A. K. GUPTA CLASSES

(JEE ADVANCE –SAMPLE PAPER)

Duration: 1Hour Total Marks: 75

MATHEMATICS

Section-1:(only one option correct type)

1 .Let $S\equiv\{(x,y): |||x|-2|-1|+|||y|-2|-1|=1\}$.If S is made out of wire, then the lenth of wire required is

a.$16\sqrt{2}$ b.$32\sqrt{2}$ c.$64\sqrt{2}$ d.$8\sqrt{2}$

2 .If fractional part of $\frac{1}{x}$ and x^2 for some $x\epsilon$ $(\sqrt{2},\sqrt{3})$ are equal then value of $x^4-\frac{3}{x}$ is

a.3 b.5 c.6 d.7

3. If the equation $ax^2+bx+c=x^3+\frac{1}{x}$,$(a,b,c\leq 0)$, has only real roots, then

a . there can be positive roots

b. there can be maximum two negative roots.

c. when all the roots are integers, the value of

a +b +c is equal to -14.

d. none of these

4. If 2Sin x siny+3cosy+6cosx sin y =7, then the value of $\tan^2 x + 2\tan^2 y$ is equal to

(a) 7 (b) 9 (c) 2 (d) none of these

5.Let the lines $(y-2)=m_1(x-5)$ and $(y+4)=m_2(x-3)$ intersect at right angle at (m_1 ,and m_2 are parameter)P .If locus of P is $x^2+y^2+gx+fy+7=0$,then f-g will equal to

a.10 b.21 c. 24 d .none of these

6.If $x^5-x^3+x=a$, then minimum value of x^6 is

a. a b. 2a-1 c.a+2 d.a-3

7. Consider triangle ABC. The equation of BC is y=x. The centriod of triangle is (8,3) and circum-centre is (9,3). If the circum-radius of triangle is R then the value of $R/\sqrt{5}$ is

a. 7 b. 3 c. 5 d. 8

8 .f (x) =$\sin x^{\sin x}$, $\left\{x \in (0, \frac{\pi}{2})\right.$ then range of f(x) will be

(a)(0, 1) (b) $[(\frac{1}{e})^{\frac{1}{e}}, 1)$ (c) $(\frac{1}{e}, 1)$ (d)none of these

Section-2:(one or more options correct type)

9. If graph of x y=1 is reflected in y=2x to give the 12 x^2 +r x y +sy^2+t=0, then

A .r=1, s=12, t=25 B. r=-1,s=12,t=1

C. r=-7, s=-12,t=25 D. r +s=-19

10.For the function f(x)=(x^2+bx+c)e^x and g(x)=(x^2 +b x +c)e^x+e^x(2x+b).Which of the following holds good?

a. if f(x)>0,for all real x⇒ g(x) > 0 b.if f(x)>0, for all real x ⇒g(x)>0

c .if g(x)>0, for all real x ⇒f(x)>0 d. if g(x)>0, for all real x⇒ f(x)>0

11.If f(x)=$\begin{cases} -x+1, x \le 1 \\ -(x-1)^2, x \ge 1 \end{cases}$, then the solution f(x)-f^{-1}(x)=0 is/are

a. -1 b.1 c.$\frac{1}{2}$ d.-2

12.A circle of radius r touches the curve y^2+4x=0 at origin .The centre of the circle lies to the left of the origin and this circle lies completely within the curve. Then exhaustive range of r belongs to

a .$(1, \frac{5}{2})$ b.(0,2) c.$(0, \frac{5}{2})$ d.(0,3)

Section-3: Match the followings

13.If f(x)=x^3+ax^2+bx+c=0 has three distinct inter roots and

(x^2 + 2x + 2)^3+a(x^2 + 2x + 2)^2+b(x^2+2x+2)+c=0 has no roots then

Column I	Column II
(a) Minimum value of a	(p) 0
(b)Minimum value of b	(q) 2
(c) Minimum value of c	(r) 3
d) Using , Minimum value of a,b and c .If the roots of f´ (x) =k ,are equal, then k =	(s) -1

Section-4: paragraph based question (Question no.13-14)

Consider a rational function

$f(x)=\frac{x^2-6x+4}{x^2+2x+4}$ and a quadratic function $g(x)=(1+m)x^2-2(1+3m)x-2(1+m)$,where m is a parameter.

14.If $\cot\cot^{-1}f(x)=k$, has exactly two distinct real solution then the integral value of k can be

a.0 b.-1 c.1 d.5.

15.If the range of the function f(x)lies between the roots of g(x)=0,then the number of integral values of m equals to

a.8 b.6 c.7 d.9

Section-5:(Integer value correct type)

This section contains 5 questions.The answer to each question is single digit integer,ranging from 0 to 9

16. Let 2x+3y=0 and 3x-2y=0 intersect at A. Let another line whose equation is ax + by +c=0 intersects the given two lines at Band C respectively. A circle touches AB at A and BC at D. It intersects AC in E. If CE =3,CD=6, then BD=.....

17. The maximum value of $(x_1+\sqrt{4-x_2^2})^2+(\sqrt{4-x_1^2}-x_2)^2$ -11=....

18 .If ,x ,yϵR, satisfy simultaneously the equation $\log x+\frac{\log(xy^8)}{\log^2 x+\log^2 y}=2$,and

$\log y+\frac{\log(\frac{x^8}{y})}{\log^2 x+\log^2 y}=0$, then value of $\frac{xy}{5}$ will be...

19. Let A denotes the value of expression $x^4+4x^3+2x^2-4x+7$,where $x=\cot\frac{11\pi}{8}$ and B denotes the value of the expression

$\frac{1-\cos 8\theta}{\tan^2 4\theta}+\frac{1+\cos 8\theta}{\cot^2 4\theta}$,$\theta = 9^0$, then value of $\frac{AB}{2}$=?

20.The maximum integral value of ´a=2n+1´ for which the equation$2x^3-3x^2-12x+a=0$

have three real and distinct roots then value of n will be equal to