

Name:

Enrolment No:



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

Course : Aviation Forecasting Techniques
Programme : MBA (AVM)
Course Code: TRAV 8018

Semester: III
Time: 03 hrs.
Max. Marks: 100

Instructions: All questions are compulsory

SECTION A (20 Marks)

1. Each Question will carry 2 Marks

2. Choose the correct answer.

S. No.	Questions	Marks	CO
Q 1	What do you mean by transport demand?	2	CO1
Q 2	If the price of ticket increases, what happens to the transport demand?	2	CO2
Q 3	List any four drivers of transport demand.	2	CO2
Q 4	Give the formula for elasticity of transport activity with respect to GDP.	2	CO1
Q 5	When do we use proxy variables?	2	CO3
Q 6	What percent range of consensus among empaneled experts in Delphi technique considered as 'moderate consensus'?	2	CO2
Q 7	Write the general equation for simple linear regression.	2	CO2
Q 8	Give one example of non-linear function for trend projection.	2	CO3
Q 9	What condition should be satisfied by weights given in weighted moving average for forecasting?	2	CO2
Q 10	What in an artificial neuron is analogous to the function of synapse in a biological neuron?	2	CO3

SECTION B (20 Marks)

1. Each question will carry 5 marks

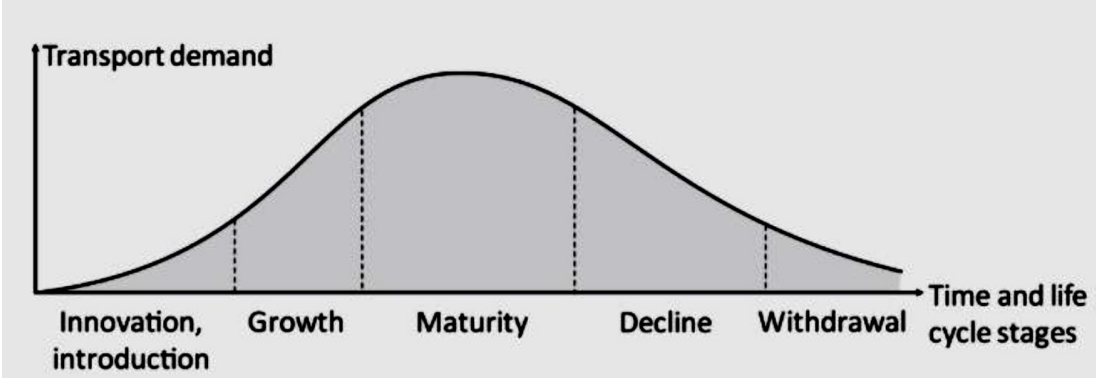
2. Instruction: Answer precisely, write legibly and stepwise.

Q 11	How does demand forecasting affect the transport system?	5	CO4
Q 12	What do you mean by diverted demand? Explain with example from transportation.	5	CO3
Q 13	What are independent and dependent variables? If air passenger traffic is the dependent variable, what can be the independent variables in a multiple regression equation?	5	CO1
Q 14	Illustrate through a scatter plot of dependent variable Y and independent variable X, the correlation when there exists a strong negative correlation between Y and X.	5	CO4

SECTION-C (30 marks)

1. Each question will carry 10 marks

2. Instruction: Answer precisely, write legibly and stepwise.

Q 15	<p>From Figure 1, explain with reasons how accurately can GDP be used for forecasting passenger demand and freight demand for India and Japan?</p> <p align="center">OR</p> <p>Give examples from transport systems for each of the lifecycle stages of transport products or services as illustrated in the figure 2 below:</p>  <p align="center"><i>Figure 2. Lifecycle stages over time for transport demand of a product or service</i></p>	10	CO3
Q 16	Give the steps involved in forecasting using the Delphi technique.	10	CO2

Q 17

In simple linear regression of Bell Helicopters revenue (dependent variable) with the worldwide shipments of rotorcrafts (independent variable) following results were obtained with coefficient of determination (R-squared) of 0.61:

Table 1 Results of simple linear regression of Bell Helicopters revenue with worldwide shipments of rotorcrafts (data source: Statista.com)

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	1517.61	677.99	2.24	0.07
Shipments of rotorcrafts	1.61	0.52	3.07	0.02

Interpret the above results in terms of (2.5 marks each):

- Is the R-squared acceptable, satisfactory or very satisfactory? Why?
- Is the intercept significant? Why?
- Is the independent variable's coefficient of regression significant? Why?
- From the above answers, explain whether you can use the worldwide shipments of rotorcrafts for forecasting the revenue of Bell Helicopters?

10

CO4

SECTION-D (30 marks)

1. Each question will carry 15 marks

2. Instruction: Answer precisely, write legibly and stepwise.

Q 18

Based on information provided in Figure 3 and Table 2, answer the following questions (5 marks each):

- What do you mean by training set? How is it used in trend projection forecasting?
- What do you mean by validation set? How is it used in trend projection forecasting?
- Which trendline is best suited for forecasting monthly air passenger traffic at Ahmedabad airport? Why?

Figure 3. Comparison of forecasts using trend projection and validation set of monthly air passengers at Ahmedabad airport.

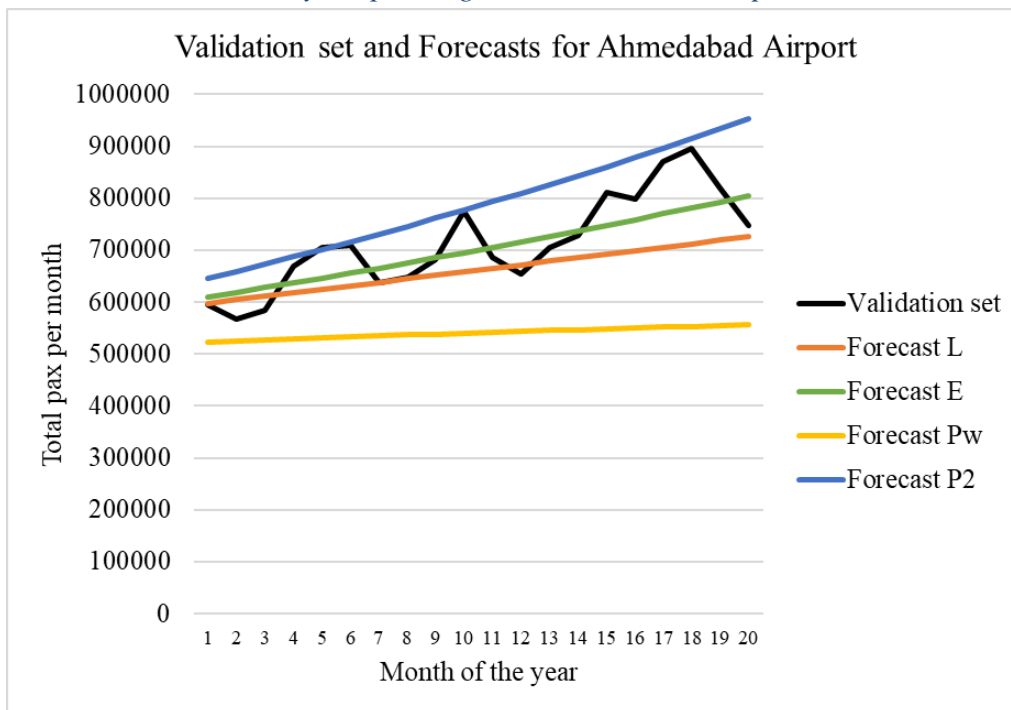


Table 2. Average Deviation from the validation set and R-squared of the trendline generated from the training set.

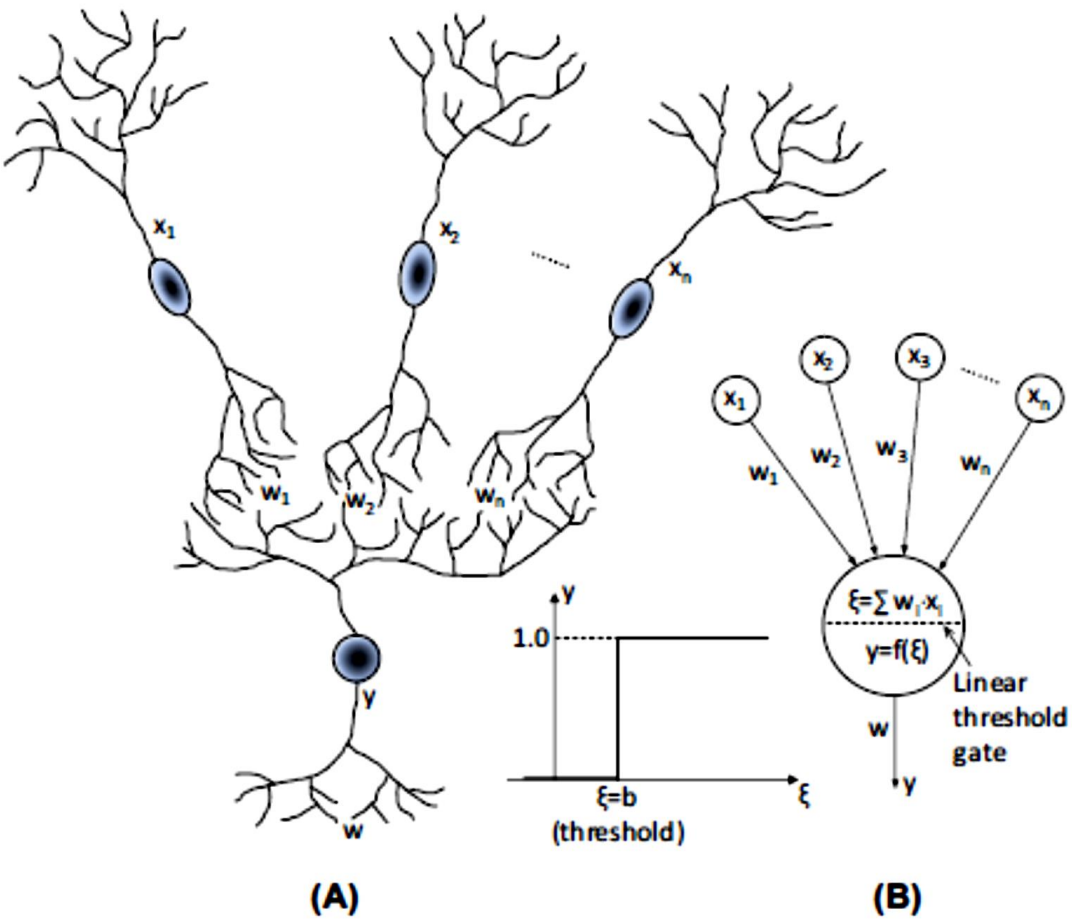
Forecast	Average Deviation	R ²
Linear (L)	8%	0.77
Exponential (E)	6%	0.77
Power (Pw)	23%	0.53
Polynomial Order 2 (P2)	11%	0.8

15

CO4

Q 19

In figure 4 below, what do you mean by x_i , w_i , ξ , b , and y in the artificial neuron? How are they analogous to the functions of a biological neuron?



15

CO2

Figure 4. Analogies between (A) a biological neuron and (B) an artificial neuron.