KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS & STATISTICS
DHAHRAN, SAUDI ARABIA

STAT 212: BUSINESS STATISTICS II

Semester 163
Final Exam
Monday Aug 21, 2017
A

Name: ID#: Section#: Serial #:

Note: Use $\alpha = 0.05$ unless it is mentions in the question

1	a	**b**	c	d	e
2	**a**	b	c	d	e
3	a	b	c	d	**e**
4	a	b	**c**	d	e
5	**a**	b	c	d	e
6	a	**b**	c	d	e
7	a	b	**c**	d	e
8	a	b	c	d	**e**
9	a	b	c	**d**	e
10	**a**	b	c	d	e
11	**a**	b	c	d	e
12	**a**	b	c	d	e
13	a	b	c	**d**	e
14	a	**b**	c	d	e
15	**a**	b	c	d	e
16	a	**b**	c	d	e
17	a	b	**c**	d	e
18	a	**b**	c	d	e
19	a	b	c	**d**	e
20	**a**	b	c	d	e
21	a	b	**c**	d	e
22	a	b	c	d	**e**
23	**a**	b	c	d	e
24	a	b	c	d	**e**
25	a	**b**	c	d	e

26	a	**b**	c	d	e
27	a	b	**c**	d	e
28	a	b	c	**d**	e
29	**a**	b	c	d	e
30	a	b	c	d	**e**
31	a	b	**c**	d	e
32	a	b	c	**d**	e
33	a	b	**c**	d	e
34	a	b	c	d	**e**
35	a	**b**	c	d	e
36	a	b	c	d	**e**
37	**a**	b	c	d	e
38	a	**b**	c	d	e
39	a	b	**c**	d	e
40	a	b	c	**d**	e
41	a	b	c	d	**e**
42	a	b	**c**	d	e
43	**a**	b	c	d	e
44	a	b	c	d	**e**
45	a	**b**	c	d	e
46	a	b	c	**d**	e
47	a	b	c	d	**e**
48	a	b	**c**	d	e
49	**a**	b	c	d	e
50	a	b	c	**d**	e

With My Best Wishes

The state insurance commissioner believes that the mean automobile insurance claim filed in his state exceeds $1,700. To test this claim, the agency has selected a random sample of 20 claims and found a sample mean equal to $1,733 and a sample standard deviation equal to $400. They plan to conduct the test using a 0.05 significance level. Use these information to answer questions 1 & 2

1. The appropriate null and alternative hypotheses are
   a. $H_0: \bar{X} \leq \$1700$ vs. $H_1: \bar{X} > \$1700$
   b. $H_0: \mu \leq \$1700$ vs. $H_1: \mu > \$1700$
   c. $H_0: \mu \leq \$1733$ vs. $H_1: \mu > \$1733$
   d. $H_0: \mu \geq \$1700$ vs. $H_1: \mu < \$1700$
   e. None of the choices

2. Suppose that H_0 was rejected in the previous question, and that μ = $1,750 , then which one of the following statements is TRUE:
   a. No error has been committed
   b. Type I error has been committed
   c. Type II error has been committed
   d. H_0 shouldn't be rejected
   e. None of the choices

Two suppliers manufacture a plastic gear used in a laser printer. The impact strength of these gears measured in foot-pounds is an important characteristic. A random sample of n_1 =10 gears from supplier 1 results in $\bar{x}_1$= 290 and s_1= 12, while another random sample of n_2 =16 gears from the second supplier results in $\bar{x}_2$= 321 and s_2= 22. We want to test the claim that the mean impact strength of gears from supplier 2 is at least 25 foot-pounds higher than that of supplier 1. Use these information to answer questions 3 & 4:

3. The null and alternative hypotheses are :
   a. $H_0: \mu_2 - \mu_1 \leq 25$ vs. $H_1: \mu_2 - \mu_1 > 25$
   b. $H_0: \mu_2 - \mu_1 \geq 0$ vs. $H_1: \mu_2 - \mu_1 < 0$
   c. $H_0: \mu_1 - \mu_2 = 0$ vs. $H_1: \mu_1 - \mu_2 \neq 0$
   d. $H_0: \mu_1 - \mu_2 \leq 25$ vs. $H_1: \mu_1 - \mu_2 > 25$
   e. None of the choices

4. The test statistic value for testing the null hypothesis equals to:
   a. 0.7883
   b. 0.8979
   c. –4.0729
   d. –7.3575
   e. None of the choices

5. An accounting firm has been hired by a large computer company to determine whether the proportion of accounts receivables with errors in one division (Division 1) is different from that of the second division (Division 2). The managers believe that such a difference may exist because of the lax standards employed by the first division. To conduct the test, the accounting firm has selected random samples of accounts from each division with the following results:

	Division 1	Division 2
Sample size	n_1 = 100	n_2 = 100
Errors found	x_1 = 13	x_2 = 8

If the test statistic for the testing the null hypothesis is approximately 1.15 then the *p*-value equals:

a. 0.2502
b. 0.1251
c. 0.8749
d. 1.7498
e. None of the choices

6. The sugar content of the syrup in canned peaches is normally distributed. A random sample of 10 cans yields a standard deviation of 4.8 mg. Suppose it is claimed that the variance is more than 18 mg^2. Based on the sample information, the test statistic and the decision are:
a. Test Statistic = 11.52, and reject H_0
b. Test Statistic = 11.52, and don't reject H_0
c. Test Statistic = 12.80, and don't reject H_0
d. Test Statistic = 2.4, and don't reject H_0
e. None of the choices

Two chemical companies can supply a raw material. The concentration of a particular element in this material is important. The mean concentration for both suppliers is the same, but we suspect that the variability in concentration may differ between the two companies. The standard deviation of concentration in a random sample of (n_1=10) batches produced by company I is 4.7 g/l, while for company II, a random sample of (n_2=16) batches yields a standard deviation of 5.8 g/l.
Given these information, answer questions 7 &8

7. To see whether there is a sufficient evidence to conclude that the two population variances differ, the test statistic and the critical value are:
a. None of the choices
b. Test Statistic = 1.2340, Critical Value = 2.588
c. Test Statistic = 1.5229, Critical Value = 3.0061
d. Test Statistic = 2.588, Critical Value = 1.5229
e. Test Statistic = 1.2340, Critical Value = 2.494

8. The assumption(s) needed to perform the test in the previous question is(are):
a. The two population variances are independent
b. The two populations are normally distributed
c. The two samples variances are independent
d. Both (a) and (b)
e. None of the choices

The following table classifies an individual in 2 ways: gender and education.

Gender	No College	2-year College	4-year College	Total
Male	**7**	**13**	**30**	50
Female	**13**	**17**	**20**	50
Total	20	30	50	100

Use this table to answer questions 9 & 10

9. Based on these data, which of the following is the correct test statistic for testing whether the years of college is independent of gender?

a. Just over 12.5
b. Approximately 5.9919
c. Exactly 4.5
d. Approximately 4.3333
e. None of the choices

10. Referring to these data, which of the following conclusions should be reached if the appropriate hypothesis is conducted?

a. The gender and the level of education are not related
b. The gender and the level of education are related
c. There is a relationship between the gender and the level of education
d. Can't be determined without knowing the significance level
e. None of the choices

11. The point estimate of the variance of the error term in a regression model is

a. MSE
b. SSE
c. SSR
d. MSR
e. None of the choices

12. What measures the strength of the linear relationship between the dependent and the independent variable?

a. Simple correlation coefficient
b. Coefficient of determination
c. Y – intercept
d. Normal plot
e. None of the choices

13. For the same set of observations on a specified dependent variable, two different independent variables were used to develop two simple linear regression models. The results are summarized as follows:

Model I: $R^2 = 0.92$ and $S = 1.65$
Model II: $R^2 = 0.85$ and $S = 1.91$

a. A prediction based on Model II is likely better than a prediction based on Model I
b. The SSE for Model II is smaller than the SSE for Model I
c. The explained variation for Model II is larger than that for Model I
d. A prediction based on Model I is likely better than a prediction based on Model II
e. None of the choices

The XKT Energy Company is attempting to predict the fuel usage based on temperature. A random sample of size 8 of fuel usage (in thousands of gallons) and average daily temperature (Fahrenheit) is used to determine a simple regression equation. The simple regression results are provided in the following partial MINITAB regression output summary.

```
Predictor      Coef           SE Coef    T          P
Constant       15.8379        0.8018     19.75      0.000
Temperat       -0.002419      0.01746    -7.33      0.000
S = 0.6542          R-Sq = 89.9%        R-Sq(adj) = 88.3%
```

Use these information to answer the questions from 14 to 17

14. If the average temperature on a given day is 114 Fahrenheit's, the estimated fuel usage (in thousands of gallons) is:

a. 15,564.553 gallons
b. 15,562.134 gallons
c. 15,559.714 gallons
d. 15,837.9 gallons
e. None of the choices

15. The upper limit for a 95% confidence interval for the true regression slope is

a. 0.0403038
b. –0.0451419
c. –0.0403038
d. 0.0451419
e. None of the choices

16. The correlation between fuel usage and average daily temperature is equal to

a. 0.948156
b. –0.948156
c. 0.808201
d. –0. 808201
e. None of the choices

17. To test that the average daily temperature is significant or not, the *p*–value = 0 which means that:

a. Reject the null hypothesis $\beta_0 = 0$
b. Don't reject the null hypothesis $\beta_0 = 0$
c. Reject the null hypothesis $\beta_1 = 0$
d. Don't reject the null hypothesis $\beta_1 = 0$
e. None of the choices

18. In a multiple regression problem that contains two independent variables (X1 and X2), we have determined that $b_1 = 5$ and $b_2 = -1.2$. Therefore, we can state that:

a. If X1 is allow to vary, then for each unit increase in X1, the expected decrease in the dependent variable Y is 5
b. If X2 is held constant, then for each unit increase in X1, the expected increase in the dependent variable Y is 5
c. If X1 is held constant, for each unit increase in X2, the expected increase in the dependent variable Y is 1.2
d. The expected value of Y is equal to 5 when X1 is equal to zero
e. None of the choices

19. After running a multiple regression model with two predictors, we obtained the following results: $n = 12$, $SST = 82.55$, standard error of the estimate = 1.5561.
Based on the results given above, we can conclude that _____ percent of the variation in the response variable is explained by the variation in the two predictors.

a. 42.3
b. 58.2
c. 26.4
d. 73.6
e. None of the choices

20. _____ variables typically have values of one or zero and they are used to model the effects of different levels of _____ variables.

a. Dummy, qualitative
b. None of the choices
c. Random, qualitative
d. Qualitative, normal
e. Quantitative, discrete

21. A multiple regression problem contains two independent variables and 12 observations. We also know that $b_1 = 5$ and $b_2 = -1.2$. The degrees of freedom for regression and the degrees of freedom for error are ____ and _____, respectively.

a. 3, 9
b. 2, 11
c. 2, 9
d. 2, 10
e. None of the choices

22. If we increase the number of independent variables in a multiple regression model, the value of R^2 will

a. Never increase
b. Always decrease
c. Sometime decrease
d. Always increases
e. None of the choices

A marketing research firm is attempting to develop a model that it can use to help predict the average weekly sales for the medicines in the pharmacies. The marketing department has collected additional data on five variables from a random sample of 20 pharmacies. The variables are as follows:

Y: The average weekly prescription sales over the past year ($1000)
X1: The floor space in square feet
X2: The percentage of the floor space allocated to the prescription department
X3: The number of the parking spaces available to the store
X4: The weekly per capita income for the surrounding community ($100)
X5: The location of the pharmacy $= \begin{cases} 1, & \text{if it islocated in shopping center} \\ 0, & \text{otherwise} \end{cases}$

Use the following MINITAB output to answer the questions from 23 to 25

Correlations: y, x1, x2, x3, x4, x5

	Y	x1	x2	x3	x4
X1	0.183				
	0.440				
X2	-0.663	-0.751			
	0.001	0.000			
x3	-0.069	0.504	-0.328		
	0.772	0.023	0.158		
x4	0.385	0.863	-0.845	0.393	
	0.094	0.000	0.000	0.087	
X5	-0.203	0.710	-0.341	0.482	0.645
	0.392	0.000	0.141	0.031	0.002

Cell Contents: Pearson correlation
P-Value

Best Subsets Regression: y versus x1, x2, x3, x4, x5

Response is y

			Mallows		x	x	x	x	x
Vars	R-Sq	R-Sq(adj)	Cp	S	1	2	3	4	5
1	43.9	40.8	10.2	4.8351		X			
1	14.8	10.1	23.8	5.9604				X	
1	4.1	0.0	28.8	6.3234					X
1	3.4	0.0	29.1	6.3482	X				
2	66.6	62.6	1.6	3.8420	X	X			
2	64.7	60.6	2.5	3.9474		X			X
2	54.7	49.4	7.1	4.4697		X		X	
2	53.1	47.6	7.9	4.5484		X	X		
3	69.1	63.3	2.4	3.8089	X	X			X
3	67.9	61.9	3.0	3.8778	X	X	X		
3	66.6	60.4	3.6	3.9558	X	X		X	
3	66.3	59.9	3.7	3.9784		X	X		X
4	69.9	61.8	4.1	3.8825	X	X	X		X
4	69.3	61.1	4.3	3.9176	X	X		X	X
4	68.1	59.5	4.9	3.9978	X	X	X	X	
4	66.3	57.3	5.7	4.1063		X	X	X	X
5	70.0	59.3	6.0	4.0099	X	X	X	X	X

Regression Analysis: y versus x1, x2, x3, x4, x5

The regression equation is

$$y = 42.1 - 0.00242\,x1 - 0.500\,x2 - 0.0369\,x3 + 0.107\,x4 - 3.10\,x5$$

```
Predictor       Coef    SE Coef      T       P
Constant       42.09      10.44   4.03   0.001
x1          -0.002419   0.001839  -1.32   0.210
x2            -0.5005     0.1643  -3.05   0.009
x3           -0.03690    0.06547  -0.56   0.582
x4             0.1067     0.4274   0.25   0.807
x5             -3.100      3.250  -0.95   0.356

S = 4.00990    R-Sq = 70.0%    R-Sq(adj) = 59.3%

Analysis of Variance

Source           DF      SS      MS     F      P
Regression        5  525.44  105.09
Residual Error   14  225.11   16.08
Total            19  750.55
```

23. If you are going to fit a regression model using the forward selection method, what is the first predictor to be used?

a. X2
b. X1
c. X3
d. X4
e. None of the choices

24. Based on the Best Subset Regression, what is the best model to be selected?

a. { X1, X2, X4, X5}
b. { X1, X2}
c. { X1, X2, X3}
d. { X1, X2, X3, X5}
e. None of the choices

25. The portion of the total variation in the average weekly sold that is explained by the variation in the explanatory variables accounted for the given number of predictors and the sample size is

a. 70.0%
b. 59.3%
c. 63.3%
d. 62.2%
e. None of the choices

To test the overall model, at 5% level of significance, use the above MINITAB output to answer the questions from 26 to 28

26. The critical value is:

a. 2.958
b. 2.74
c. 3.663
d. 3.333
e. None of the choices

27. The test statistic is

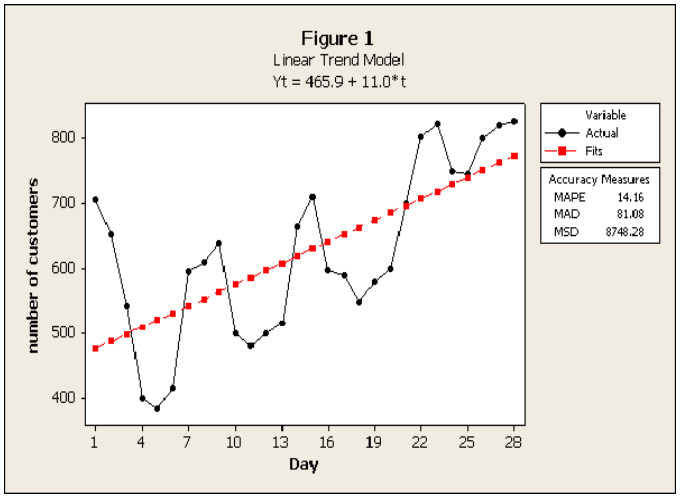
a. –3.05
b. –1.32
c. 6.54
d. 0.25
e. None of the choices

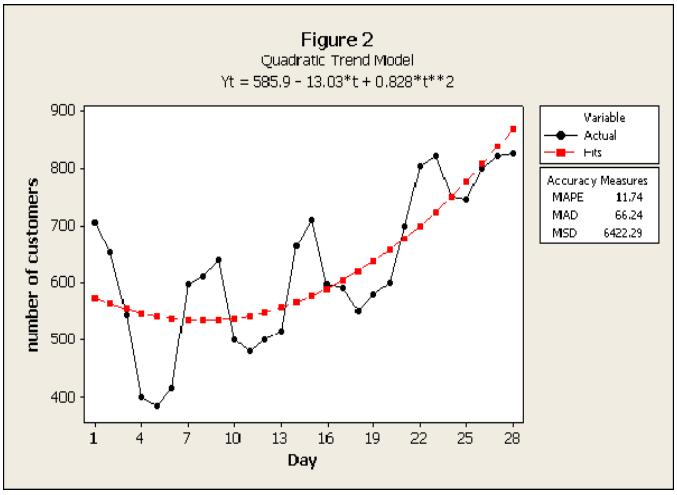
28. The conclusion is

a. The overall model is not significant
b. Since there is no *p*–value, we cannot make a decision
c. Since most of the *p*–values are greater than the level of significance, reject the null hypothesis
d. The overall model is significant
e. None of the choices

A restaurant manager wishes to improve customer service and the employee scheduling based on the daily levels of customers in the past 4 weeks. The numbers of customers served in the restaurant are collected for the past 4 weeks. (NOTE: the first day of the week is Sunday)

Use the MINITAB output below to answer the questions from 29 to 35





Time Series Decomposition for number of customers

```
Multiplicative Model

Data       number of customers
Length     28
NMissing   0


Fitted Trend Equation
Yt = 446.2 + 12.5*t
```

```
Seasonal Indices
Period    Index
     1    1.17058
     2    1.09632
     3    0.95682
     4    0.86971
     5    0.86809
     6    0.89930
     7    1.13918

Accuracy Measures
MAPE       9.21
MAD       58.14
MSD     5154.88
```

29. Which of the two models is more suitable?

a. The quadratic trend model
b. The linear trend model
c. Both of them are same
d. Cannot be determined
e. None of the choices

30. Predict number of customers to be served Monday next week using the linear trend model

a. 806.9
b. 771.9
c. 784.9
d. 817.9
e. None of the choices

31. Predict number of customers to be served Saturday next week using the quadratic trend model

a. 940.2
b. 837.702
c. 870.212
d. 904.378
e. None of the choices

32. Which of the following statements is TRUE?

a. The seasonal Index for Mon, Tue, Wed and Thu are less than 1 which means the number of customers served during these days has increased
b. The seasonal Index just for Sat, Sun are greater than 1 which mean the number of customers served during these days has increased
c. The seasonal Index for Mon, Tue, Wed, Thu and Fri are less than 1 which means the number of customers served during these days has increased
d. The seasonal Index for Sat, Sun and Mon are greater than 1 which mean the number of customers served during these days has increased
e. None of the choices

33. The seasonal Index for Sunday means that:

a. The number of customers served is 1.7058% above the average for the week
b. The number of customers served only 17.058% of the average for the week
c. The number of customers served is 17.058% above the average for the week
d. The number of customers served is 0.17058% of the average for the week
e. None of the choices

34. The seasonally unadjusted forecast for number of served in Monday next week is given by

a. 808.7
b. 846.2
c. 812.2
d. 823.7
e. None of the choices

35. The seasonally adjusted forecast for number of served in Monday next week is given by

a. 773.7803
b. 797.7008
c. 785.7405
d. 809.6610
e. None of the choices

The following table represents the expenses of a university for eleven years (in millions of S.R.)

Year	Salaries	Lab Materials	Housing	Maintenance
1999	2.00	0.15	0.5	0.75
2000	2.15	0.16	0.45	0.60
2001	2.30	0.20	0.55	0.80
2002	2.25	0.19	0.47	0.65
2003	2.45	0.17	0.48	0.95
2004	2.60	0.22	0.51	0.85
2005	2.70	0.18	0.49	1.05
2006	2.55	0.21	0.56	0.90
2007	2.50	0.23	0.60	1.00
2008	2.85	0.24	0.54	1.15
2009	2.90	0.25	0.63	1.20

Use the above table to answer the questions from 36 to 43

36. The simple price index number for Housing expenses of 2000 based on 1999 is
a. 87.91%
b. 111.11%
c. 94.07%
d. 106.3%
e. None of the choices

37. The unweighted aggregate price index number of 2001 based on 2000 is:
a. 114.58%
b. 87.26%
c. 113.24%
d. 88.31%
e. None of the choices

38. If 2001 is the base year, then Laspyres index number of 1999 is:
a. 113.95%
b. 87.76%
c. 110.42%
d. 90.56%
e. None of the choices

39. The third moving average of Lab Material with length of five years is:
a. 2.15
b. 2.33
c. 2.46
d. 2.71
e. None of the choices

40. If $w = 0.3$, then the third exponentially smoothed value of Maintenance is:
a. 0.705
b. 0.7085
c. 0.781
d. 0.7335
e. None of the choices

If you decided to forecast the Salaries using the model: $\widehat{Salaries} = b_0 + b_1 t^2$, where *t* is the coded time period then answer the questions that follow:

41. The unadjusted average Salaries at 1999 is:
a. 2.1948
b. 0.0072
c. 0.0061
d. None of the choices
e. 0.2262

42. The absolute error in estimating the Salaries in 2005 is:
a. 2.7777
b. 2.4844
c. 0.2156
d. 1.9022
e. None of the choices

43. The forecasted Salaries at 2010 is:

a. 2.3051
b. 2.298
c. 2.3123
d. 2.4271
e. None of the choices

The manager of a health club has recorded average attendance in newly introduced step classes over 15 months (October/2015 – December/2016):

Month	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
Attendance	32.1	39.5	40.3	46	65.2	73.1	83.7	106.8	118	133.1	163.3	182.8	205.6	249.1	263.5

She then obtained the following partial output of four autoregressive models:

AR(1)

```
HCAttnd = 5.67 + 1.10 Lag1


Predictor      Coef  SE Coef      T      P    VIF
Constant      5.671    4.747   1.19  0.255
Lag1        1.09879  0.03701  29.69  0.000  1.000


S = 9.16149   R-Sq = 98.7%   R-Sq(adj) = 98.5%
```

AR(2)

```
HCAttnd = 5.88 + 0.370 Lag1 + 0.850 Lag2


Predictor     Coef  SE Coef     T      P     VIF
Constant     5.885    4.705  1.25  0.240
Lag1        0.3702   0.3397  1.09  0.301  91.991
Lag2        0.8501   0.3954  2.15  0.057  91.991


S = 8.28926   R-Sq = 99.0%   R-Sq(adj) = 98.8%
```

AR(3)

```
HCAttnd = 10.8 + 0.071 Lag1 + 0.248 Lag2 + 1.06 Lag3

Predictor    Coef  SE Coef     T      P      VIF
Constant   10.802    3.884  2.78  0.024
Lag1       0.0712   0.2693  0.26  0.798   96.735
Lag2       0.2481   0.3445  0.72  0.492  116.160
Lag3       1.0555   0.3518  3.00  0.017   95.929

S = 6.02711   R-Sq = 99.5%   R-Sq(adj) = 99.3%
```

AR(4)

```
HCAttnd = 13.7 + 0.123 Lag1 + 0.303 Lag2 + 1.20 Lag3 - 0.344 Lag4

Predictor     Coef  SE Coef      T      P      VIF
Constant    13.661    3.916   3.49  0.013
Lag1        0.1229   0.3859   0.32  0.761  353.247
Lag2        0.3032   0.2583   1.17  0.285  118.941
Lag3        1.1969   0.2616   4.57  0.004   96.566
Lag4       -0.3435   0.4813  -0.71  0.502  251.639

S = 4.16349   R-Sq = 99.8%   R-Sq(adj) = 99.6%
```

Use the above information to answer the questions from 44 to 47

44. Using a 5% level of significance, what is the best AR model for the health club Attendance?

a. AR(2)
b. None of the choices
c. AR(3)
d. AR(4)
e. AR(1)

45. Using the first-order model, the forecast of average attendance for January/2017 is

a. 22.1529
b. 295.2022
c. 23.2516
d. 56.2153
e. None of the choices

46. Using the third-order model, the forecast of average attendance for August/2016 is
a. 224.5889
b. 284.7924
c. 365.3667
d. 188.169
e. None of the choices

47. The fourth-order model is
a. Not significant with a statistic value of – 0.3435
b. Significant with a p-value of 0.502
c. Not significant with a critical value of – 0.71
d. Significant with an R^2_{adj} of 99.6%
e. None of the choices

To study whether gasoline prices become higher during the height of the summer vacation season than at other times, the mean monthly prices (in dollars per gallon) were recorded in the US from January 2006 to April 2010. An exponential trend forecasting model was developed as follows:

$$\log(\widehat{GasPrice}) = 0.886 - 0.00001\,t - 0.048\,M1 - 0.021\,M2 + 0.003\,M3 + 0.078\,M4 + 0.153\,M5 + 0.234\,M6 + 0.246\,M7 + 0.226\,M8 + 0.194\,M9 + 0.140\,M10 + 0.067\,M11$$

where, $\widehat{GasPrice}$ is the estimated monthly gasoline prices.
$M1$ is a dummy variable for January
$M2$ is a dummy variable for February
$M3$ is a dummy variable for March …
and so on.

Use the above equation to answer the questions from 48 to 50

48. The best interpretation of the constant 0.886 in the regression equation is:
a. The fitted price for January of 2006, prior to seasonal adjustment, is $\log_{10}(0.886)$
b. The fitted price for January of 2006, after to seasonal adjustment, is 7.691
c. The fitted price for January of 2006, prior to seasonal adjustment, is 7.691
d. The fitted price for January of 2006, after to seasonal adjustment, is $\log_{10}(0.886)$
e. None of the choices

49. The best interpretation of –0.00001 the coefficient of *t* in the regression equation is:
a. The monthly compound decay rate in gas prices is around 0.0023%
b. The monthly compound growth rate in revenues is around $10^{-0.00001}$%
c. The monthly compound growth rate in revenues is around 0.0023%
d. The monthly compound decay rate in revenues is around $10^{-0.00001}$%
e. None of the choices

50. The best interpretation of 0.246 the coefficient of *M*7 in the regression equation is:
a. The average gasoline prices in July is approximately 76.19% lower than it was during December
b. The average gasoline prices in July is approximately 17.62% higher than it was during December
c. The average gasoline prices in July is approximately 17.62% higher than it was during December
d. The average gasoline prices in July is approximately 76.19% higher than it was during December
e. None of the choices