**Guess Paper – 2013  
Class – XII  
Mathematics**

Time -3 Hours Max. Marks-100

**GENERAL INSTRUCTIONS:**

1. All questions are compulsory.
2. The question paper consists of 29 questions divided in to three sections A, B and C, section A contains 10 questions of one mark each, section B contains 12 questions of 4 marks each and section C contains 7 questions of 6 marks each.
3. All the questions of section A are to answered in one word, one sentence or as per the exact requirement of the question.
4. There is no overall choice .However, internal choices have been provided in 4 questions of 4 marks each and in 2 questions of 6 marks each.
5. Use calculator is not permitted.

**SECTION-A**

1. Prove that the function f: N N, defined by f(x) = x3 +x2 +1 is one –one.
2. Find the principal value of
3. Find the point on the curve y =x2 -4x +5, where the tangent do not intersect X –axis at any point.
4. Let A be any non singular square matrix of order 3 with =p ( p is any integer ) then find the value of
5. If A and Bare two independent events, such that P ( A ) =0.3 , and P ( B ) =0.6 , find P ( not A and B )
6. Evaluate
7. Find the value of ,if the vector = + +, and = -2 + 3 are perpendicular
8. Evaluate
9. Find
10. If A = ,and B =, then find ( AB )-1

**SECTION-B**

1. Let f ; N N ,be defined as f ( n ) = , state whether the function is bijective.
2. Show that ++ =

OR

Prove that = , x (0, )

1. Differentiate +
2. Find the interval in which the function is given by f(x) = sinx + cosx , 0 x 2is strictly increasing and strictly decreasing .

OR

Prove that the curve x =y2 and x.y =K cut at right angle if 8 k2 =1.

1. Show that =abc (1+ + )
2. Evaluate

OR

Evaluate

1. Show that the general solution of the differential equation +, is given by (x+y+1) =A (1 –x-y-2xy), where A is a parameter.

OR

Show that the given differential equation is homogeneous and solve it (1 +) +( 1- ) =0

1. Solve the differential equation is (1 + ) + ( 1+) =0 given that x=0 and y=1.
2. Evaluate
3. If with reference the right handed system of mutually perpendicular unit vectors , and , =3 - , =2 -3 ,then express in the form of =+ ,where is parallel to and is perpendicular to
4. A box of oranges inspected by examining three randomly selected oranges drawn without replacement ,if all three oranges are good , the box is approved for sale, otherwise it is rejected .find the probability that a box contains 15 oranges out of which 12 are good and only 3 are bad ones will be approved for sale.
5. Find the equation of plane passing through the point P ( -1 , 3 , 2 ) , and perpendicular to each of the planes x +2y +3z =5 and 3x+ 3y +z =0

**SECTION-C**

1. Evaluate the integration as limit of sums
2. Solve the following system of equation using matrix method

X +2y +z =7, x +3z =11, 2x -3y =1

OR

Using elementary row transformation, find the inverse of matrix

1. Show that the semi vertical angle of the right circular cone of given surface area and maximum volume is
2. Find area lying above x- axis and included between the circle x2 +y2 =8x and the parabola y2 =4x.

OR

Find area of the region enclosed between two circles x2 +y2 =4 and (x-2)2 +y2=4.

1. Show that the lines = ( + - ) + (3- ), and = ( - ) + ( 2 +3), are coplanar .Also find the plane which contains these two lines.
2. There are two factories located one at place P and other at place Q .From these locations, a certain commodity is to be delivered to three depots situated at A, B, and C .The weekly requirement of the depots are 5, 5, and 4 units of commodity while the production capacities of the factories at P and Q are respectively 8 and 6 units. The cost of transportation per unit is given as

|  |  |  |  |
| --- | --- | --- | --- |
| From/To | Cost (in Rs.) | | |
| A | B | C |
| P | 160 | 100 | 150 |
| Q | 100 | 120 | 100 |

How many units should be transported from each factory to each depot in order that the transportation cost is minimum .what will be the minimum transportation cost?

1. Assuming that the chances of a patient having a heart attack is 40% .It is also assumed that a meditation and yoga reduce the risk of heart attack by 30% and prescription of certain drug reduce its chances by 25% .At a time patient can chose one of the two options with equal probabilies .It is given that after going through one of the two options the patient selected at random suffers a heart attack .Find the probability that the patient followed a course of meditation and yoga.

ANSWERS -1

|  |  |
| --- | --- |
|  | 1. **( 2 , 1 )** |
| 1. P2 | 1. 0.42 |
| 1. Tanx – cotx +c | 1. = |
| 1. a2+b2+c2+d2 | 1. x logx-x+c |
| 1. A-1 = | 1. No. |
| 1. cosx.logx] + [ cosx.cotx –sinx.logsinx ] | 1. Increase [ 0, ) ( , 2 ] ,decreasing ( |
| 1. x + -3 +c | 1. (OR) +c |
| 1. ( OR) y +x =c | 1. y = |
| 1. 5 -7 log +c | 1. =- , =+ -3 |
|  | 1. 7x -8y +3z +25 =0 |
|  | 1. X=2, y=1, z=3 |
| 1. ( OR ) A-1 = |  |
| 1. ( OR ) – 2 | 1. . ( 3 +9 -2 )=14 |
| 1. (0,5,3)units from P ,(5,0,1)units from to A,B, and C minimum cost =Rs 1550 |  |

TIPS:

* Always **Hope** for the best ……… …………..
* **YOU** are simply advised to attempt section **B** first then section **C** and in last section **A**.
* **However** you can also decide this order in first 15 minutes (reading time), that which section you should attempt first and why?
* **In** first hour you must try to attempt such questions which are easy to solve to you.

DEV ADVANCE SAMPLE PAPER -2

(Most expected questions for Board Exam -2011)

MATHEMATICS

Time -3 Hours CLASS -XII Max. Marks-100 **GENERAL INSTRUCTIONS:** Same as above dev advance -1

**SECTION-A**

1. Let be a binary operation on **N** given by a b =L.c.m of a and b. Is a commutative binary operation?
2. Find the value of )]
3. If A = and A +AT =I , then find the value of reflex ‘ ’
4. Find the value of x if =
5. Find the value of the determinants
6. Find a point on the curve y= ( x-2 )2 at which the tangent is parallel to x-axis .
7. Integrate the function
8. If a unit vector makes angles with , with and an acute angle with .find
9. Find ,if ( 2 +6+14 ) ( – +7 ) =
10. Find the distance between two planes 2x +3y +4z =4 and 4x +6y +8z =12

**SECTION-B**

1. If R1 and R2 are two equivalence relations, then show that their intersection is also an equivalence relation.
2. Prove that = ) , x [ 0,1 ]

OR

+, then show that - =

1. Use the product , to solve the following system of equations x – y +2z =1, 2y – 3z = 1 , 3x – 2y +4z =2.

OR

If A = , and I be the identity matrix of second order, then show that ( I – A ) =I + A

1. If f (X) =is continuous at x =0, find the values of a, b ,c.
2. Two numbers are selected at random (without replacement), from the first six positive integers. Let X denotes the larger of the two numbers obtained. Find expectation of x.
3. If x +y =0 , then prove that =

OR

If y = [logx +] 2, then show that (1+x2) +x -2 =0

1. Evaluate
2. Evaluate
3. Solve the differential equation =(1- x+ y – xy)

OR

Solve the differential equation +y cotx =2x +(x, given that y=0 at x=.

1. Solve the differential equation x cos ( =y cos (+x
2. Let ,and are three vectors such that =3 , =4 and =5, and each one of them is perpendicular to sum of other two, find
3. If a plane has the intercepts a ,b and c and it is at a ‘p’ unit distance from the origin then show that + =.

**SECTION-C**

1. If x , y and z are different and A = =0 ,then show that xyz = - 1

OR

Using the properties of determinants show that = (1- ) 2

1. A square piece of tin of side 18 cm is to be cut in to a box without top by cutting a square from each corner and folding up the flaps to form a box. What should be the side of square to cut off so that the volume of box is maximum?

OR

Show that the height of cylinder of greatest volume which can be inscribed in a right circular cone of height ‘h’ and semi-vertical angle is one third that of the cone and greatest volume of cone is h3

1. Evaluate the integration as limit of sums
2. Find the area of the region { ( x, y ) : x2+y2 2ax ,y2 , x }
3. Find the equation of the plane which contains the line of intersection of the planes .( + 2 ) - 4 =0, .( + ) + 5=0, and which is perpendicular to the plane .(5 + 3 ) + 8 =0,
4. A diet is to contain at least 80 units of vitamin A and 100 units of minerals. Two foods F1 and F2 are available, food F1 and F2 costs per unit are Rs 4 and Rs 6 respectively. Food F1 contains 3 units of vitamin A and 4 units of minerals and food F2 contains 6 units of vitamin A and 3 unit of minerals .Formulate it as L.P.P and find the minimum cost for diet that consists of mixture of two foods and also meet the minimal nutritional requirement.
5. A man is known to speak truth 3 out of 4 times. He throws a die and report that it is six. Find the probability that it is actually six.

ANSWERS-2

|  |  |
| --- | --- |
|  |  |
| 1. X = 6 | 1. Zero |
| 1. ( 2 ,0 ) | 1. + x +c |
|  | 1. = - 3 |
| 1. units | 1. X =0 , y =5 , z =3 |
| 1. a = ,b =R – {0} , c = |  |
|  | 1. +c |
| 1. log (1+y) = x - +c | 1. ( OR ) y =x2 - |
| 1. Sin( =log | 1. =5 |
| 1. Side of square = 3 cm. |  |
| 1. ( | 1. 33x + 45y +50z – 41 =0 |
| 1. Minimum cost = Rs. 104 |  |

DEV ADVANCE SAMPLE PAPER -3

(Most expectable questions for Board Exam -2011)

MATHEMATICS

Time -3 Hours CLASS -XII Max. Marks-100 **GENERAL INSTRUCTIONS:** Same as above dev advance -1

**SECTION-A**

1. If f(x) = x2 – 1 , g(x) =2x +5 , then find fog(x)
2. Evaluate integration of
3. Find the value of +2
4. What kind of angle does the slope of tangent to the curve y = 3x2 + 1makes in anticlockwise direction of x- axis at x = ?
5. Find a unit vector perpendicular to vectors =+and 2 - +
6. Find the determinant value of the matrix, which is the product of given matrix and its transpose.
7. Write the vector equation of normal to the given plane 2x – 3y +5z = 9.
8. Evaluate
9. Find the value of x ,such that =
10. Find k, if the matrix has no inverse.

**SECTION-B**

1. Show that the relation R defined in the set A of all triangles as R = { ( T1 , T2 ) : T1 is similar to T2) , is an equivalence relation .Consider the three right angled triangles T1 with sides 5 ,12 ,13 , T2 with 3 , 4 ,5 and T3 with sides 6 , 8, 10 .which triangles among T1 ,T2 and T3 are related.
2. If sin ( + ) = 1, then find the value of x.
3. Using properties of determinants ,show that =- ( a-b)(b-c)(c-a)(a2+b2+c2)

OR.

If = 0then solve for x

1. If y = [logx +] 2, then show that (1+x2) +x -2 =0

OR

If = ,then prove that =

1. If f (x) = , if f(x) is continuous on [0, 8 ] ,find a and b.
2. Evaluate

OR

Evaluate

1. Evaluate
2. Solve (1+x2) +2xy =cotx , ( x

OR

Find the equation of the curve passing through the origin, given that the slope of the tangent to the curve at any point (x, y) is equal to sum of co-ordinates of the point.

1. Solve the differential equation =
2. If ,and are three mutually perpendicular vectors of equal magnitude, Prove that the angle which ( + ) makes with any of three vectors ,and is
3. Show that the lines , and do not intersect.
4. Two cards are drawn successively with replacement from a well shuffled deck of 52 cards .Find the probability distribution of the number of aces.

**SECTION-C**

1. Find A -1 ,if A = ,Hence solve the system of linear equations ,y+2z+8=0 , x+2y +3z +14 =0, 3x+y+z +8=0

OR

Using the elementary transformation find inverse of

1. Evaluate, , as a limit of sums.
2. Show that the height of the cylinder of maximum volume that can be inscribed in a sphere of radius R is . Also find the maximum volume.

OR

Show that the semi-vertical angle of the cone of maximum volume and given slant height is.

1. Find the area of the region { (x,y) : y2  4x , 4x2 +4 y2 9 }
2. Find the length and foot of perpendicular from the point ( 7 ,14,5) to the plane 2x+4y –z =2
3. An aero plane can carry a maximum 200 passengers. A profit of Rs 1000 is made on each executive class and a profit of Rs 600 is made on each economy class ticket. The airlines reserve at least 20 seats for executive class, however at least 4 times as many passengers prefer to travel by economy class than by executive class. Determine how many tickets of each type must be sold in order to maximize the profit for the airline. Also find the maximum profit.
4. A doctor is visit a patient .From the past experience, it is known that the probability that he will come by train ,bus ,scooter or by other means of transport are respectively .The probabilities that he will be late are ,If he comes by train ,bus and scooter ,but if he comes by other means of transport ,then he will not be late. When he arrives, he is late .Find the probability that he comes by train.

ANSWERS-3

|  |  |
| --- | --- |
| 1. fog(x) =4x2+20x+24 |  |
|  | 1. Obtuse. |
|  | 1. 5 |
| 1. 2 |  |
| 1. X = | 1. K = |
| 1. T2 is similar to T3 | 1. x = |
| 1. (OR) x = | 1. A=3 , b = - 2 |
| 1. ( ) +c | 1. (OR) log (+c |
|  | 1. Y = (1+x)-2log +c (1+-1 |
| 1. (OR) x+y+1 = |  |
| |  |  |  |  | | --- | --- | --- | --- | | X | 0 | 1 | 2 | | P(x) |  |  |  | |  |
|  | 1. A-1 = ,x=- 1, y=- 2, z=- 3 |
| 1. (OR) A-1 = |  |
| 1. [ + - sq. unit | 1. Foot of = (1,2 ,8)   distance =3units |
|  | 1. 40tickets of executive class 160 of economy ,maxi profit =Rs 1,36,000 |

DEV ADVANCE SAMPLE PAPER -1