Roll No.													

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF LAW

TEST 1

Semester: Odd Sem 2019-20
Course Code: BBL 301
Course Name: QUANTITATIVE TECHNIQUES
Program & Sem: BBA.,/B.COM.,LL.B. & I

Date: 30.09.2019
Time: 9.30AM to 10.30AM
Max Marks: 30
Weightage: 15%

Instructions:

(i) Read the questions carefully.
(ii) Don't skip calculation steps.

Part A [Memory Recall Questions]

Answer all the Questions. Each Question carries two marks. **(5Qx2M=10M)**

1. Which of the following are examples of the null set, justify your answer. (C.O.NO.3) [Knowledge]

   (i) Set of odd natural numbers divisible by 2
   (ii) {x: x is a natural numbers, x<5 and x>7}

2. State whether each of the following statement is true or false. Justify your answer. (C.O.NO.3) [Comprehension]

   (i) {2, 3, 4, 5} and {3, 6} are disjoint sets.
   (ii) A={x: x is an even natural number} and B={x: x is a prime number} are disjoint sets.

3. Explain briefly the difference between discrete and continuous data and give one example for each. (C.O.NO.2 & 1) [Knowledge]

4. Let A= {1, 2, 3, 4, 5, 6}. Define a relation R from A to A by R= {(x, y): y = x + 1}, write down the domain, codomain and range of R. (C.O.NO.3) [Knowledge]

5. The matrix $A=\begin{bmatrix}0 & 0 & 8\\ 0 & 4 & 0\\ 2 & 0 & 0\end{bmatrix}$ is a; (C.O.NO.3) [Knowledge]

   (i) Scalar matrix
   (ii) Diagonal matrix
   (iii) Square matrix
   (iv) Identity matrix

Part B [Thought Provoking Questions]

Answer both the Questions. Each Question carries five marks. **(2Qx5M=10M)**

6. If $A=\begin{bmatrix} 0 & 6 & 7 \\ -6 & 0 & 8 \\ 7 & -8 & 0 \end{bmatrix}$, $B=\begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 2 \\ 1 & 2 & 0 \end{bmatrix}$, $C=\begin{bmatrix} 2 \\ -2 \\ 3 \end{bmatrix}$

   Calculate AC, BC and (A+B)C. Also, find out which matrix operation property (properties) you can verify using these values. (C.O.NO.3) [Comprehension]

7. Bill Tench and Holden Ford are two FBI agents, who work as special agents in the FBI's Behavioral Science Unit. For their research work, they interviewed imprisoned serial killers to understand how they think, with the hope of applying this knowledge to solve ongoing cases. First of all, they just created a list of all the serial killers (of past 30 years) from different provinces prisons and collected their case details and background. They personally met all of them and tried to collect information related to the killers' psychological behavior and their motive behind the crimes they committed. That information they think will be helpful to apprehend similar criminals easier in future.

   Now for this situation, explain about the data collection technique Bill Tench and Holden Ford have adopted for their research and explain the advantages and limitations of that data collection technique. (C.O.NO.1 & 2) [Comprehension]

Part C [Problem Solving Questions]

Answer the Question. The Question carries ten marks. **(1Qx10M=10M)**

8. Given below is the score of 120 students of BBA-LLB in Quantitative Techniques course. (C.O.01 & 02) [Knowledge]

71	85	41	88	98	45	75	66	81	38	52	67	92	62	83
49	64	52	90	61	58	63	91	57	48	75	89	73	64	80
67	76	65	76	65	61	68	84	72	57	77	63	52	56	41
60	55	75	53	45	37	91	57	40	73	66	76	52	88	62
78	68	55	67	39	65	44	47	58	68	42	90	89	39	69
48	82	91	39	85	44	71	68	56	48	90	44	62	47	83
80	96	69	88	74	44	38	74	93	39	72	56	46	71	80
46	54	77	58	81	70	58	51	78	64	84	50	95	87	59

   Represent the given data graphically in any one standard graphic forms.

SCHOOL OF LAW

Semester: I

Course Code: BBL301

Course Name: Quantitative Techniques

Date: 30-09-2019

Time: 1 Hour

Max Marks: 30

Weightage: 15%

Extract of question distribution [outcome wise & level wise]

Q.NO.	C.O.NO	Unit/Module Number/Unit /Module Title	Memory recall type [Marks allotted] Bloom's Levels			Thought provoking type [Marks allotted] Bloom's Levels				Problem Solving type [Marks allotted]			Total Marks
			K			C				A			
1	Knowledge	1	K	K									
2	Knowledge	1	K	K									
3	Comprehension	1				C	C	C	C				
4	Comprehension	1				C	C						
5	Knowledge	2	K										
6	Knowledge	1	K										
7	Knowledge	1	K										
8	Comprehension	1				C							

9	Comprehensi on	1				C	C						
10	Comprehensi on	2				C							
11	Knowledge	2	K										
12	Knowledge	1	K										
	Total Marks												

K =Knowledge Level C = Comprehension Level, A = Application Level

Note: While setting all types of questions the general guideline is that about 60%

Of the questions must be such that even a below average students must be able to attempt, About 20% of the questions must be such that only above average students must be able to attempt and finally 20% of the questions must be such that only the bright students must be able to attempt.

[I hereby certify that All the questions are set as per the above guide lines. Mr. Syed Aqib Jalil]

Reviewers' Comments

SCHOOL OF LAW

SOLUTION

Semester: I
Course Code: BBL301
Course Name: Quantitative Techniques

Date: 30-09-2019
Time: 1 hour
Max Marks: 30
Weightage: 15%

Part A (05 x 02 = 10)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
1	(i) {17, 26, 35, 44, 53, 62, 71, 80} (ii) {-2, -1, 0, 1, 2}	Part (i) : 1 Mark Part (ii) : 1 Mark	3 Min
2	(i) Null Set (ii) Null Set	Part (i) : 1 Mark Part (ii) : 1 Mark	3 Min
3	(i) $\subset$ (ii) $\subset$ (iii) $\not\subset$ (iv) $\subset$	Part (i) : 0.5 Mark Part (ii) : 0.5 Mark Part (iii) : 0.5 Mark Part (iv) : 0.5 Mark	3 Min
4	(i) No, 3 is common (ii) No, 2 is common	Part (i) : 1 Mark Part (ii) : 1 Mark	3 Min
5	**Discrete Data:** is the one which are measured in fixed numbers. Such data are essentially count data. E.g. the incoming flights at an airport. **Continuous Data:** is the one with value between any two points on a line segment, thus representing an interval of values. E.g. Height of a group	Part (i) : 1 Mark Part (ii) : 1 Mark	3 Min
6	Domain = {1, 2, 3, 4, 5} Range = {2, 3, 4, 5, 6} Co-domain = {1, 2, 3, 4, 5, 6}	2 Marks for correct answer	3 Min
7	(iii)	2 Marks for correct answer	3 Min

Part B (02 x 05 = 10)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
8	$AC = \begin{bmatrix} 9 \\ 12 \\ 30 \end{bmatrix}$, $BC = \begin{bmatrix} 1 \\ 8 \\ -2 \end{bmatrix}$, $(A+B)C = \begin{bmatrix} 10 \\ 20 \\ 28 \end{bmatrix}$	1 Mark for AC 1 mark for BC 2 Mark for (A+B)C 1 Mark for identification of property	12 min

	Property: AC+ BC = (A+B)C		
9	(i) 52 (ii) 30	2.5 Marks for (i) 2.5 Marks for (ii)	12 min
10	Data collection by interview **Advantages:** respondents can answer questions on their own time, and may answer more honestly as questionnaires provide anonymity (whether real or perceived). And while the responses may be biased on the part of the participant, they are free from the collector's bias. **Limitations:** low response rate, delay in response, and the possibility of ambiguous or missing answers (and since questionnaires are a passive tool, it's usually not possible to receive clarification).	2 marks for identifying the data collection technique 1.5 marks for writing advantages 1.5 marks for writing for limitations	12 min

Part C (01 x 10 = 10)

Q No	**Solution**	**Scheme of Marking**	**Max. Time required for each Question**
11	Student has to construct Histogram or Frequency polygon or cumulative frequency curve	10 marks for correctly drawing any of the mentioned diagram	20 min
12	x = 3, y = 6, z = 9, t = 6 $A^{-1} = \begin{bmatrix} \frac{-1}{6} & \frac{1}{4} \\ \frac{1}{6} & \frac{-1}{12} \end{bmatrix}$, $C^{-1} = \begin{bmatrix} -3 & \frac{5}{2} \\ 2 & \frac{-3}{2} \end{bmatrix}$	3 marks for finding the values of x, y, z and t 3.5 marks for finding A^{-1} 3.5 marks for finding C^{-1}	20 min

Roll No												

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF LAW

END TERM FINAL EXAMINATION

Semester: Odd Semester: 2019 - 2020 | **Date**: 31 December 2019

Course Code: BBL 301 | **Time**: 9:30 AM to 12:30 PM

Course Name: QUANTITATIVE TECHNIQUES | **Max Marks**: 100

Program & Sem: BBA.LL.B./B.COM.LL.B. & I | **Weightage**: 50%

Instructions:

(i) Read the all questions carefully and answer accordingly.
(ii) Use of calculator is allowed.
(iii) Histogram is to be plotted on graph paper.

Part A [Memory Recall Questions]

Answer all the Questions. Each Question carries 3 marks. **(10Qx3M=30M)**

1. In a college there are 20 teachers who teach QT or Economics. Of these, 12 teach QT and 4 teach both QT and Economics. How many teach Economics? (C.O.No.1) [Knowledge]

2. Find $A \times B$ if, $A = \begin{bmatrix} 1 & -1 & 2 \\ 0 & 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 7 \\ -1 & 1 \\ 5 & -4 \end{bmatrix}$. (C.O.No.1) [Knowledge]

3. Name and explain any three sampling techniques. (C.O.No.1&3) [Knowledge]

4. Describe the advantages and limitations of statistics. (C.O.No.1&3) [Knowledge]

5. Find the mean, median and mode of the following numbers. (C.O.No.1&3) [Knowledge]

   15, 10, 25, 8, 21, 37, 6 and 21.

6. Write the relation between the three central tendencies when the data is normal, right skewed and left skewed. (C.O.No.1&3) [Knowledge]

7. For any two variables x and y, (C.O.No.1&3) [Knowledge]
   i) Can the correlation coefficient be 3.86?
   ii) If their correlation coefficient is -1, what does it signify?
   iii) If the linear regression equation is $y = \beta_1 + \beta_2 x$, what does β_1 and β_2 represent?

8. Fill in the blanks; (C.O.No.1&3) [Knowledge]
   i) _____ index number accounts for the relative importance of the items.
   ii) In most of the weighted index numbers the weight pertains to _____ .
   iii) A consumer price index measures change in _____ .

9. A card is drawn at random from a well shuffled deck of 52 cards. Calculate the probability that the card will be (C.O.No.1&4) [Knowledge]
   (i) a King. (ii) not a King.

10. A bag contains 6 red balls, 9 white balls and 5 green balls. One ball is taken out of the bag at random. What is the probability that the ball taken out will be;
    i) Red? (ii) White? (iii) Green? (C.O.No.1&3) [Knowledge]

Part B [Thought Provoking Questions]

Answer all the Questions. Each Question carries 10 marks. (3Qx10M=30M)

11. Calculate variation and standard deviation (using the relation between variance and standard deviation) of the following frequency distribution:

Classes	1-10	10-20	20-30	30-40	40-50	50-60
Frequency	11	29	18	4	5	3

(C.O.No.1&2) [Comprehension]

12. There are three urns, the urn I contains 2 white and 3 black balls, urn II contains 3 white and 2 black balls, and urn III contains 4 white and 1 black balls, respectively. There is an equal probability of each urn being chosen. A ball is drawn at random from the chosen urn and it is found to be white. Find the probability that the ball drawn was from the second urn.
(C.O.No.1&4) [Comprehension]

13. An enquiry into the budgets of the middle class families in a certain city gave the following information; (C.O.No.1&3) [Knowledge]

Expenses on items	Food 30%	Fuel 15%	Clothing 15%	Rent 20%	Misc. 20%
Price (in ₹) in 2018	2000	750	1250	800	900
Price (in ₹) in 2009	1800	650	1000	600	750

Part C [Problem Solving Questions]

Answer both the Questions. Each Question carries 20 marks. (2Qx20M=40M)

14. A group of twelve children participated in a psychological study designed to assess the relationship, if any, between age and average total sleep time (ATST). To obtain a measure for

ATST, recordings were taken on each child on five consecutive nights and then averaged. The results obtained are shown in the table below; (C.O.No.1&3) [Comprehension]

Child	A	B	C	D	E	F	G	H	I	J	K	L
Age	4.4	6.7	10.5	9.6	12.4	5.5	11.1	8.6	14.0	10.1	7.2	7.9
ATST	586	565	515	532	478	560	493	533	575	490	530	515

Using the above data;

i) Calculate the correlation coefficient between the given two variables and also write the significance the correlation coefficient you obtained.

ii) Write the regression equation for the given variables and graphically plot the regression equation you obtained.

15. Given below are the marks of 150 students of BBALLB in Quantitative techniques course. Construct frequency table for the marks with class interval of 10. Also, plot histogram for the given data. [20] (C.O.No.1&3) [Comprehension]

58	72	45	80	86	68	38	30	86	57	57	94	37	41	39
32	75	48	80	38	89	45	88	98	40	26	37	41	76	88
66	59	55	65	42	93	29	28	62	79	80	70	38	85	84
54	45	57	31	33	79	50	80	42	93	72	27	85	82	98
62	48	98	91	38	53	83	43	92	74	92	42	81	61	72
41	72	30	30	82	75	60	52	42	49	72	47	33	44	46
39	47	84	79	70	65	75	31	92	41	51	25	82	58	36
92	85	94	85	47	62	91	74	29	95	31	52	90	84	69
54	29	37	46	81	66	81	59	26	87	74	38	71	38	37
38	63	90	61	49	36	96	32	55	33	25	79	69	61	40

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

SCHOOL OF LAW

END TERM FINAL EXAMINATION

Extract of question distribution [outcome wise & level wise]

Q.NO.	C.O.NO (% age of CO)	Unit/Module Number/Unit /Module Title	Memory recall type [Marks allotted] Bloom's Levels	Thought provoking type [Marks allotted] Bloom's Levels	Problem Solving type [Marks allotted]	Total Marks
			K	C	A	
1	2	1	3			3
2	2	1	3			3
3	1 & 3	2	3			3
4	1 & 3	2	3			3
5	1 & 3	3	3			3
6	1 & 3	3	3			3
7	1 & 3	4	3			3
8	1 & 3	4	3			3
9	1 & 4	5	3			3
10	1 & 4	5	3			3
11	1 & 3	3		10		10
12	1 & 4	5	10			10
13	1 & 3	4		10		10
14	1 & 3	4		20		20

15	1 & 3	2		20		20
	Total Marks		40	60		100

K =Knowledge Level C = Comprehension Level, A = Application Level

Note: While setting all types of questions the general guideline is that about 60%

Of the questions must be such that even a below average students must be able to attempt, About 20% of the questions must be such that only above average students must be able to attempt and finally 20% of the questions must be such that only the bright students must be able to attempt.

I hereby certify that all the questions are set as per the above guidelines.

Faculty Signature:

Reviewer Commend:

Format of Answer Scheme

SCHOOL OF ENGINEERING

SOLUTION

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

Semester: Odd Sem. 2019-2020
Course Code: BBL-301
Course Name: QUANTITATIVE TECHNIQUES
Program & Sem: BBALLB/BCOMLLB (I SEM)

Date: 31.12.2019
Time: 3 HRS
Max Marks: 100
Weightage: 50%

Part A (10Q x 03M = 30Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
1	12 teacher teach Economics	**3 marks for correct answer**	**5 Minutes**
2	$AB = \begin{bmatrix} 13 & -2 \\ 17 & -13 \end{bmatrix}$	**3 marks for correct answer**	**5 Minutes**
3	Description of any three of the following Simple random sampling, stratified sampling, systematic sampling, cluster sampling	**1 mark for each sampling technique**	**5 Minutes**
4	Description of the advantages and limitations of the statistics	**3 marks for correct answer**	**5 Minutes**
5	Mean= 17.87 Median= 18 Mode= 21	**1 mark for each correct answer**	**5 Minutes**
6	Normal: Mean = Median = Mode Right Skewed: Mean > Median > Mode Left Skewed: Mean < Median < Mode	**1 mark for each correct relation**	**5 Minutes**
7	i) No ii) Perfectly negatively correlated iii) Intercept and slope	**1 mark for each correct answer**	**5 Minutes**

8	i) Weighted ii) Base year iii) Retain price	**1 mark for each correct answer**	**5 Minutes**
9	i) 1/13 ii) 12/13	**1.5 marks for each correct answer**	**5 Minutes**
10	i) 3/10 ii) 9/20 iii) 1/4	**1 mark for each correct answer**	**5 Minutes**

Part B (03Q x 10M = 30 Mark

Q No	Solution	Scheme of Marking	Max. Time required for each Question
11	Variance=161 SD=12.7	**8 Marks for Variance and 2 marks for SD**	**20 Minutes**
12	Probability= 1/3	**10 marks for correct answer**	**20 Minutes**
13	Answer= 120.0577 It is increased by 20.058%	**10 Marks for correct answer**	**20 Minutes**

Part C (02Q x 20M = 40Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
14	Correlation coefficient = -0.481 And write the regression equation	**12 marks for correlation coefficient 8 marks for regression**	**30 Minutes**
15	They have to plot frequency table and plot the histogram	**10 marks for frequency table and 10 marks for histogram**	**30 Minutes**