Given the following information (n=10):

SS total= 4490 **B^'** = [171 3.71 -1.13]

(X'y)'= [1916 43550 104736]

Calculate (a) **SS** regression and (b) error degrees of freedom

- (a) 3749.2 (b) 7 ✔
- (a) 741 (b) 7
- (a) 3749.2 (b) 8
- None
- (a) 370854.8 (b) 7

The correct answer is:
(a) 3749.2 (b) 7

An industrial engineers suspects that strength is related to the percentage of cotton in fiber. Three levels of cotton percentage are used, and five replicates were run in a random order resulting in the following data:

	Observations				
Cotton %	**1**	**2**	**3**	**4**	**5**
20	7	7	15	11	9
25	12	17	12	18	18
30	19	25	22	19	23

The estimate of T_3

- 8
- -2.6
- 6 ✔
- None
- 15.4

Given the following:

X'X =

20	**0**	**0**
0	20	0
0	0	20

x'y= (30 20 15)'

yy'=400

How many regressors in the model.

- 4
- 1
- 2 ✔
- None
- 3

The correct answer is:
2

Question 6

Consider the following computer output of ANOVA for CRD: (α= 0.05)

Source	df	SS	MS	F
Factor	5			
Error		27.38		
Total	29	66.34		

How many replicates did the experimenter use?

- None
- 5 ✔
- 4
- 24
- 6

The correct answer is:
5

Question 7

Correct

Given the following:

$(X'X) =$

20	**0**	**0**	**0**
0	20	0	0
0	0	20	0
0	0	0	20

The estimate of error standard deviation is 3, what is the estimate of the variance of B1 will be ----------

- None
- 0.45 ✔
- 0.15
- 0.6708
- 0.3873

The correct answer is:
0.45

Given the following results for **simple** linear regression:

predictor	Coef	SE Coef	T
Constant	12.86	1.032	
x		0.115	

R^2 = 98.1%

Source	DF	SS	MSE	F
Regression		a		c
Residual		b		
Total	9	930		

Calculate the missing values of a, b, c, d.

- a= 912.33 b= 10.767 c=41.305
- a= 912.33 b= 17.67 c=413.05 ✔

An industrial engineers suspects that strength is related to the percentage of cotton in fiber. Three levels of cotton percentage are used, and five replicates were run in a random order resulting in the following data:

	Observations				
Cotton %	**1**	**2**	**3**	**4**	**5**
20	7	7	15	11	9
25	12	17	12	18	18
30	19	25	22	19	23

The estimate of y_{22}

- 0.854
- 15.4 ✔
- -2.6
- None
- 6

Given the following results for multiple linear regression α=0.05:

predictor	Coef	SE Coef	T
Constant	254	4.78	
x1	2.77	0.185	
x2	-3.58	0.153	

R^2 adjusted =

Source	DF	SS	MS
Regression	b	22784	
Error			c
Total	14	23091	

The values of **b, c and d** are

- b=2 c=2.55833 d= 44.52899
- b=3 c=25.5833 d= 445.2899
- None
- b=53.13808 c=25.5833 d= 445.2899
- b=2 c=25.5833 d= 445.2899 ✔

A manufacturer of television sets is interested in the effect on tube conductivity of four different types of coating for color picture tubes. A completely randomized experiment is conducted and the following conductivity data are obtained:

Coating Type	Conductivity			
	1	2	3	4
1	40	41	50	46
2	52	49	37	43
3	34	26	32	27
4	29	27	32	29

The 95 percent confidence interval estimate of the

2	52	49	37	43
3	34	26	32	27
4	29	27	32	29

The 95 percent confidence interval estimate of the mean of coating type 4.

- (4.2281, 34.2719)
- (-24.2281, -34.2719)
- None
- (24.2281, 34.2719) ✔
- (24.2281, 4.2719)

The correct answer is: (24.2281, 34.2719)

Please select the right answer:

- None
- completely randomized block design means both the allocation of the experimental material and the order in which the individual runs of the experiment are to be performed are randomly determined.
- Randomization means both the allocation of the experimental material and the order in which the individual runs of the experiment are to be performed are randomly determined. ✔
- replication means both the allocation of the experimental material and the order in which the individual runs of the

experiment are to be performed are randomly determined.

- replication means both the allocation of the experimental material and the order in which the individual runs of the experiment are to be performed are randomly determined.
- blocking means both the allocation of the experimental material and the order in which the individual runs of the experiment are to be performed are randomly determined.

The correct answer is: Randomization means both the allocation of the experimental material and the order in which the individual runs of the experiment are to be

An industrial engineers suspects that strength is related to the percentage of cotton in fiber. Three levels of cotton percentage are used, and five replicates were run in a random order resulting in the following data:

	Observations				
Cotton %	**1**	**2**	**3**	**4**	**5**
20	7	7	15	11	9
25	12	17	12	18	18
30	19	25	22	19	23

The estimate of e34 and standardized error d24 are -

- None
- e34 = -1.6
- e34 = -2.6 ✔
- e34 = -1.6
- e34 = 2.6

Given the following:

$(X'X) =$

20	**0**	**0**	**0**
0	20	0	0
0	0	20	0
0	0	0	20

(a) How many degree of freedom for regression and (b) sample size

- ◉ 3 and 20 ✔
- ○ 3 and 10
- ○ None
- ○ 2 and 20
- ○ 2 and 4

The correct answer is:
3 and 20

Question **15**

Incorrect

A manufacturer of television sets is interested in the effect on tube conductivity of four different types of coating for color picture tubes. A completely randomized experiment is conducted and the following conductivity data are obtained:

Coating Type	Conductivity			
	1	2	3	4
1	40	41	50	46
2	52	49	37	43
3	34	26	32	27
4	29	27	32	29

Is there a difference in conductivity due to coating

Is there a difference in conductivity due to coating type? Use α=0.05.

- F reference = 14.63 is greater than F value = 3.49029 there are insignificant differences in the treatment means
- F reference = 14.63 is greater than F value = 3.49029 there are significant differences in the treatment variances
- None
- F reference = 14.63 is greater than F value = 3.49029 there are significant differences in the treatment means ✖

Given the following:

X'X =

20	**0**	**0**
0	20	0
0	0	20

x'y= (30 20 15)'

yy'=400

The number of degrees of freedom for error term is ---

- (•) 17 ✔
- ( ) 18
- ( ) None
- ( ) 7
- ( ) 8

The correct answer is:
17

Question 17

None

F reference = 14.63 is greater than F value = 3.49029 there are significant differences in the treatment means

F0 = 14.63 is greater than F reference = 3.49029 there are significant differences in the treatment means

The correct answer is:

F0 = 14.63 is greater than F reference = 3.49029 there are significant differences in the treatment means

Flag question

Given the following information from simple regression analysis:

Total sum of squares = 173.38 B1^=14.947

Sxy=10.17744 n= 20

The values of Sxx and se (B1^) are ----------

- Sxx=0.68088 and se(B^1)=1.317 ✔
- Sxx=6.8088 and se(B^1)=2.317
- Sxx=680.88 and se(B^1)=0.317
- Sxx=6.8088 and se(B^1)=1.317
- None

The correct answer is:

Mark 2.00 out of 2.00

Flag question

Consider the following computer output of ANOVA for CRD: (α= 0.05)

Source	df	SS	MS	F
Factor	5			
Error		27.38		
Total	29	66.34		

The F reference will be ---------- .

- F0.05,4,29
- None
- F0.05,5,24 ✔
- F0.025,5,24
- F0.05,4,24

The correct answer is: F0.05,5,24

Given the following data that related viscosity of a polymer (y) with two process factors x_1 and x_2.

x1	x2	y	x1	x2	y
93	11	379	80	8	256
93	9	340	99	8	368
94	12	364	81	8	250
115	10	426	96	10	409
82	12	293	97	13	440
90	11	330	95	11	364

The values of a11, a21 and a31 in the matrix X'y are ---- --------

- None
- a11 = 4219 a21 = 397485 a31 = 43809
- 397485
- 4219 ✖

93	11	379	80	8	256
93	9	340	99	8	368
94	12	364	81	8	250
115	10	426	96	10	409
82	12	293	97	13	440
90	11	330	95	11	364

The values of a11, a21 and a31 in the matrix X'y are ---- --------

- None
- a11 = 4219 a21 = 397485 a31 = 43809
- 397485
- 4219 ✖
- a31 = 4219 a21= 397485 a11 = 43809

Given the following:

X'X =

20	**0**	**0**
0	20	0
0	0	20

x'y= (30 20 15)'

yy'=400

The estimates of the intercept and regression coefficients are ----------

- B1=1.5 B2= 1 B3= 0.85
- B0=1.5 B1= 1 B2= 0.85 ✖
- None
- B0=0.5 B1= 1 B2= 0.85 B3= 2
- B0=1 B1= 2 B2= 0.85

Given the following data that related viscosity of a polymer (y) with two process factors x_1 and x_2.

x1	x2	y	x1	x2	y
93	11	379	80	8	256
93	9	340	99	8	368
94	12	364	81	8	250
115	10	426	96	10	409
82	12	293	97	13	440
90	11	330	95	11	364

The estimate of B1 and its standard error are ---------- ----------

- B1= 5.130 se(B1)= 0.842 ✔
- None
- B1= 12.84 se(B1)= 0.742
- B1= 12.84 se(B1)= 0.0842
- B1= 5.130 se(B1)= 1.842

Consider the following computer output of ANOVA for CRD: (α= 0.05)

Source	df	SS	MS	F
Factor	5	a		b
Error	c	27.38	d	
Total	29	66.34		

Fill in the values of **b and d** .

- b=6.830095 d= 1.140833 ✔
- b=38.96 d= 1.140833
- b=38.96 d=6.830095
- b= 24, d= 1.140833
- None

The correct answer is:
b=6.830095 d= 1.140833

Given the following results for multiple linear regression α=0.05:

predictor	Coef	SE Coef	T
Constant	254	4.78	
x1	2.77	0.185	
x2	-3.58	0.153	

Test the significance of the contribution of X2 to the model using the calculated and reference T values

- None
- T statistic= -23.3987 ✖
  t0.025/2,12=2.179
  significant effect
- T statistic= 23.3987
  t0.025/2,12=2.179
  significant effect

- None
- T statistic= -23.3987 ✖
  t0.025/2,12=2.179
  significant effect
- T statistic= 23.3987
  t0.025/2,12=2.179
  significant effect
- T statistic= -23.3987
  -t0.025/2,12=-2.179
  significant effect
- T statistic= -23.3987
  t0.025/2,12=2.179
  insignificant effect

The correct answer is:

T statistic= -23.3987 -
t0.025/2,12=-2.179
significant effect