

KARACHI UNIVERSITY BUSINESS SCHOOL
University of Karachi
FINAL EXAMINATION JUNE 2010; AFFILIATED COLLEGES
BUSINESS MATHEMATICS BA (M) – 531
MBA – I

Date: July 7, 2010

Max Marks: 60
Max Time: 3 Hrs

Q.1. (a) Using Gaussian method, find A^{-1} if

$$A = \begin{bmatrix} -5 & 4 & -3 \\ 10 & -7 & 6 \\ 8 & -6 & 5 \end{bmatrix}$$

(b) Solve the system

$$2x_1 - x_2 + 3x_3 = 3$$

$$3x_1 + x_2 - 5x_3 = 0$$

$$4x_1 - x_2 + x_3 = 3$$

Q.2. (a) Solve $8x^2 \ln x - 6x \ln x = 9 \ln x$

(b) A sum of Rs. 1,000, 000/= is invested with the interest rate 10% per year. What will be amount after 10 years if interest is calculated.

- (i) Compound annually
- (ii) Compound semi annually
- (iii) Compound quarterly
- (iv) Compounded continuously

(c) A person's goal is to collect 1.2 million Rs., after 10 years on the interest rate 12% per annum calculated semi annually, what amount should be deposit to achieve his goal

Q.3. (a) Using limit approach determine $f'(x)$ if $f(x) = 3x^4 - x^3$

(b) Find $f'(2)$ and $f''(2)$ if $f(x) = \frac{e^{3x}}{(x^2 - 1)}$

Q.4. (a) Determine domain of $f(x) = \frac{\sqrt{8x^2 - 6x - 9}}{6x^2 + x - 12}$

(b) Find critical point if function of $f(x) = 2x^3 + \frac{5}{2}x^2 - 6x + 20$, determine their nature and find maximum and minimum values of the function.

Q.5. (a) Integrate (i) $\int x\sqrt{x+5} dx$ (ii) $\int (\ln x)^3 dx$

(b) Using partial fraction integrate $\int \frac{x^3 - x^2 + 2x - 3}{(x+1)(x+2)} dx$

NAME: MUHAMMAD ATEEQ

KARACHI UNIVERSITY BUSINESS SCHOOL

University of Karachi

FINAL EXAMINATION, DECEMBER 2009; AFFILIATED COLLEGES

BUSINESS MATHEMATICS BA (M)-531

MBA - I

Date: January 14, 2010

Max Marks: 60

Max Time: 3 Hrs

N.B. Attempt any 5 questions, all carry equal marks.

Q.1. (a) Find equation of line which divide the line passes through $(-3, 7)$ and $(2, 6)$ perpendicularly in 2 equal parts.

(b) Solve graphically $\begin{cases} 2x + 3y = -1 \\ 4x - y = 5 \end{cases}$ and check your answer algebraically.

Q.2. (a) Find inverse of $\begin{bmatrix} 1 & 1 & -1 \\ 2 & 0 & 3 \\ 0 & -1 & 2 \end{bmatrix}$

(b) Find AB if $A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -1 & 2 \\ 2 & 1 & 3 \end{bmatrix}$ $B = \begin{bmatrix} -1 & 0 \\ 2 & -2 \\ 1 & 1 \end{bmatrix}$

Q.3. A corporate agricultural organization has 3 separate farms which are to be used during the coming year. Following table indicates the crop selected for each farm, the annual cost of planting one acre of the crop, the expected revenue and fixed cost operating each farm. In addition annual fixed cost 75000/ for org. in whole.

Farm	Crops	Cost/acre	Rev/acre	Fixed cost
1	Soybeans	900	1300	150,000
2	Corn	1100	1650	175,000
3	Potatoes	750	1200	125,000

(i) Determine total cost function

(ii) Determine total revenue function

(iii) Determine total profit function

(iv) Determine expected total profit if 1000 acre of farm 1, 1600 of farm 2 and 1500 of farm 3 are planted.

(v) Somehow revenue is reduced 20,30,10% resp. at 3 farms, determine now the total profit from previously mentioned planting program.

Q.4. If an investment of Rs 2,00,000/ is made at interest rate of 12% per annum. Determine total amount after 6 years if interest is (i) Simple (ii) Compound (iii) compound calculated monthly (iv) compounded continuously (v) when amount become 3times if interest is compounded continuously.

Q.5. (a) Find $f'(1), f''(1)$ if $f(x) = x^4 e^{3x}$

(b) Determine the value of x for which $f(x) = 2x^3 - \frac{5x^2}{2} + x - 7$, is

(i) an increasing function

(ii) a decreasing function

Q.6. Integrate the following

(i) $\int (x^3 - 3x)(x^2 - 1) dx$

(ii) $\int x e^{2x} dx$

(iii) $\int x \sqrt{x+6} dx$

Paper Done - 4.5/50 Attended

KARACHI UNIVERSITY BUSINESS SCHOOL
 UNIVERSITY OF KARACHI
 FINAL EXAMINATION: AFFILIATED COLLEGES
 BUSINESS MATHEMATICS: BA(M)-531
 MBA-I

Instructions:

1. Attempt any FIVE questions in sequence preferably. All questions carry equal marks. Graph papers and financial tables of any kind shall not be provided.

Date: July 02, 2009 Time: 3 Hours Max Marks: 50

Q-1.(a) Pakistan is the sixth most populous country in the world. The Population as on January 01, 2006 was estimated as 163,985,373. Assuming the population is growing at an exponential rate of 2% per year, what will the population be on Jan 01, 2009? *5. Pe it*

(b) The number of mobile phones sold by a firm was three times the combined sale of CD players and Tape recorders. If the sales included 100 mobile phone sets and 20 Tape recorders, how many CD players were sold. *280*

(c) Given $A = \begin{pmatrix} 5 & 3 & 2 & 6 \\ 1 & 2 & 1 & 8 \\ 4 & 5 & 4 & 3 \end{pmatrix}$, $B = \begin{pmatrix} 2 & 1 & 8 \\ 5 & 4 & 3 \end{pmatrix}$

Find AB and BA. *AB not possible, BA = $\begin{pmatrix} 41 & 13 \\ 13 & 41 \end{pmatrix}$*

(d) A departmental store discounts sale price of its three items by 25%. If V_1 is the sale value of stock in its 3 branches before the discount, find the value V_2 after the discount, when

2.5 $V_1 = \begin{pmatrix} 60,000 & 55,000 & 80,000 \\ 150,000 & 130,000 & 95,000 \\ 65,000 & 90,000 & 100,000 \end{pmatrix}$ $V_2 = V_1 - 0.25V_1$
 $V_2 = 0.75V_1$

Q.2.(a) Consider the Linear Equation $3x - 6y = 24$, and determine the following:

- (i) What is the slope of any line parallel to the given line? *1/2*
 (ii) What is the slope of any line perpendicular to the given line? *-2*
 (iii) Find the equation of a line parallel to x-axis and which passes through (2, 5) *m=0, y=5*

Q.2.(b) A publisher has a fixed cost of Rs.250,000 associated with the production of a particular university book. The contribution to profit and fixed cost from the sale of each book is Rs.6.25. Determine the number of books which must be sold in order to break-even also determine what is the expected profit if 50,000 books are sold. *40000, 312500, 50000*

Q.3. (a) The City Government of Karachi is planning to purchase new CNG buses. The budget allocated for this purpose is Pak.Rs.60 Million. Two types of buses are to be purchased, one costing Rs.400,000 each and the other Rs.500,000 each. If x equals the number of type 1 buses and y the number of type 2 buses. (i) Determine the linear equation which states that the total amount spent on this purchase equals Rs 60 million. (ii) Rewrite the equation in slope-intercept form. (iii) Interpret the meaning of slope and Y-intercept. *y=70, 81, 480*

Q.3. (b) Determine the ultimate direction for the function:

(i) $f(x) = x^2 - x^7 + x^2 - 1000y^{-1000}$ (ii) $f(x) = -(x^3 - 2)^4$ $y = -16$

Evaluate the following:

- (i) $2e^{0.4} \rightarrow 2.983649$ (ii) $\ln e^3 \rightarrow e^{3x}$ (iii) $\ln(1/10) \rightarrow -e^{10}$
 (iv) If $x = 9.3001 \times 10^{-9}$ find $\log x$ (v) $\ln(x+1) - \ln x = 0.5$
 $\rightarrow 4.6849 \times 10^{-10}$ $\rightarrow -0.5906$

Q.4. Sketch the quadratic function $f(x) = 3x^2 + 6x - 45$.

Q.5. For a particular prescription drug half of the amount of the drug in the bloodstream is excreted by the kidneys every 4 hrs. Given an initial dosage of 300mg (i) Determine the function $A=f(t)$ where A equals the amount of the drug in the bloodstream (in mg) and t equals time since the dosage was administered measured in increment of 4 hours. (ii) What amount is in the system after 8 hours, after 10 hours *300(0.5)^{t/4}*

Q.6.(a) Determine $f'(x)$ for the following:

- (i) $f(x) = (x^2 - 5)(x - x^3)$
 (ii) $f(x) = \ln(5x^2 - 2x + 1)$
 (iii) $f(x) = \frac{e^x}{x}$

Q.6.(b) Integrate the following:

- i. $\int x^{-1} dx$
 ii. $\int (x^2 - 2x)^5 (x-1) dx$
 iii. $\int 2xe^{x^2} dx$

KARACHI UNIVERSITY BUSINESS SCHOOL
UNIVERSITY OF KARACHI

FINAL EXAMINATION : AFFILIATED COLLEGES
BUSINESS MATHEMATICS : BA (M) - 531
MBA - I

Time ; 3 Hours
Date : January 24, 2008

Marks : 60

Instructions : Attempt all questions. All questions carry equal marks.

Q.No.1 (a). Differentiate (i) $y = \frac{e^{2x}}{(x^3 - 5x)}$ (ii) $y = (3x^2 - 5) \cdot \sqrt{4x^2 - 3x + 1}$

(b). Find $f'(2)$ and $f''(2)$ of $f(x) = x^2 \cdot e^{3x}$

Q.No.2 (a). Find equation of line passes through mid point of the points $A(-3, 5)$, $B(3, -1)$ and is perpendicular to the $2x - 3y = 18$. Also draw graph of both lines.

(b). Determine domain of the function $f(x) = \frac{1}{x^2 - x - 6}$

Q.No.3 (a). Find solution graphically $2x - 3y = -13$
 $4x + 2y = -2$

(b). Find inverse of the matrix $\begin{bmatrix} 1 & 2 & 0 \\ 1 & 0 & -1 \\ -1 & 3 & 2 \end{bmatrix}$ by any method.

Q.No.4 (a). Integrate $\int (3x - 10)^3 dx$

(b). Integrate $\int \frac{x^3 - 1}{x^4 - 4x} dx$

Q.No.5 { An investment of Rs. 250,000/- is made at the interest rate 10% per year. Determine the amount after 5 year if interest is

- (i) Simple
- (ii) Compound
- (iii) Compound Calculated after every month
- (iv) Compounded continuously
- (v) When the amount become double if compounded continuously.

Q.No.6 (a). Solve $X^2 \ln X - 4X \ln X = -3 \ln X$

(b). A gas station sells unleaded regular gasoline and unleaded premium, the price per gallon charged by the station is 1.399 for regular and 1.479 for premium. The cost per gallon from supplier is 1.319 for regular and 1.389 for premium. If x_1 , and x_2 are number of gallon sold for regular and premium respectively.

- (i) Determine profit function.
- (ii) What is total profit expected if the station sells 100,000 and 40,000 gallons of regular and premium respectively.
- (iii) What is the total profit on same sells if revenue decrease 2% and 5% respectively.

University of Karachi
Department of Business Administration
MBA (First Year First Semester) BA(M)-531
Final Examination: Affiliated Colleges
BUSINESS MATHEMATICS

Instructions:

1. **Attempt any six questions in sequence/ all questions carry equal marks.**
2. **Exchange of stationary items/calculators/Digital diary/ Mobile Phone is strictly prohibited.**

Dated: Jan 25, 2008

Time: 180 Minutes

Max. Marks: 60



Q-1. (a). Solve the following equations/inequalities.

(i) $x^2 - 2x - 15 > 0$

(ii) $x^2 - 2x + 5 = 0$

(iii) $|x| = -5$

(iv) $|x - 4| > 6$

(b). Given the points $(-4, 8)$ and $(6, -12)$

- i. Determine the midpoint of the line segment connecting the points.
- ii. Determine the distance separating the two points.

(c). Given two points $(3, 18)$ and $(5, -14)$

- i. Determine the equation of straight line, which passes through the two points.
- ii. Identify the slope, y intercept, and x intercept and also interpret it.

(d). Determine the equation of straight line, which is perpendicular to the line $3x - 2y = -28$ and which passes through the point $(-5, 20)$

Q.2. The book value of a machine is expressed by the equation $V = 60,000 - 7500t$
Where V equals the book value in Rupees and t equals the age of the machine expressed in years

- (a) Identify the t and V intercepts.
- (b) Interpret the meaning of the intercepts.
- (c) Interpret the meaning of the slope.
- (d) Sketch the function.
- (e) Determine the restricted domain and range for this function

Q.3. The upper management of a company is confronted with a decision between two alternatives. Consider the following case.

A company produces a high-pressure oil valve to be used in the chemical industry using a special type of machine. The company's fixed cost on the valve is \$ 20,000 per month. The variable cost of production per valve is \$900. The Company is considering replacing the old machine with a new one. The new machine costs \$ 1,200,000. Assuming a 10 yr straight-line depreciation period, the monthly depreciation cost of the new machine will be \$10,000. Other fixed cost allocated to this product is \$18,000. However because this machine will result in less scrappage and wastage of raw materials and will require less operator time to produce a valve, it will reduce the variable cost of the valve to \$ 500 per valve. Above what volume of production will the new machine be better then the old machine. State your decision.

Q.4. a) Determine discontinuity (if any) for the functions given below:

(i) $f(x) = x^9 - x^7 + x^2 - 1000$ (ii) $f(x) = (x^3 - 2)/(x + 2)$

b) Solve the equation

(i) $\ln(x^2 + 2) - \ln x^2 = 2$

(ii) $x^2 - 36 = 0$

(iii) If $f(x) = e^{x-2}$, compute $f(0)$, $f(3)$
If $f(x) = \ln x$, compute $f(1)$, $f(4)$

c) Convert the following to base "e" exponential function:

(i) $f(x) = (2)^x$ (ii) $f(t) = 10(0.3)^t$

Q.5. For a particular prescription drug half of the amount of the drug in the bloodstream is excreted by the kidneys every 4 hrs. Given an initial dosage of 300mg
(a) Determine the function $A=f(t)$ where A equals the amount of the drug in the bloodstream (in mg) and t equals time since the dosage was administered measured in increment of 4 hours.

(b) What amount is in the system after 8 hrs, after 10hrs

Q.6.(a) A radioactive substance has a decay constant $k=0.350$. If t is measured in hrs, determine the half-life for the substance. What is the quarter life (time to reduce the amount by $\frac{1}{4}$)?

Q.6.(b) Find all higher order derivatives

(i) $f(x) = x^6 - 2x^5 + x^4 - 3x^3 + x^2 - x + 1$

(ii) $f(x) = 2506$

(iii) $f(x) = -14x^3 - 5x + 100$

(iv) $f(p) = p^2 + 6p$

(v) $f(x) = e^{-x}$

Q.7 (a) Find the indefinite integral (if possible)

i. $\int 20 dx$

ii. $\int dx/6$

iii. $\int 15x dx$

iv. $\int (42x + 15) dx$

v. $\int (x^2 - x + 1) dx$

(b) Determine the inverse of the Matrix

$$A = \begin{bmatrix} 2 & -4 & 6 \\ 6 & 1 & 5 \\ 1 & -2 & 3 \end{bmatrix}$$

University of Karachi
 Department of Business Administration
 MBA (First Year First Semester)
 Final Examination: Affiliated Colleges
BUSINESS MATHEMATICS BA(M)-531

Instructions:

1. Attempt all questions in sequence/ all questions carry equal marks.
2. Exchange of stationary items/calculators & use of Mobile Phone is strictly prohibited.

Dated: June 26, 2006 Time: 3 Hours Max. Marks: 60

Q.1.

- a. The equation $4x + 8 = \frac{8x + 16}{2}$ is a _____ type of equation.
- b. Is the statement $y = x + 9$, a valid statement.
- c. The degree of the polynomial $x^4 + 2x + 9 = 0$ is _____.
- d. Equation of x - axis is _____.
- e. Equation of y - axis is _____.
- f. The x & y intercepts for the eq. $(x+y)/2 = 3x - 2y + 16$ are _____ and _____.
- g. The slope of a vertical line is _____.
- h. Illustrate a negative slope and describe its co-ordinate relationship.
- i. $(a,b) = \{x | a < x < b\}$ is _____ interval [open, closed, half open]
- j. Is the statement true $\left| \frac{-120}{5} \right| = \left| \frac{120}{5} \right| = 24$
- k. Determine the solution set for the inequality (also illustrate using number line)
 $x^2 - 5x + 6 \leq 0$
- l. A triangle has co-ordinates of its vertex as follows: (0,0), (2,0), (0,6)
 Find the length of the maximum side.
- m. Classify the following functions by type:
 (i) $(x+2) / \sqrt{x^2 + 4x + 4}$ (ii) $2^a / 2^x$ (iii) 3^{2x} (iv) $\sqrt{x^2/x}$ (v) $Y = F(x) = 38$

Q.2 (a) Solve the following system of equation by elimination procedure also interpret your result.

$$\begin{aligned} 6x - 12y &= 24 \\ -1.5x + 3y &= 9 \end{aligned}$$

Q.2 (b) The value of a machine is expected to decrease at a linear rate overtime. Two data points indicate that the value of the machine at $t=0$ is Rs.18,000 and its value in one year will be Rs.14,500.

- (i) Determine the slope intercept equation $[Y = f(t)]$
- (ii) Interpret the meaning of the intercepts and the slope.

Q.3. (a)

The function $q = f(p) = 180,000 - 30p$ is a demand function which expresses the quantity demanded of a product q as a function of the price charged for the product p, stated in rupees. Determine the restricted domain and range for this function

Q.3 (b)

A blending process is to combine three components in such a way as to create a final blend of 60,000 gallons. The three components cost Rs. 2.00, Rs1.50, and Rs. 1.25 per gallon, respectively. Total cost of the components should equal Rs.90,000. Another requirement in the blending is that the number of gallons used of component 1 should be twice the amount used of component 3. Determine whether there is a combination of the three components which will lead to a final blend of 60,000 gallons costing Rs.90,000 and satisfying the blending restrictions.

Q.3 (c) Given $c=h(s)=s^2-8s+5$ and $s=f(t)=10$, determine (a) $h(f(t))$ (b) $h(f(3))$ (c) $h(f(-2))$

Q.4. Market surveys of suppliers of a particular product have resulted in the conclusion that the supply function is approximately quadratic in form. Suppliers were asked what quantities they would be willing to supply at different market prices. Results of the survey indicated that at market prices of Rs. 25, Rs.30, and Rs. 40 the quantities which suppliers would be willing to offer to the market were 112.5, 250.0, and 600.0 (thousand) units, respectively. Determine the equation of the quadratic supply function $[q = f(p)]$ also sketch the function.

Q.5 (a) The resale value V of a piece of industrial equipment has been found to behave according to the function $V = 250,000e^{-0.05t}$ Where t = years since original purchase.

- (a) What was the original value of the piece of equipment?
- (b) What is the expected resale value after 5 years?
- (c) How long does it take for the resale value of the asset to reach 25 percent of its original value?

Q.5. (b) Solve the following:

- i) $3e^{-0.5x} = 10$
- ii) $5 + 2^{(x+2)} = 261$
- iii) $x^2 \ln x - 9 \ln x = 0$

Q.5. (c) A Garment Store discounts sale price of its three items by 25%. If V_1 is the sale value of stock in its 3 branches before the discount, find the value V_2 after the discount, when

$$V_1 = \begin{pmatrix} 60,000 & 55,000 & 80,000 \\ 150,000 & 130,000 & 95,000 \\ 65,000 & 90,000 & 100,000 \end{pmatrix}$$

Q.6. (a). Evaluate the limit $\lim_{x \rightarrow \infty} (4x^4/-7x^4)$

Q.6. (b) Find $f'(x)$ & determine values for which $f'(x) = 0$
 $f(x) = \frac{(10-x)}{(x^2+2)}$

Q.6. (c) Find $f'(x)$ for $f(x) = \frac{(3x)}{x^2}$

i. $\int 1/x dx$

ii. $\int dx/\sqrt{x}$

iii. $\int \sqrt{x} dx$

iv. $\int (x^2 - 2x + 1) dx$

**KARACHI UNIVERSITY BUSINESS SCHOOL
UNIVERSITY OF KARACHI**

**FINAL EXAMINATION, JUNE-JULY, 2008 : AFFILIATED COLLEGES
BUSINESS MATHEMATICS : BA (M) - 531
MBA - I**

Time ; 3 Hours
Date : July 05, 2008

Marks : 60

Instructions : Attempt all questions. All questions carry equal marks.

Q.No.1. Discuss the continuity of the following function at $x = -1$ and $x = 1$. Also draw its graph on $[-3, 2]$.

$$f(x) = \begin{cases} 3x+5 & -3 \leq x < -1 \\ x-1 & -1 \leq x \leq 2 \end{cases}$$

Q.No.2 (a). Differentiate (i) $y = \frac{e^{2x}}{(x^2 - 5x)}$ (ii) $y = (3x - 5) \cdot \sqrt{6x^2 - 2x + 1}$

(b). Find 4th order derivatives of $f(x) = x^3 \cdot e^{2x}$

Q.No.3 (a). Find equation of line passes through mid point of the points $A(5, -3)$, $B(3, -1)$ and is perpendicular to the $3x - 2y = 18$. Also draw graph of both lines.

(b). Determine domain of the function $f(x) = \sqrt{x^2 - x - 6}$

Q.No.4 (a). Find solution graphically $3x + 2y = 8$
 $x - y = 1$

(b). Find inverse of the matrix $\begin{bmatrix} 1 & 0 & 3 \\ 2 & 4 & 1 \\ 1 & 3 & 0 \end{bmatrix}$ by any method.

Q.No.5 (a). Given $y = g(u) = u^2 - 3u + 2$ and $u = h(x) = x^2 + 1$, determine
(i) $g(h(x))$ (ii) $g(h(5))$

(b). A corporate agricultural organization has 3 separate farms which are to be used during coming year, table shows crop selected for each farm, variable and fixed costs and revenue are also given.

Farm	Crop	Var. Cost/acre	Fixed Cost	Rev./acre
1	Soybeans	900	150,000	1300
2	Corn	1100	175,000	1650
3	Potatoes	750	125,000	1200

Determine

(i) Profit Function

(ii) It is decided that 1000 acres, 1600 acres and 1550 acres of the farms 1, 2, 3 respectively will be planted, what will be profit

(iii) If unfortunately revenue reduces by 10%, 15%, 20% respectively at three farms, what will be profit now.

Q.No.6 (a). An investment of Rs. 500,000/- is made at the interest rate 9% per year. Determine the amount after 6 year if interest is

(i) Simple

(ii) Compound

(iii) Compound Calculated after every month

(iv) When the amount become double if compounded continuously.

Department of Business Administration
 MBA (First Year First Semester)
 Final Examination: Affiliated Colleges
BUSINESS MATHEMATICS BA(M)-531

Instructions:

1. Attempt all questions in sequence/ all questions carry equal marks.
2. Exchange of stationary items/calculators & use of Mobile Phone is strictly prohibited.

Dated: June 26, 2006 Time: 3 Hours Max. Marks: 60

Q.1.

- a. The equation $4x + 8 = \frac{8x + 16}{2}$ is a _____ type of equation.
- b. Is the statement $x = x + 9$, a valid statement.
- c. The degree of the polynomial $x^4 + 2x + 9 = 0$ is _____
- d. Equation of x - axis is _____
- e. Equation of y - axis is _____
- f. The x & y intercepts for the eq. $(x+y)/2 = 3x - 2y + 16$ are _____ and _____
- g. The slope of a vertical line is _____
- h. Illustrate a negative slope and describe its co-ordinate relationship
- i. $(a,b) = \{x | a < x < b\}$ is _____ interval [open, closed, half open]
- j. Is the statement true $\left| \frac{-120}{5} \right| = \left| \frac{120}{5} \right| = 24$
- k. Determine the solution set for the inequality (also illustrate using number line)
 $x^2 - 5x + 6 \leq 0$
- l. A triangle has co-ordinates of its vertex as follows: (0,0), (2,0), (0,6)
Find the length of the maximum side.
- m. Classify the following functions by type:
(i) $(x+2) / \sqrt{x^2 + 4x + 4}$ (ii) $2^n / 2^n$ (iii) 3^{2x} (iv) $\sqrt{x^2/x}$ (v) $Y = F(x) - 38$

Q.2 (a) Solve the following system of equation by elimination procedure also interpret your result.

$$\begin{aligned} 6x - 12y &= 24 \\ -1.5x + 3y &= 9 \end{aligned}$$

Q.2 (b) The value of a machine is expected to decrease at a linear rate overtime. Two data points indicate that the value of the machine at $t=0$ is Rs.18,000 and its value in one year will be Rs.14,500.

- (i) Determine the slope intercept equation $[V = f(t)]$
- (ii) Interpret the meaning of the intercepts and the slope.

Q.3. (a)

The function $q = f(p) = 180,000 - 30p$ is a demand function which expresses the quantity demanded of a product q as a function of the price charged for the product p, stated in rupees. Determine the restricted domain and range for this function

Q.3 (b)

A blending process is to combine three components in such a way as to create a final blend of 60,000 gallons. The three components cost Rs. 2.00, Rs.1.50, and Rs. 1.25 per gallon, respectively. Total cost of the components should equal Rs.90,000. Another requirement in the blending is that the number of gallons used of component 1 should be twice the amount used of component 3. Determine whether there is a combination of the three components which will lead to a final blend of 60,000 gallons costing Rs.90,000 and satisfying the blending restrictions.

Q#5

- (a) List the parts of a long (formal) report and briefly give the significance of each part. (6)
- (b) How is synopsis different from an executive summary? (3)
- (c) What is the impact of using visual aids in a formal report? (3)

Q#6

You have seen an advertisement of Pak Green Bank, Islamabad, inviting applications for probationary (Trainee) officers for their finance and management department. The required qualification is MBA with major in finance /management. Consider yourself a suitable candidate and draft a solicited job letter along with a resume. (12)

Q#7

- (a) You have to tell a local restaurant owner that your plans have changed and you are canceling the 50-person banquet scheduled for next month. Do you need to use a buffer? Why or why not? (6)
- (b) Why is it important to end your bad news message on a positive note? (3)
- (c) As a manager, how many of your daily tasks require persuasion? List any three and explain them. (3)

Q#8

- (a) Do as directed: (8)
- i. Your letter is not clear at all, I cannot understand it. (Make it polite)
 - ii. We do not refund if the returned item is soiled and un-saleable. (Give it a positive tone)
 - iii. Working as fast as possible, the budget was soon ready. (Remove the dangling modifier)
 - iv. Upon procurement of additional supplies, I will initiate fulfillment of your order. (Write it in plain English)
 - v. Crippled workers face many barriers on the job. (Remove disability bias from the sentence)
 - vi. She knows not only accounting, but she also reads Latin. (Rewrite using the parallel forms)
 - vii. Most respectfully I beg to state that I want to apply for the post of manager in your company. (Make it concise)
 - viii. I dropped the glass on a plate and it broke. (Make it clear)
- (b) Identify and correct the errors in the following sentences: (4)
- i. If I was you, I would help her.
 - ii. She is late from college for twenty minutes.
 - iii. She like to wear black glasses.
 - iv. Tears streamed from her checks.

x-----x

Q.3 (c) Given $c=h(s)=s^2-8s+5$ and $s=f(t)=10$, determine (a) $h(f(t))$ (b) $h(f(3))$ (c) $h(f(-2))$

Q.4. Market surveys of suppliers of a particular product have resulted in the conclusion that the supply function is approximately quadratic in form. Suppliers were asked what quantities they would be willing to supply at different market prices. Results of the survey indicated that at market prices of Rs. 25, Rs.30, and Rs. 40 the quantities which suppliers would be willing to offer to the market were 112.5, 250.0, and 600.0 (thousand) units, respectively. Determine the equation of the quadratic supply function $[q = f(p)]$ also sketch the function.

Q.5. (a) The resale value V of a piece of industrial equipment has been found to behave according to the function $= 250,000e^{-0.05t}$ Where t = years since original purchase.

- What was the original value of the piece of equipment?
- What is the expected resale value after 5 years?
- How long does it take for the resale value of the asset to reach 25 percent of its original value?

Q. 5. (b) Solve the following:

- $3e^{-0.5x} = 10$
- $5 + 2^{(x+2)} = 261$
- $x^2 \ln x - 9 \ln x = 0$

Q.5. (c) A Garment Store discounts sale price of its three items by 25%. If V_1 = the sale value of stock in its 3 branches before the discount, find the value V_2 after the discount, when

$$V_1 = \begin{bmatrix} 60,000 & 55,000 & 80,000 \\ 150,000 & 130,000 & 95,000 \\ 65,000 & 90,000 & 100,000 \end{bmatrix}$$

Q.6. (a) Evaluate the limit $\lim_{x \rightarrow \infty} (4x^4 - 7x^4)$

Q.6. (b) Find $f'(x)$ & determine values for which $f'(x) = 0$
 $f(x) = \frac{(10-x)}{(x^2+2)}$

Q.6. (c) Find $f'(x)$ for $f(x) = \left[\frac{(3x)}{(1-x^2)} \right]^5$

Q.6. (d) Find the indefinite integral for the following (Any Four).

- $\int -25 dx$
- $\int dx/\sqrt{x}$
- $\int \sqrt[5]{x^3} dx$
- $\int (x^2 - 2x)^5 (x-1) dx$
- $\int x^2 e^{3x^3} dx$