



**UNIVERSITY OF PETROLEUM & ENERGY STUDIES  
DEHRADUN**

**End Semester Examination-May 2017**

<b>Program/course</b>	<b>: MBA AVM</b>	<b>Semester</b>	<b>: II</b>
<b>Subject</b>	<b>: Econometrics</b>	<b>Max. Marks</b>	<b>: 100</b>
<b>Code</b>	<b>: MBCE702</b>	<b>Duration</b>	<b>: 3 Hrs</b>
<b>No. of page/s</b>	<b>: 11</b>		

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**Section-A**

**Q1. Answer the questions:**

**10 X 2= 20**

- I. Regression analysis deals with estimating the mean value of \_\_\_\_\_.
- a. Dependent variable                      c. Random variable  
b. independent variable                      d. Residuals
- II. Which of the following statements is true concerning the population regression function (PRF) and sample regression function (SRF)?
- a. The PRF is the estimated model  
b. The PRF is used to infer likely values of the SRF  
c. Whether the model is good can be determined by comparing the SRF and the PRF  
d. The PRF is a description of the process thought to be generating the data.
- III. When the estimated slop coefficient in the simple regression model  $\hat{\beta}_2$ , is zero, then
- a.  $r^2 = 0$     c.  $0 \leq r^2 \leq 1$



- X. The least square estimators are interval estimators.
- a. True
  - b. false
  - c. Partially true
  - d. Can't be said

**Section B**

**Attempt any four questions**

**4X5 = 20**

Q2. The regression result of passenger air traffic (PAT) is given below. State which explanatory variables are statistically and significantly affecting PAT.

PAT	$\beta$ Coeff.	Calculated t-Value	Critical t-Value (at 5%)
X1	-0.016	-3.29	1.697
X2	0.028	3.61	1.697
X3	0.059	2.51	1.697
X4	0.320	3.64	1.697
X5	-0.072	-1.40	1.697
X6	0.360	4.32	1.697
X7	-12.03	-1.11	1.697
X8	1.770	9.83	1.697
Const.	-78.99	-4.47	1.697

Q3. From the regression result of cargo air traffic (CAT), p-values are given below. State at what level independent variables are affecting CAT significantly.

CAT	$p >  t $	Level of Sig.
X1	0.016	
X2	0.010	
X3	0.000	
X4	0.223	
X5	0.027	

Q4. Formulate one passenger air traffic (PAT) function, write down its functional form and econometric specification for the following variables:

PAT: passenger air traffic

GDP: Gross Domestic Product

M: Import of goods

X: Export of goods

Q5. Consider the following regression output:

$$\hat{Y}_i = 0.2033 + 0.6560X_i$$

$$se = (0.0976) \quad (0.1961)$$

$$P = (0.005) \quad (0.003)$$

$$RSS = 0.0544 \quad ESS = 0.0358 \quad r^2 = 0.397$$

Where,  $Y$  = Passenger air traffic

$X$  = Per capita GDP

The regression results were obtained from a sample of 19 countries.

- How do you interpret this regression?
- Test the hypothesis that  $H_0: \beta_2 = 0$  against  $H_1: \beta_2 \neq 0$ . Which test do you use? And why?

Q6. The ANOVA table of one regression result of cargo air traffic is given below.

The critical value of  $F(6, 25) = 2.4904$  and  $\alpha = 5\%$ .

SOURCE	SS	Df	MSS
MODEL	2513370.09	6	
RESIDUAL			
TOTAL	2549152.88	31	

Compute (i) RSS (ii) Degree of freedom for RSS, (iii) Mean sum of squares, (ii) F and (iii) state the overall significance of the model.

## Section C

**Answer any two questions**

2 X 15 = 30

Q7. In the following multiple regression result, Air transport, passengers carried (ATP) is estimated using factors such as gross domestic savings (% of GDP) (gds); Industry, value added (constant 2010 US\$) (iva); and inflation, consumer prices (annual %) (icp).

Source	SS	df	MS			
Model	5.2156e+16	3	1.7385e+16	Number of obs = 18		
Residual	1.1445e+16	14	8.1752e+14	F( 3, 14) = 21.27		
				Prob > F = 0.0000		
				R-squared = 0.8200		
				Adj R-squared = 0.7815		
				Root MSE = 2.9e+07		
Total	6.3601e+16	17	3.7413e+15			
ap	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
gds	-934750	5112938	-0.18	0.858	-1.19e+07	1.00e+07
iva	.0002858	.0000551	5.19	0.000	.0001677	.0004039
icp	-3454707	8006250	-0.43	0.673	-2.06e+07	1.37e+07
_cons	-1.31e+08	2.27e+08	-0.58	0.573	-6.17e+08	3.55e+08

- (i) Interpret all the slope coefficients
- (ii) Interpret intercept, (iii) Interpret  $R^2$ , (iv) Test joint hypothesis.

Q8. Define and discuss Gauss-Markov theorem.

Q9. In the following multiple regression result, air transport, freight (af) is estimated using factors such as gross domestic savings (% of GDP) (gds); inflation, consumer prices (annual %) (icp); and gross capital formation (gcf).

Test individual and joint hypothesis of the following regression results with interpretation of all the coefficients.

Multiple Regression Results

Source	SS	df	MS	Number of obs = 18		
Model	448872382	3	149624127	F( 3, 14) = 45.95		
Residual	45590940.8	14	3256495.77	Prob > F = 0.0000		
Total	494463323	17	29086077.8	R-squared = 0.9078		
				Adj R-squared = 0.8880		
				Root MSE = 1804.6		
af	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
gds	-1752.01	249.0144	-7.04	0.000	-2286.093	-1217.928
icp	498.6813	534.3234	0.93	0.366	-647.3285	1644.691
gcf	8.84e-09	1.94e-09	4.56	0.000	4.68e-09	1.30e-08
_cons	38650.13	8028.947	4.81	0.000	21429.75	55870.5

### Section D

Answer any one question

1 X 30 = 30

Q10. Examine critically all 10 assumptions of classical linear regression model.

Q11. Describe methodology of econometrics with suitable example from aviation sector.