JEE ADVANCED MATHS SOLUTIONS

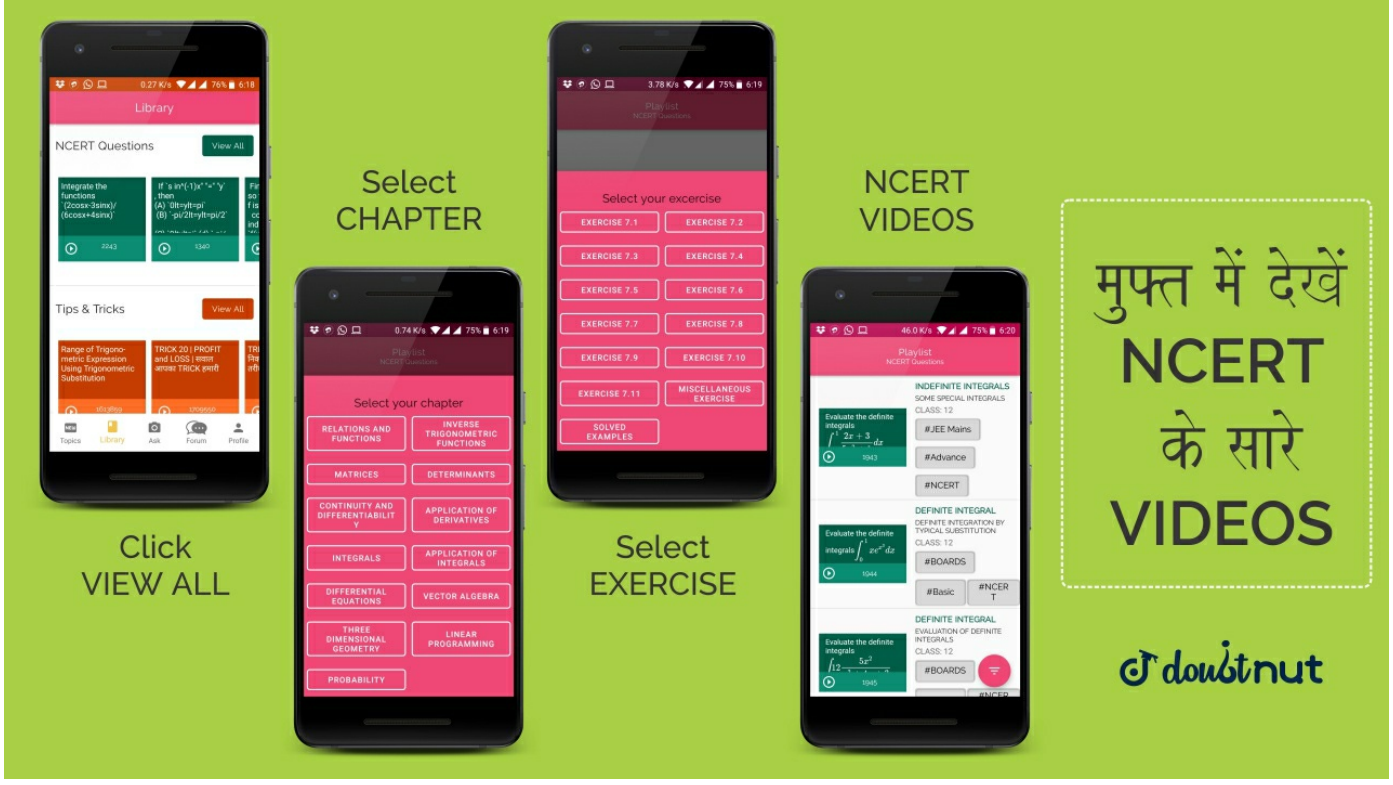
YEAR 2011

Ques No.	Question
1	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** Let `alpha` and `beta` be the roots of `x^2-6x-2=0` with `alpha>beta` if `a_n=alpha^n-beta^n` for ` n>=1` then the value of `(a_10 - 2a_8)/(2a_9)` Watch Free Video Solution on Doubtnut
2	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** A straight line L through the point (3,-2) is inclined at an angle `60^@` to the line `sqrt(3)x+y=1` If L also intersects the x-axis then the equation of L is Watch Free Video Solution on Doubtnut
3	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** Let `(x_0, y_0)` be the solution of the following equations In `(2x)^(ln2)=(3y)^(ln3)`and `3^(lnx)=2^(lny)` Then `x_0` is Watch Free Video Solution on Doubtnut

4	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** The value of `int_(sqrt(ln2))^(sqrt(ln3)) (xsinx^2)/(sinx^2+sin(ln6-x^2)) dx` is Watch Free Video Solution on Doubtnut
5	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** Let ` vec a= hat i+ hat j+ hat k , vec b= hat i- hat j+ hat ka n d vec c= hat i- hat j- hat k` be three vectors. A vector ` vec v` in the plane of ` vec aa n d vec b ,` whose projection on ` vec c` is `1/(sqrt(3))` is given by ` hat i-3 hat j+3 hat k` b. `-3 hat i-3 hat j+3 hat k` c. `3 hat i- hat j+3 hat k` d. ` hat i+3 hat j-3 hat k` Watch Free Video Solution on Doubtnut
6	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** Q. Let `P={theta:sin theta-cos theta=sqrt2 cos theta}` and `Q={theta:sin theta+cos theta=sqrt2 sin theta}` be two sets. then Watch Free Video Solution on Doubtnut
7	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** Let `Ma n dN` be two `3xx3` non singular skew-symmetric matrices such that `M N=N Mdot` If `P^T` denote the transpose of `P ,` then `M^2N^2(M^T N)^(-1)(M N^(-1))^T` is equal to `M^2` b. `-N^2` c. `-M^2` d. `M N` Watch Free Video Solution on Doubtnut

8	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** The vector(s) which is/are coplanar with vectors ` hat i+ hat j+2 hat ka n d hat i+2 hat j+ hat k ,` and perpendicular to vector ` hat i+ hat j+ hat k ,` is/are ` hat j- hat k` b. `- hat i+ hat j` c. ` hat i- hat j` d. `- hat j+ hat k` Watch Free Video Solution on Doubtnut
9	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** let the eccentricity of the hyperbola `x^2/a^2-y^2/b^2=1` be reciprocal to that of the ellipse `x^2+4y^2=4.` if the hyperbola passes through a focus of the ellipse then: Watch Free Video Solution on Doubtnut
10	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** Let `U_1` , and `U_2`, be two urns such that `U_1`, contains `3` white and `2` red balls, and `U_2,`contains only`1` white ball. A fair coin is tossed. If head appears then `1` ball is drawn at random from `U_1`, and put into `U_2,` . However, if tail appears then `2` balls are drawn at random from `U_1,` and put into `U_2`. . Now `1` ball is drawn at random from `U_2,` .61 . The probability of the drawn ball from `U_2,` being white is Watch Free Video Solution on Doubtnut
11	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** Let `U_1` and `U_2` be two urns such that `U_1` contains 3 white and 2 red balls, and `U_2` contains only 1 white ball. A fair coin is tossed. If head appears then 1 ball is drawn at random from `U_1` and put into `U_2`. However, if tail appears then 2 balls are drawn from `U_1` and put into `U_2`. Now, 1 ball is drawn at random from `U_2` Given that the drawn ball from `U_2` is white, the probability that head appeared on the coin is Watch Free Video Solution on Doubtnut

12	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** Let `a, b` and `c` be three real numbers satisfying `[a b c] [(1,9,7),(8,2,7),(7,3,7)] =[0 00] .....(E)` If the point `P(a, b, c),` with reference to `(E)`, lies on the plane `2x + y + z = 1,` then the value of `7a + b + c` is Watch Free Video Solution on Doubtnut
13	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** The minimum value of the sum of real number `a^(-5),a^(-4),3a^(-3),1,a^8,a n da^(10)w i t ha >0` is Watch Free Video Solution on Doubtnut
14	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** Let `f(theta)=sin(tan^(-1)((sintheta)/(sqrt(cos2theta)))),w h e r e-pi/4 Watch Free Video Solution on Doubtnut
15	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** If z is any complex number satisfying `|z-3-2i|lt=2` then the maximum value of `|2z-6+5i|` is Watch Free Video Solution on Doubtnut

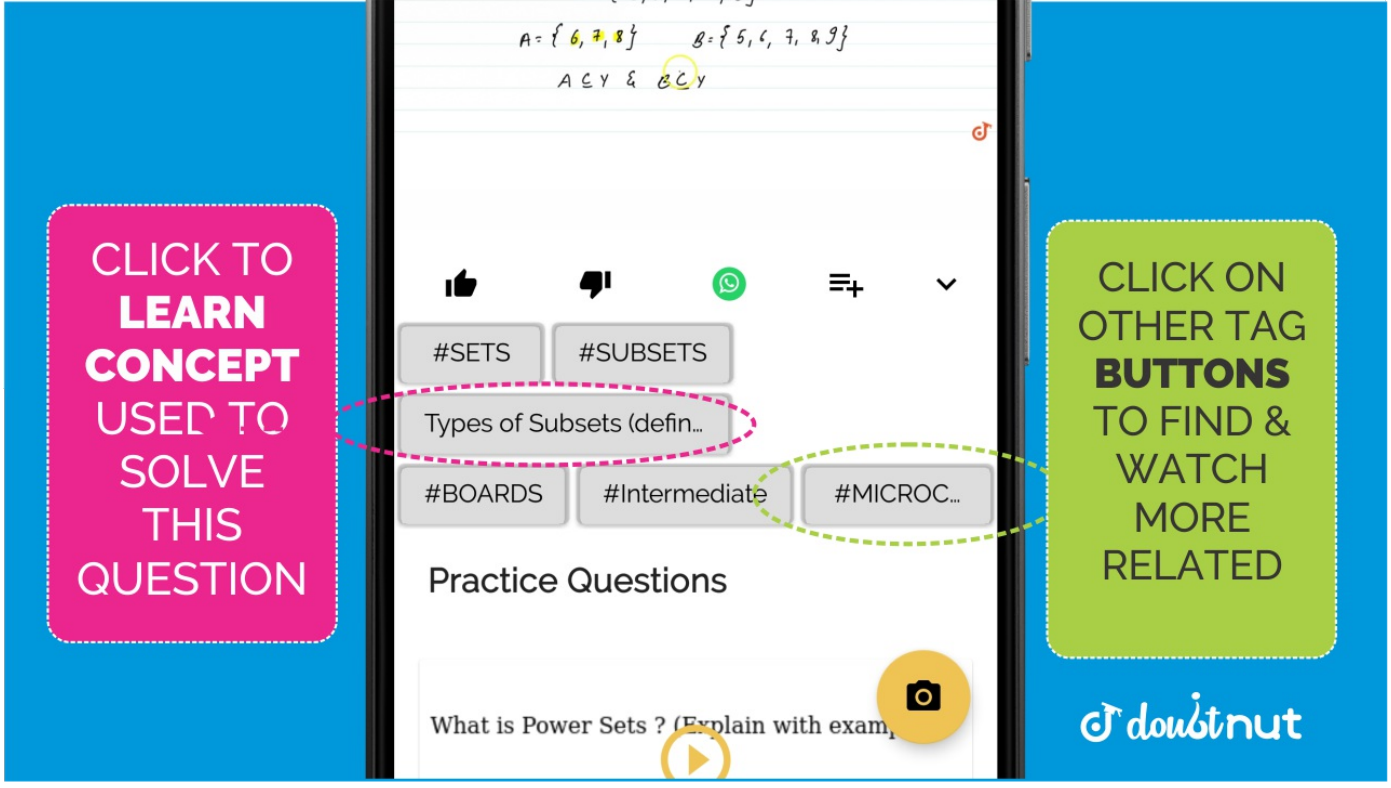


16	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** Let `f:[1,oo]` be a differentiable function such that `f(1)=2.` If `6int_1^xf(t)dt=3xf(x)-x^3` for all `xgeq1,` then the value of `f(2)` is Watch Free Video Solution on Doubtnut
17	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** The positive integer value of `n >3` satisfying the equation `1/(sin(pi/n))=1/(sin((2pi)/n))+1/(sin((3pi)/n))i s` Watch Free Video Solution on Doubtnut
18	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** Let `a_1, a_2, a_3, ,a_(100)` be an arithmetic progression with `a_1=3a n ds_p=sum_(i=1)^p a_i ,1lt=plt=100.` For any integer `n` with `1lt=nlt=20 ,` let`m=5ndot` If `(S_m)/(S_n)` does not depend on `n ,` then `a_2` is_____. Watch Free Video Solution on Doubtnut
19	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 1** Consider the parabola y2 = 8x. Let `Delta_1` be the area of the triangle formed by the end points of its latus rectum and the point P(`1/2`,2) on the parabola and `Delta_2` be the area of the triangle formed by drawing tangents at P and at the end points of latus rectum. `Delta_1/Delta_2` is : Watch Free Video Solution on Doubtnut

20	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** Let `f:[-1,2]->[0,oo)` be a continuous function such that `f(x)=f(1-x)fora l lx in [-1,2]dot` Let `R_1=int_(-1)^2xf(x)dx ,` and `R_2` be the area of the region bounded by `y=f(x),x=-1,x=2,` and the x-axis . Then (a)`R_1=2R_2` (b) `R_1=3R_2` (c)`2R_1` (d) `3R_1=R_2` Watch Free Video Solution on Doubtnut
21	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** In an `A.P.`, the `p^(th)` term is `1/p` and the `q^(th)` term is `1/p`. find the `(pq)^(th)` term of the `A.P.` Watch Free Video Solution on Doubtnut
22	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** Let `f(x) = x^2 and g(x) = sin x` for all `x in R.` Then the set of all `x` satisfying `(f o g o g o f) (x) = (g o g o f) (x),` where `(f o g) (x) = f(g(x)),` is find the value of the Watch Free Video Solution on Doubtnut
23	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** Q.3 If the coefficients of the `rth, (r + 1)th & (r + 2)th terms in the expansion of (1+x)^14` are in AP,find r: Watch Free Video Solution on Doubtnut

24	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** Let (x,y) be any point on the parabola `y^2 = 4x`. Let P be the point that divides the line segment from (0,0) and (x,y) n the ratio 1:3. Then the locus of P is : Watch Free Video Solution on Doubtnut
25	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** Let P(6,3) be a point on the hyperbola parabola `x^2/a^2-y^2/b^2=1`If the normal at the point intersects the x-axis at (9,0), then the eccentricity of the hyperbola is Watch Free Video Solution on Doubtnut
26	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** The value of `b` for which the equation `x^2+bx-1=0` and `x^2+x+b=0` have one root in common is Watch Free Video Solution on Doubtnut
27	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** Let `omega!=1` be cube root of unity and `S` be the set of all non-singular matrices of the form `[1a bomega1comega^2theta1],w h e r e` each of `a ,b ,a n dc` is either `omegaoromega^2dot` Then the number of distinct matrices in the set `S` is a. 2 b. `6` c. `4` d. `8` Watch Free Video Solution on Doubtnut

28	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** The circle passing through the point (-1,0) and touching the y-axis at (0,2) also passes through the point: Watch Free Video Solution on Doubtnut
29	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** If `("lim")_(xvec0)[1+x1n(1+b^2)]^(1/x)=2bsin^2theta,b >0,s mftheta in (-pi,pi],` then the value of `theta` is `+-pi/4` (b) `+-pi/3` (c) `+-pi/6` (d) `+-pi/2` Watch Free Video Solution on Doubtnut
30	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** Let `Ea n dF` be tow independent events. The probability that exactly one of them occurs is 11/25 and the probability if none of them occurring is 2/25. If `P(T)` deontes the probability of occurrence of the event `T ,` then `P(E)=4/5,P(F)=3/5` `P(E)=1/5,P(F)=2/5` `P(E)=2/5,P(F)=1/5` `P(E)=3/5,P(F)=4/5` Watch Free Video Solution on Doubtnut
31	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** Let `f:(0,1)->R` be defined by `f(x)=(b-x)/(1-bx)`, where b is constant such that `0 ltb lt 1` .then , Watch Free Video Solution on Doubtnut



32	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** Let L be a normal to the parabola `y^2=4x`.If L passes through the point (9,6) then L is given by Watch Free Video Solution on Doubtnut
33	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** The straight line 2x â^' 3y = 1 divides the circular region `x^2+ y^2 â‰¤ 6` into two parts. If S = { `( 2 , 3/4) , (5/2,3/4) , (1/4,-1/4), (1/8,1/4)`}, then the number of point(s) in S lying inside the smaller part is Watch Free Video Solution on Doubtnut
34	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** Let ` omega= e^((ipi)/3) and a, b, c, x, y, z` be non-zero complex numbers such that `a+b+c = x, a + bomega + comega^2 = y, a + bomega^2 + comega = z`.Then, the value of `(|x|^2+|y|^2+|y|^2)/(|a|^2+|b|^2+|c|^2)` Watch Free Video Solution on Doubtnut
35	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** The number of distinct real roots of ` x^4 - 4 x^3 + 12 x^2 + x - 1 = 0` is : Watch Free Video Solution on Doubtnut

36	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** Let `y^(prime)(x)+y(x)g^(prime)(x)=g(x)g^(prime)(x),y(0)=0,x in R ,` where `f^(prime)(x)` denotes `(dy(x))/(dx),` and `g(x)` is a given non-constant differentiable function on `R` with `g(0)=g(2)=0.` Then the value of `y(2)` is_____ Watch Free Video Solution on Doubtnut
37	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** Let `M` be a `3xx3` matrix satisfying `M[[0], [1] ,[0]]=[[-1], [2], [3]]` , `M[[1],[-1], [0]]=[[1], [1],[-1]]`,and `M[[1], [1], [1]]=[[0] ,[0], [12]]` Then the sum of the diagonal entries of `M` is _____. Watch Free Video Solution on Doubtnut
38	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** Let ` vec a=- hat i- hat k , vec b=- hat i+ hat ja n d vec c= hat i+2 hat j+3 hat k` be three given vectors. If ` vec r` is a vector such that ` vec rxx vec b= vec cxx vec d` and `vec r dot vec a=0,` then find the value of ` vec rdot vec bdot` Watch Free Video Solution on Doubtnut
39	**JEE ADVANCED MATHS SOLUTIONS - 2011 || Paper 2** If `f(x)=x^(3/2)(3x-10),xgeq0,` then `f(x)` is increasing in _____. Watch Free Video Solution on Doubtnut
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