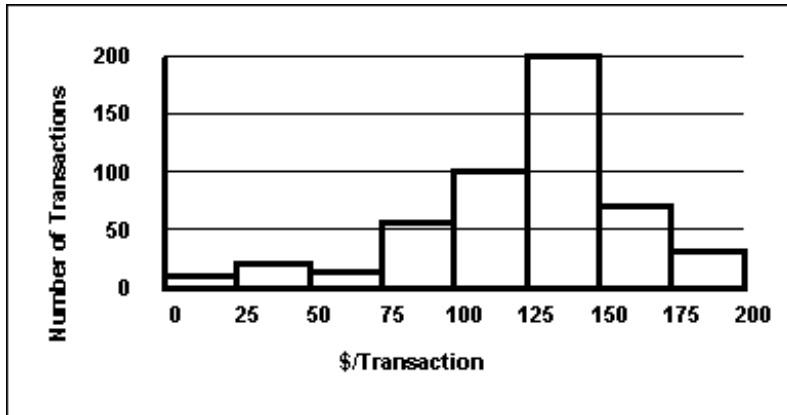
(a) Histograms
(b) Ogives
(c) Pie charts
(d) Scatter plots
2. Sue Taylor, Director of Global Industrial Sales, is concerned by a deteriorating sales trend. Specifically, the number of industrial customers is stable at 1,500, but they are purchasing less each year. She orders her staff to search for causes of the downward trend by selecting a focus group of 40 industrial customers. For this study, the set of 40 industrial customers is _____.

(a) a parameter
(b) a sample
(c) the population
(d) a statistic
3. A market analyst is developing a regression model to predict monthly household expenditures on groceries as a function of family size, household income, and household neighborhood (urban, suburban, and rural). The response variable in this model is _____.

(a) family size
(b) expenditures on groceries

- (c) household income
- (d) suburban

4. Each day, the office staff at Oasis Quick Shop prepares a frequency distribution and a histogram of sales transactions by dollar value of the transactions. Friday's histogram follows.



On Friday, the approximate number of sales transactions between \$100 and \$150 was _____.

- (a) 100
- (b) 200
- (c) 300
- (d) 400

5. Which of the following analytics use the concept of operations research?

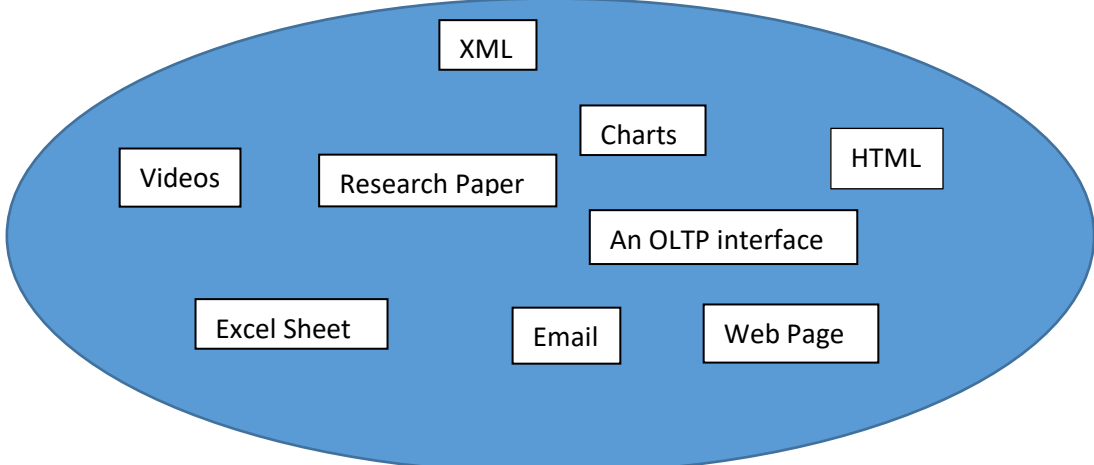
- (a) Prescriptive
- (b) Predictive
- (c) descriptive
- (d) All of the above

6. Which one is an advantage of OLTP system :

- (a) Simplicity
- (b) Efficiency
- (c) Fast Query processing
- (d) All of the above

SECTION B

Q	Attempt all the questions	10X 5=50	
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1.	<p>Classify the given data into three categories: Structured, Semi-Structured and unstructured</p> 		CO ₂
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2.	<p>Ajay is the head of the inspection department of an auto motive company ABC auto. His job is to make sure that the parts produced adhere to the specification required. Every day he meets his subordinates and gives them instructions on how to inspect the products. While inspecting, it is a general customer that the entire population of products is not inspected. Instead, a sample of the population is inspected and the result are analyzed to arrive at the population characteristics. On the previous day, he was assigned a work of inspecting 20 crankshafts. He decided to analyses a sample of 8 crankshafts and arrive at the results for the population. All the crankshafts in the population are assigned an equal probability of being selected that is (1/20). To select the sample randomly he uses the simple random sampling. He can also sample every second sample, so that he has 10 samples. In the latter case, it will be called systematic random sampling. He decides to use both techniques and compare his results. Using excel answer the following questions :</p> <table border="1"> <thead> <tr> <th>Part no.</th> <th>length of the part</th> </tr> </thead> <tbody> <tr><td>1</td><td>23</td></tr> <tr><td>2</td><td>26</td></tr> <tr><td>3</td><td>67</td></tr> <tr><td>4</td><td>54</td></tr> <tr><td>5</td><td>45</td></tr> <tr><td>6</td><td>33</td></tr> <tr><td>7</td><td>35</td></tr> <tr><td>8</td><td>34</td></tr> <tr><td>9</td><td>65</td></tr> <tr><td>10</td><td>55</td></tr> </tbody> </table>	Part no.	length of the part	1	23	2	26	3	67	4	54	5	45	6	33	7	35	8	34	9	65	10	55		CO ₂
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11	56
12	57
13	58
14	36
15	38
16	56
17	45
18	45
19	44
20	47

- (a) Use simple random sampling to take samples for inspection of parts.
(b) Use systematic random sampling to take samples for inspection of parts

3. (a) Using a suitable example explain the relationship of Business Analytics Process and Organization Decision-Making Process.
- OR**
- (b) With Suitable example explain the difference between descriptive analytics and predictive analytics.

CO₂

4. Vijay is in the research and development department of an insurance company ABC. He is give an assignment of finding the satisfaction levels of the customers who bought the insurance pension product ABC Jeevan Shram of his company in the last 3 years. This is the crucial assignment since the results could help the management in taking important decision for future regarding their products. Obviously, Vijay feels the pressure. At first, Vijay feels that it could be a little difficult to make the customers spent time on their survey. So he decides that some intensive could draw the customers to tale the survey. Thus this problem of getting the customers to take the survey seems to be solved.
- Vijay has the following data of satisfaction level of the product ABC Jeevan Shram of customers of last 3 years.

Customer	Gender	Satisfaction level on a scale of 1 to 10
1	F	7
2	F	8
3	M	6
4	F	9
5	M	5
6	M	7
7	F	8

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8	M	9
9	F	7
10	F	8
11	F	7
12	M	8
13	M	6
14	F	9
15	F	5
16	M	7
17	M	8
18	M	9
19	F	7
20	F	8
21	M	7
22	F	8
23	F	6
24	F	9
25	M	5
26	M	7
27	M	8
28	F	9
29	F	7
30	F	8

- (a) Find the average satisfaction level of customers who bought the company's product ABC Jeevan shram in the last 3 years and the deviation in satisfaction level of a typical customers.
- (b) Compare the average satisfaction level of male and female customers

5. A supplier of a household disinfectant liquid launched a promotional campaign to increase sales of its 500 ml bottles. *Before the campaign*, the average weekly sales (in cases sold) were recorded at 12 randomly chosen retail outlets throughout KwaZulu- Natal. Three weeks *after the campaign*, average weekly sales were again recorded at the *same 12 outlets*. The average weekly sales (in cases sold) are shown for each of the 12 retail outlets as follows:

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Outlet	Sales (in cases)	
	Before	After
1	12	12
2	8	11
3	14	14
4	9	9
5	13	11
6	15	16
7	10	11
8	12	13
9	10	11
10	13	13
11	12	14
12	10	11

Can the suppliers of the household disinfectant conclude that the promotional campaign has been a success? Test this management question statistically.

- Why is this a matched-pairs *t-test*? Explain.
- Formulate the null and alternative hypotheses to answer this management question.
- Conduct a matched-pairs *t-test using the Excel* at the 5% significance level. What is your conclusion? Interpret the appropriate p-value of our output.

SECTION-C

Q	Attempt the question :	20 X 1=20	CO4																																				
1.	<p>A bank wanted to find out whether the number of loan applications received are influenced by the current loan interest rate. The manager selected 11 monthly periods for which different interest rates applied and recorded the <i>number of loan applications received</i>.</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th colspan="12">Loan applications received</th> </tr> <tr> <th>Interest rate (%)</th> <td>7.0</td><td>6.5</td><td>5.5</td><td>6.0</td><td>8.0</td><td>8.5</td><td>6.0</td><td>6.5</td><td>7.5</td><td>8.0</td><td>6.0</td> </tr> <tr> <th>Loan applications</th> <td>18</td><td>22</td><td>30</td><td>24</td><td>16</td><td>18</td><td>28</td><td>27</td><td>20</td><td>17</td><td>21</td> </tr> </thead> </table> <ol style="list-style-type: none"> Identify the independent variable and the dependent variable. Show the data graphically in a scatter plot. What relationship is observed? Calculate the correlation coefficient between the rate of interest and the number of loan applications received. Comment on the strength of the association. Test the association between the rate of interest and number of loan applications received for statistical significance. Use $\alpha = 0.05$. Show the null and alternative hypotheses and interpret the findings of the hypothesis test. Interpret the meaning of the regression coefficient (b_1) of the independent variable. How many loan applications can the bank expect to receive when the interest rate is 6%? 	Loan applications received												Interest rate (%)	7.0	6.5	5.5	6.0	8.0	8.5	6.0	6.5	7.5	8.0	6.0	Loan applications	18	22	30	24	16	18	28	27	20	17	21		
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