Name: **Enrolment No:**	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2018

Course: Aviation Forecasting **Semester: III**
Programme: MBA AVM **CC: TRAV8005**
Time: 03 hrs. **Max. Marks: 100**
Instructions:

SECTION A **2x10=10**

S. No.	**Attempt all of the following, each question carry two marks.**		
Q 1	Forecasting vs Prediction	**2**	**CO 1**
Q 2	Relationship between forecasting, planning and decision-making	**2**	**CO 1**
Q 3	Long term forecasts	**2**	**CO 1**
Q 4	Seasonality	**2**	**CO 1**
Q 5	Components of time series	**2**	**CO 1**
Q 6	Monte Carlo Simulation model	**2**	**CO 1**
Q 7	Market share forecasting	**2**	**CO 1**
Q 8	MLRM	**2**	**CO 1**
Q 9	Stationary Series	**2**	**CO 1**
Q 10	ARIMA	**2**	**CO 1**

SECTION B
Attempt any Four **4x5=20**

<table>
<tr><td>Q 1</td><td>There are total of 100,000 people that using airline during any given month. Forty five thousand people may be using Indigo, which will be called state 1. Twenty five thousand people may using Jet airways, which will be called state 2, and 30,000 people may be shopping at Go air, which will be called state 3. Determine the market share of each airline for next year using matrix of transition probabilities of those airlines.

<table><tr><td></td><td>Indigo</td><td>Jet Airways</td><td>Go air</td></tr><tr><td>Indigo</td><td>0.8</td><td>0.1</td><td>0.1</td></tr><tr><td>Jet Airways</td><td>0.4</td><td>0.25</td><td>0.35</td></tr><tr><td>Go air</td><td>0.2</td><td>0.6</td><td>0.2</td></tr></table></td><td>5</td><td>CO4</td></tr>
<tr><td>Q 2</td><td>Use this data to develop a regression model to predict cost by number of passengers. Interpretate the regression coefficient. The data is showing the costs and associated number of passengers for twelve 500-mile commercial airline flights using Boeing 737s during the same season of the year.

$\sum xy = 68.745, \sum x^2 = 1689, \overline{X} = 77.5, \overline{Y} = 4.73$</td><td>5</td><td>CO2</td></tr>
<tr><td>Q 3</td><td>What is the difference between quantitative and qualitative approach of forecasting?</td><td>5</td><td>CO3</td></tr>
<tr><td>Q 4</td><td>How Jury of Executive Opinion method can be applied for forecasting passengers for green field airport at new location?</td><td>5</td><td>CO3</td></tr>
<tr><td>Q 5</td><td>Fit a trend line for this data using regression model (Results value upto three places of decimals). Forecast for 2020.
<table><tr><th>Year</th><th>Passengers (thousands)</th></tr><tr><td>2005</td><td>92</td></tr><tr><td>2006</td><td>94</td></tr><tr><td>2007</td><td>98</td></tr><tr><td>2008</td><td>99</td></tr><tr><td>2009</td><td>98</td></tr><tr><td>2010</td><td>103</td></tr><tr><td>2011</td><td>107</td></tr><tr><td>2012</td><td>116</td></tr><tr><td>2013</td><td>136</td></tr><tr><td>2014</td><td>163</td></tr><tr><td>2015</td><td>190</td></tr><tr><td>2016</td><td>215</td></tr><tr><td>2017</td><td>248</td></tr></table></td><td>5</td><td>CO3</td></tr>
<tr><td colspan="4">SECTION-C
Attempt any three 3x10=30 Marks</td></tr>
<tr><td>Q 1</td><td>How Delphi method can be used for aviation demand forecasting.</td><td>10</td><td>CO2</td></tr>
</table>

<table>
<tr><td>Q 2</td><td>Boeing aircraft Tire sells all types of tires, but a popular radial tire accounts for a large portion of Boeing overall sales. Recognizing that inventory costs can be quite significant with this product, Boeing wishes to determine a policy for managing this inventory.
<table>
<tr><th>Daily Demand</th><th>Probability</th></tr>
<tr><td>0</td><td>0.1</td></tr>
<tr><td>15</td><td>0.15</td></tr>
<tr><td>25</td><td>0.2</td></tr>
<tr><td>35</td><td>0.5</td></tr>
<tr><td>45</td><td>0.12</td></tr>
<tr><td>50</td><td>0.02</td></tr>
</table>
Also determine a policy while considering the following demand sequence of random numbers. 21, 27, 47, 54, 60, 39, 43, 91, 25, 20.</td><td>10</td><td>CO3</td></tr>
<tr><td>Q 3</td><td>Determine whether cyclical variation on trend line is affecting times series data or not
<table>
<tr><th>Year</th><th>Passengers (thousands)</th></tr>
<tr><td>2005</td><td>407</td></tr>
<tr><td>2006</td><td>419</td></tr>
<tr><td>2007</td><td>415</td></tr>
<tr><td>2008</td><td>424</td></tr>
<tr><td>2009</td><td>467</td></tr>
<tr><td>2010</td><td>489</td></tr>
<tr><td>2011</td><td>509</td></tr>
<tr><td>2012</td><td>560</td></tr>
<tr><td>2013</td><td>641</td></tr>
<tr><td>2014</td><td>717</td></tr>
<tr><td>2015</td><td>838</td></tr>
<tr><td>2016</td><td>1077</td></tr>
<tr><td>2017</td><td>1307</td></tr>
</table></td><td>10</td><td>CO3</td></tr>
<tr><td>Q 4</td><td>Forecast Passengers for next quarter using exponential smoothing method and exponential smoothing coefficient (α) is 0.45.
<table>
<tr><td>Year</td><td>Quarter 1</td><td>Quarter 2</td><td>Quarter 3</td><td>Quarter 4</td></tr>
<tr><td>2014</td><td>170</td><td>180</td><td>205</td><td>230</td></tr>
<tr><td>2015</td><td>220</td><td>285</td><td>215</td><td>295</td></tr>
<tr><td>2016</td><td>345</td><td>300</td><td>330</td><td>320</td></tr>
<tr><td>2017</td><td>465</td><td>410</td><td>440</td><td>490</td></tr>
</table></td><td>10</td><td>CO4</td></tr>
<tr><td colspan="2">SECTION-D</td><td>30 Marks</td><td></td></tr>
<tr><td>Q 1</td><td>Can amount of Freight be predicted using regression analysis? Given table represents FREIGHT (In Thousand MT) and GDP of India. Establish linear regression model and determine these followings (Results upto three places of decimals)-</td><td>20</td><td>CO4</td></tr>
</table>

a) Fit Multiple Linear regression model

b) Predict freight amount when GDP is 1200 and IIP is 350.

FREIGHT (IN Thousand MT)	GDP of India	IIP
649	448	123
681	482	130
705	502	139
699	533	145
797	580	154
846	602	162
854	631	167
979	655	176
1068	707	189
1278	763	204
1397	834	222
1550	911	251
1714	1000	290
1701	1039	297

Q 2

Using ATMs data (in thousands) of Delhi airports for given below- Estimates the following

Year	Quarter 1	Quarter 2	Quarter 3	Quarter 4
2015	320	185	215	395
2016	345	200	230	420
2017	365	210	240	440

a) Compute the 3rd order moving average.

b) Compute the 4th order moving average.

c) Which model is better and also evaluate the forecast.

10

CO3