**DEPARTMENT OF BUSINESS ADMINISTRATION**

**QUESTION BANK FOR BBA**

**FUNDAMENTALS OF BUSINESS MATHEMATICS**

**MODULE 1 (CO-Explain Set Theory) (Create)**

**SECTION A**

1. If A = {x: x is a natural number and x < 3} then what is p (A)?
2. If A = {1,8,6,7} and B= {6,7,3,2} then What is B-A
3. If A = {1, 2, 3} B= {2, 4} evaluate A x B and B x A.
4. If A = {1, 4}, B = {2, 5} and C = {5, 7} determine (A x B) U (A x C).
5. If A={1,3,5,7,9} B={2,4,6} C={3,4,7}.Find Aᴒ(Bᴗ C)
6. Divide 36 in the ratio 5:1
7. List out the power set of the set A= {3, 8, 1}
8. Represent A∩B’ using venn diagram?
9. What you mean by union of two sets?
10. If A= {1, 2, 3} ,B={a, b} .verify A$×$B= B$×$A
11. Find all subsets of A={a, b, c}

**SECTION B**

1. If A={1,4,7,10} B={2,4,5,8} U={1,2,3,4,5,6,7,8,9,10} ,find A’ᴒB.
2. Define power set of a set with example
3. Illustrate union and intersection of sets with example
4. Explain complement and difference of two sets with example
5. If A = {2, 4}, B = {3, 5} and C = {1, 7} find (A x B) U (A x C).
6. If A={1,3,5,7} B={5,9,13,17} and C={1,3,9,13} ,Determine (A-B)-C, A-(A-B)
7. If A = {1, 4}, B = {2, 5} and C = {5, 7} find (A x B) U (A x C).
8. If A={1,3,5,7}, B={5,9,13,17}, C={1,3,9,13}.Evaluate A∩B ,BᴜA, A-B, B-A, A-C, (A-B)-C,

**SECTION C**

1. Verify Demorgan’s law for A={2,3} B={3,4} U={1,2,3,4,5}

 (ii)If A={a,b} B={p,q} C={q,r}.Verify A×(BᴜC)=(A×B)ᴜ(A×C).

1. (i)If A={2,3,4,6}, B={1,2,3,4,5,6,7}, C={1,3,4,6,7,8,9}.Find A∩B ,BᴜA, A-B, B-A, A-C, (A-B)-C,

 (ii)If A={1,2,3,4,5} B={3,4,5,6,7} and C={1,3,9,13} ,find (A-B)-C, A-(A-B)

1. Verify Demorgan’s law for A={3,5} B={2,3} U={1,2,3,4,5}

 (ii)If A={a,b,c} B={p,q,r} C={q,r,s}.Verify A×(BᴜC)=(A×B)ᴜ(A×C).

1. (i)Explain set operations with example

 (ii) Represent AUB’ using venn diagram?

**MODULE 2 (CO-Examine Number system,ratio and Proportion) (Analyse)**

**SECTION A**

1. Find the mean proportion to 3 and 12?
2. Compare the relationship between x and y if x varies as y and x=14 when y=2?
3. Find the fourth proportion to 3,5,9?
4. Divide 24 in the ratio 5:1?
5. If A varies directly as B and inversely as the square root of C and if A=6 when B=10 and C=25.Determine the value of A when B=C=100.
6. Divide 36 in the ratio 5:1
7. A man can complete a job in 18 days. How many days will it take for 9 men to complete the same job
8. The ratio of monthly incomes of A and B is 5:6. If the monthly income of A is Rs. 450.find the monthly income of B.
9. If a:b=2:3 and b:c =4:5 find a:b:c.
10. Find the compound ratio of 3:6 , 4:5
11. Find the fourth proportion to 3,5,9
12. If 5x=6y determine y: x
13. Define a rational number
14. Determine the compound ratio of 4:5, 8:9 and 15:16

**SECTION B**

1. The ratio of two numbers is 8:11 and their difference is 135. Find the numbers?
2. If $\frac{x+2y}{2x-y}=\frac{2}{3}$ show that x is proportional to y.
3. The monthly salaries of two persons are in the ratio 3:5.If each receives an increase of Rs.20 in the monthly salary the ratio is altered to 13:21.Compare their salaries
4. If x varies directly as y and inversely as z . Find the relation between x, y, z if x =15,y=8 and z=2. Also find x when y=6 and z=3.
5. Ages of two people are in the ratio 3:4. After 10 years their ages would be in the ratio 4:5. Find their ages?
6. If 5x-2y:3x+2y=4:7 find x:y?
7. Ages of two people are in the ratio 3:4.After 10 years their ages would be in the ratio 4:5.Evaluate their ages.
8. Divide Rs.540 among A,B,C in the ratio 6:5:7

**SECTION C**

1. (i)The monthly incomes of two persons are in the ratio 4:6 and their monthly expenditure are in the ratio 7:9.If each saves Rs. 50 per month. Find their monthly incomes.?

 (ii)A man completes a job in 12 days. How many days will it take for 6 men to complete the same job?

1. (i)If $\frac{x+2y}{2x-y}=\frac{2}{3}$ show that x is proportional to y.

 (ii)If 2x+3y: x-2y=4:3, Evaluate $x^{2}+y^{2}:x^{2}-y^{2}$

1. (i)Prove that $\sqrt{2}$ is irrational.

 (ii) If $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}$ show that each of these ratios equal to$\frac{2a-3c+5e}{2b-3d+5f}$

1. (i)Ages of two people are in the ratio 4:5. After 10 years their ages would be in the ratio 5:6.Determine their ages

 (ii) If 40 men can plough 240 acres in 36 days ,how long will 60 men take to plough 160 acres?

**MODULE 3 (CO-Determine Permutation and Combination) (Evaluate)**

**SECTION A**

 1.In how many different ways can a pack of 52 cards be dealt among 4 players, so that each receives exactly 13 cards

 2.In how many ways can 8 boys form a ring.

3.If x=log 2,y= log 3, z=log 5 ,find log 30.

 4.In how many ways can 4 white and 3 black balls be selected from a box containing 20 white and 15 black balls.

 5 Simplify $16 +32-8 $

1. If nP2= 72, find n?
2. . How many diagonals have a polygon of 5 sides?
3. . Find the number of years a sum of Rs.10000 will take to become 18000 if the rate of interest is 8%
4. Find the rate of interest per annum if the simple interest on a principal of Rs.5000 is 800 for 4 years?
5. In how many ways can 3 white and 5 black balls be selected from a box containing 14 white and 16 black balls

**SECTION B**

1. In how many ways can arrange the letters of the word ‘ASSASSINATION’
2. From 7 females & 6 males, a committee of 8 persons is to be formed. In how many ways can this be done when committee consist of exactly 4 males?
3. Find the C.I on Rs. 1000 at the rate of 10% per annum for 18 months when interest is compounded half yearly.
4. Find ½ log 9 + ¼ log 81 + 2 log 6 –log 12
5. Show that 3 log 4 + 2 log 5 – 1/3 log 64 – ½ log 16 =2.
6. In how many ways can 4 white and 3 black balls be selected from a box containing 20 white and 15 black balls.
7. A machine costs Rs. 10000 .Calculate its scrap value at the end of 10 years, depreciation on the reducing installment system being charged at 10%per annum.
8. Solve $4 $+$16 $+$64 $=12

**SECTION C**

1. .(i) A family of 4 brothers and 3 sisters is to be arranged for a photograph in one row . In how many ways can they be seated if (i)all the sisters sit together?(ii)no two sisters sit together

 (ii)A candidate is required to answer 5 out of 10 questions.(a) How many choices he has?(b)if he has to answer first two questions , how many choices he has?(c)if he has to answer at least 3 questions of first 5 questions, how many choices he has?

1. Find the total amount of annuity of Rs.2400 payable at the end of every quarter for 6 years at 10% compounded quarterly?
2. Show that $7\frac{16}{5}+5\frac{25}{24}+3\frac{81}{80}=1 $
3. (i) How many words can be formed out of the letters of the word TRIANGLE which will begin with T?

 (ii)Find the number of ways in which 6 boys and 4 girls may be arranged in a row if no two of the girls are to together?

**MODULE 4 (CO-Analyse Matrix) (Analyse)**

**SECTION A**

1. Define symmetric matrices. Show that $\left[2 -1 5 -1 6 2 5 2 0 \right]$ is symmetric.
2. Define singular and non-singular matrices.
3. Find the rank of $\left[5 2 1 0 1 3 2 1 0 \right]$
4. Show that I2 is idempotent.
5. Evaluate $\left|1 2 -3 2 -1 2 3 2 4 \right|$
6. Define the rank of a matrix. Find the rank of the matrix$\left[3 6 8 1 \right]$
7. Define skewsymmetric matrix with example?
8. Define singular matrix. Show that $\left[2 -1 5 4 -2 10 5 2 0 \right]$ is singular.
9. Define symmetric and non-symmetric matrices.
10. Find the determinant of $\left[5 2 1 0 1 3 2 1 0 \right]$

**SECTION B**

1. If A=$\left[1 2 3 2 3 4 -1 1 2 \right]$ and B=$\left[0 2 -1 1 3 4 0 -2 -3 \right]$ find the products AB and BA. Show that AB≠BA.
2. If A=$\left[1 2 3 2 0 1 1 -1 2 \right]$ B=$\left[1 0 5 2 -1 2 1 0 1 \right]$ , C=$\left[1 0 1 2 -1 1 1 -1 0 \right]$ find 4(A-B+C)
3. Find the rank of $\left[1 2 0 3 1 2 2 4 0 5 2 10 \right]$
4. If A= $\left[1 2 0 2 4 -1 4 3 \right]$ and B= $\left[2 1 0 1 -1 2 3 3 \right]$ , (i) Find X such that A-X=3B(ii) Find Y such that A+2Y=4B.
5. If A=$\left[2 1 3 1 3 1 1 -1 4 \right]$ B=$\left[2 0 3 4 -1 2 1 0 2 \right]$ , C=$\left[-1 0 3 2 -1 1 1 -1 0 \right]$ find 2(A+B+C)
6. If A=$\left[2 -2 1 1 0 4 -1 1 2 \right]$ and B=$\left[1 1 -1 1 -3 5 2 4 -3 \right]$ find BA
7. If A=$\left[3 2 -1 1 0 2 -1 1 0 \right]$ and B=$\left[1 1 -1 1 3 2 2 1 -3 \right]$ find AB
8. If A=$\left[2 2 2 1 0 3 -1 1 2 \right]$ and B=$\left[-1 1 -1 1 3 4 2 3 -3 \right]$ find BA

**SECTION C**

1. If A=$\left[2 -2 -3 1 1 2 -1 2 0 \right]$ and B=$\left[-1 -1 -1 1 3 2 -2 1 -3 \right]$ find AB and BA

1. If A=$\left[2 1 3 1 3 1 1 -1 4 \right]$ B=$\left[2 0 3 4 -1 2 1 0 2 \right]$ , C=$\left[-1 0 3 2 -1 1 1 -1 0 \right]$ ,Show that A(B+C)=AB+AC
2. If A=$\left[3 1 2 1 -1 1 1 -1 4 \right]$ B=$\left[3 0 1 4 -1 2 2 0 3 \right]$ , C=$\left[-1 0 -3 2 -1 1 2 -1 0 \right]$ ,Show that A(BC)=(AB)C
3. If $\left[2 1 2 1 -1 1 1 -1 4 \right]$ B=$\left[-3 0 1 4 -1 1 -2 0 3 \right]$ , C=$\left[--1 0 -3 2 -1 1 2 -1 0 \right]$ ,Show that A(BC)=(AB)C

**MODULE 5 (CO-Solve the system of linear equations using matrices) (Apply)**

**SECTION A**

1. Define minor and cofactor of a matrix
2. If A=$\left[3 2 1 1 4 3 1 3 5 \right]$, find adjoint of A
3. If A=$\left[1 4 2 4 \right]$ find A (adjA)
4. Write the matrix form of 2x-4y =7; 5x+2y=11
5. If A=$\left[3 4 1 2 1 2 1 5 3 \right]$, find adjoint of A
6. Find inverse of A if A=$\left[6 1 2 4 \right]$

1. Find inverse of A if A=$\left[3 2 5 4 \right]$
2. Write the matrix form of 2x+3y =1; 3x+y=5
3. If A=$\left[2 3 1 0 4 2 1 3 5 \right]$, find adjoint of A
4. If A=$\left[6 1 2 4 \right]$ find A$A^{-1}$

**SECTION B**

1. Find inverse of A where A=$\left[3 5 7 2 -3 1 1 1 2 \right]$.
2. . If A=$\left[2 3 4 5 7 9 -2 1 1 \right]$ , B=$\left[4 0 5 1 2 0 0 3 1 \right]$, find$(AB)^{t}$
3. If A=$\left[3 -3 0 6 3 9 12 3 24 \right]$ B=$\left[2 3 0 6 -9 3 3 3 -3 \right]$ verify that $(AB)^{t}$=$B^{t}A^{t}$
4. Solve the equations 2x-3y=3, 4x-y=11 using Cramer’s rule.
5. Find inverse of A where A=$\left[1 2 3 2 3 1 1 1 2 \right]$.
6. Apply Crammer’s rule to find the solution of the equations: 2x+3y =1; 3x+y=5
7. If A=$\left[1 2 0 0 3 0 1 1 4 \right]$ P.T AA-1=A-1A=I
8. If A=$\left[2 3 1 1 3 4 1 1 0 \right]$ P.T AA-1=A-1A=I

**SECTION C**

1. Solve the equations $x-3y+z+1=0, 2x+y-4z+1=0, 6x-7y+8z-7=0$ using matrix method.
2. Solve the equations $x+y-2z=2, 2x+6y-3z=-1, 3x+4y-2z=3 $ using Cramer’s rule.
3. Solve the equations 3x+y+z=8, x+ y +z=6, 2x+y-z=1 using matrix method.
4. 14. Solve the equations $x+y-2z=2, 2x+6y-3z=-1, 3x+4y-2z=3 $ using Cramer’s rule.