nswei	r Sh	eet No.	MATH	EM	ATICS (OBJECT	IVE P	ART)	<u> </u>	Roll No.
			PART -	II	21/01		(**)		
					INTERMEDIATE	(51	nart Syllabus)		
	- 6	and at	<u></u>	Fi	TK-21 ctitious Roll No. (For	Office	Use)	5	Sign. Candidate
		updnt.	TICS					Syllabu	ıs)
VIA' PAR'			TICS	(11	21/01, NTERMEDIATE) (♥♥)		•	Marks	: 20
			ART)		(≎≎)			Time	: 30 Minutes
ote:			Dali Mi	a in	enace provided. (Over	writing, cutting, to attempted	using of	r lead pencii wiii
					. All questions are possible answers				
1	$\frac{-}{dx}$	(sin√x	() = 					T	1
			\sqrt{x}	В	$-\cos\sqrt{x}$	C	$\frac{-1}{2\sqrt{x}}\cos\sqrt{x}$	D	$\frac{1}{2\sqrt{x}}\cos\sqrt{x}$
	A		SVX			1_	$2\sqrt{x}$	<u> </u>	271
2	$\frac{d}{d}$	(sinh-	(x) =						
	$\frac{dx}{dx}$				1		1		-1
	A	— <u> </u>	$\frac{1}{1+x^2}$	В	$\frac{1}{\sqrt{1+x^2}}$	C	$\sqrt{1-x^2}$	D	$\sqrt{1-x^2}$
	<u> </u>			L	VIII				
3	1(:		$+\cos^2 x)db$	T				T	1 ,
	Α	$\sin x$	$+\cos x + c$	В	$\cos 2x + \sin 2x + c$	C	x + c	D	$\frac{1}{2}x^2 + c$
			1		4				
4	∫ ($tan^{-1} x$	$(\frac{1}{1+x^2})dx$	x =	4				
		1,	1 \2 .				2 / 1 > 2		$(\tan^{-1} x)^2 + c$
	Α	$\frac{-(\tan 2)}{2}$	$(n^{-1}x)^2 + c$	В	$\ln(\tan^{-1}x)+c$	С	$2(\tan^{-1} x)^2 + c$	D	(tall x) +c
		<u></u>							
5	(($-\frac{1}{\sqrt{2}}$	$\frac{1}{-a^2}$) $dx =$		`	C),	3	
						П	? ()		(r)
	٨	$\frac{1}{-}$ tar	$1^{-1}\left(\frac{x}{a}\right)+C$	В	$\frac{1}{a}Sec^{-1}\left(\frac{x}{a}\right) + c$	С	$\tan^{1}\left(\frac{x}{a}\right) + c$	D	$Sec^{-1}\left(\frac{x}{a}\right)+c$
	_	a	(<i>a</i>)		a (a)		(a)		
	[[1 1	7				104		
6	0	$\frac{1}{1+x^2}$	ax =			7	_		π
	Α		$\frac{\pi}{2}$	В	$\frac{\pi}{6}$	С	$\frac{\pi}{3}$	D	$\frac{\pi}{4}$
	1	1	2		6				
7	T	he fun	ction $f(x)$	·) = -	$\frac{3x}{x^2+1} \text{ is } \underline{\qquad} \text{ fur}$	ction	1.		
	A	T	Even	$\frac{\lambda}{\mathbf{B}}$	Odd	C	Linear	D	Quadratic
	1.	c ()		tha	$g_{\alpha}(x) =$				
8	11	1g(x)=	$-\frac{1}{x^2}, x \neq 0$, the	$\mathbf{n} \ gog(x) =$				1
	A		1	В	x^2	C	x^4	D	$\frac{1}{x^4}$
			7						
9	T	he der	rivative of	$\frac{x^3+}{}$	$\frac{2x^2}{x^3}$ equals;				
			2	1	-2	1	1	D	$\frac{-1}{2x^2}$
	1		44	В		C	$\frac{1}{2x^2}$	17	$2x^2$
	A	A	r^2	В	x^2				
	A	d .	$\frac{2}{x^2}$	В	$\frac{-2}{x^2}$				
10	A	$\frac{d}{dx}(x-$	$\frac{\overline{x^2}}{(\frac{1}{x})} =$	В	x ²				1
10	A	$\frac{d}{dx}(x-$	$\frac{\overline{x^2}}{\frac{1}{x}} = \frac{1}{x}$	В	1	C	$1 + \frac{1}{x^2}$	D	$1-\frac{1}{\kappa^2}$

AJK-21

T				YJK	-21					
T	The circle $x^2 + y^2 + 2gx + 2fy + c = 0$, passes through the origin if;									
A	c = 0	В	c = -1	C	c = 1	D	c = 2			
F	ocus of the par	abola	$x^2 = -16y$ is;							
A	(0,4)	В	(0,-4)	C	(4,0)	D	(-4,0)			
F	oci of the hyper	bola -	$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$, are	· · · · · · · · · · · · · · · · · · ·						
A	(±a,0)	В	$(0,\pm a)$	C	(±ae,0)	D	(0,±ae)			
T	he unit vector i	n the ç	direction of $v = 2$	$\underline{i} - \underline{j}$ is						
A	$\frac{2\underline{i}-\underline{j}}{3}$	В	$\frac{2i-\underline{j}}{\sqrt{3}}$	C	$\frac{2\underline{i}-\underline{j}}{5}$	D	$\frac{2\underline{i}-\underline{j}}{\sqrt{5}}$			
If	the vectors 2i+	+4 <u>j</u> -′	$7\underline{k}$ and $2\underline{i} + 6\underline{j} +$	xk are	perpendicular, th	en $x =$	· · · · · · · · · · · · · · · · · · ·			
A	8	В	4	C	2	D	1			
2 <u>i</u>	$\times 2\underline{j}.\underline{k} =$. Coll	L	/ / / / / / / / / / / / / / / / / / / /			
A	2	В	4	C	8/04	D	1			
Th	e distance of th	ie poin	nt (-1,3) from x-a	xis is;						
A	1	В	-1	C	3	D	-3			
Slo	pe of the straig	tht line	$e \ ax + by + c = 0,$	is;		.41				
A	$\frac{a}{b}$	В	$-\frac{a}{b}$	C	$\frac{b}{a}$	D	$-\frac{b}{a}$			
The	e lines $l_{\rm l}$ and $l_{\rm 2}$	with	slopes m_1 and m_2	respec	tively are perpend	licula	r if;			
A	$m_1 = m_2$	В	$m_1 m_2 = 1$	C	$m_1 m_2 = -1$	D	$m_1 + m_2 = 0$			
The	e point (1,2) lies	s in the	e solution of the i	nequal	ity;					
				1			· · · · · · · · · · · · · · · · · · ·			
	A F A F A If A Slo A The A	Focus of the part A $(0,4)$ Foci of the hyper A $(\pm a,0)$ The unit vector is A $\frac{2i-j}{3}$ If the vectors $2i-j$ A 8 $2i \times 2j.k = j$ A 2 The distance of the A 1 Slope of the straig A $\frac{a}{b}$ The lines l_1 and l_2 A $m_1 = m_2$	Focus of the parabola A $(0,4)$ B Foci of the hyperbola A $(\pm a,0)$ B The unit vector in the control a B If the vectors $2i + 4j - a$ A a B $2i \times 2j \cdot k = a$ A a B The distance of the point a B Slope of the straight line A a B The lines l_1 and l_2 with a B The lines l_1 and l_2 with a B	The circle $x^2 + y^2 + 2gx + 2fy + c = 0$, $\frac{1}{2}$ A $c = 0$ B $c = -1$ Focus of the parabola $x^2 = -16y$ is; A $(0,4)$ B $(0,-4)$ Foci of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$, are $\frac{1}{2}$ A $(\pm a,0)$ B $(0,\pm a)$ The unit vector in the direction of $\underline{y} = 2$ A $\frac{2i-j}{3}$ B $\frac{2i-j}{\sqrt{3}}$ If the vectors $2\underline{i} + 4\underline{j} - 7\underline{k}$ and $2\underline{i} + 6\underline{j} + 6\underline{j}$	The circle $x^2 + y^2 + 2gx + 2fy + c = 0$, passes to A $c = 0$ B $c = -1$ C Focus of the parabola $x^2 = -16y$ is; A $(0,4)$ B $(0,-4)$ C Foci of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$, are A $(\pm a,0)$ B $(0,\pm a)$ C The unit vector in the direction of $y = 2i - j$ is A $\frac{2i-j}{3}$ B $\frac{2i-j}{3}$ C If the vectors $2i + 4j - 7k$ and $2i + 6j + xk$ are A 8 B 4 C $2i \times 2j \cdot k =$ A 2 B 4 C The distance of the point (-1,3) from x-axis is; A 1 B -1 C Slope of the straight line $ax + by + c = 0$, is; A $\frac{a}{b}$ B $-\frac{a}{b}$ C The lines l_1 and l_2 with slopes m_1 and m_2 respectively.	The circle $x^2 + y^2 + 2gx + 2fy + c = 0$, passes through the origin $A = c = 0$ $B = c = -1$ $C = 1$ Focus of the parabola $x^2 = -16y$ is; $A = (0,4)$ $B = (0,-4)$ $C = (4,0)$ Foci of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$, are $\frac{x^2}{a^2} - \frac{y^2}{a^2} - \frac{y^2}{b^2} = 1$, are $\frac{x^2}{a^2} - \frac{y^2}{a^2} = 1$, are $\frac{x^2}{a^2} - \frac{y^2}{a^2} = 1$, are $\frac{x^2}{a^2} -$	The circle $x^2 + y^2 + 2gx + 2fy + c = 0$, passes through the origin if; A $c = 0$ B $c = -1$ C $c = 1$ D Focus of the parabola $x^2 = -16y$ is; A $(0,4)$ B $(0,-4)$ C $(4,0)$ D Foci of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$, are A $(\pm a,0)$ B $(0,\pm a)$ C $(\pm ae,0)$ D The unit vector in the direction of $\underline{y} = 2i - \underline{j}$ is A $\frac{2i - \underline{j}}{3}$ B $2i - \underline{j}$ C $2i - \underline{j}$ D If the vectors $2i + 4\underline{j} - 7\underline{k}$ and $2i + 6\underline{j} + x\underline{k}$ are perpendicular, then $x = 1$ A 8 B 4 C 2 D The distance of the point $(-1,3)$ from x-axis is; A 1 B -1 C 3 D Slope of the straight line $ax + by + c = 0$, is; A $a + b + by + c = 0$, is; A $a + b + by + c = 0$, is; The lines l_1 and l_2 with slopes m_1 and m_2 respectively are perpendicular. A $m_1 = m_2$ B $m_1 m_2 = 1$ C $m_1 m_2 = -1$ D			

(The End)

PAPER : PART - II

INTERMEDIATE

TIME : 2:30 Hours

(SUBJECTIVE PART)

A JK-21
Attempt any TWENTY FIVE (25) short questions in all selecting eight from NOTE:-Q. 2 and Q. 3 each and nine from Q. 4. $(25 \times 2 = 50)$

SECTION - I

2-	Write	short	answers	of	any	eight	parts.	

 $(2 \times 8 = 16)$

i	Find the domain and range of $f(x) = \sqrt{x^2 - 9}$	ii	Determine whether $f(x) = Sin x + Cos x$ is even or odd.
iii	For the functions $f(x) = \frac{1}{\sqrt{x-1}}$ and $g(x) = \frac{1}{x^2}, x \neq 0$ find $f \circ g(x)$ and $g \circ f(x)$	iv	Evaluate $\lim_{n\to\infty} \left(1+\frac{3}{n}\right)^{2n}$
V	Differentiate $y = \frac{1}{\sqrt{x}}$ by definitions.	vi	Differentiate $\frac{x^2-1}{x^2-3}$ w.r.t x
vii	$y = (3x^2 - 2x + 7)^6 \text{ find } \frac{dy}{dx}$	viii	$\tan y(1 + \tan x) = (1 - \tan x) \text{ show that}$ $\frac{dy}{dx} = -1$
ix	Differentiate $(\ln x)^x$ w.r.t \hat{x}	х	Find y_2 if $y = (2x+5)^{\frac{3}{2}}$
xi	Find the extreme values of the function $f(x) = 5x^2 - 6x + 2$	xii	Find $\frac{dy}{dx}$ if $y = e^{-2x} \sin 2x$

3- Write short answers of any eight narts.

 $(2 \times 8 = 16)$

Wri	te short answers of any eight parts.	*	$(2 \times 8 = 16)$
i	Find dy if $y = x^2 - 1$ and x changes from 3 to 3.02	ii	Evaluate the integral $\int \frac{(1-\sqrt{x})^2}{\sqrt{x}} dx, (x>0)$
iii	Evaluate $\int \frac{1}{x \ln x} dx$	iv	Evaluate the integral $\int e^x \left(\frac{1}{x} + \ln x\right) dx$
V	Evaluate $\int \frac{3x+1}{x^2-x-6} dx$	vi	Evaluate $\int_{1}^{2} (x^2 + 1) dx$
vii	Find the area between the x-axis and the curve $y = x^2 + 1$ from $x = 1$ to $x = 2$	viii	Solve the differential equation $\frac{dy}{dx} = -y$
ix	Show that the point $A(0,2)$, $B(\sqrt{3},-1)$ and $C(0,-2)$ are vertices of a right triangle.	x	Two points P and O' are given in xy-coordinate system. Find the XY-coordinates of P referred to the translated axis. $P(-6,-8)$; $O'(-4,-6)$
xi	Find equation of line through (-5,-3) and (9,-1)	xii	Determine the value of P such that the lines, $2x-3y-1=0$, $3x-y-5=0$ and $3x+py+8=0$ meet at a point.

4-Write short answers of any nine p

 $(2 \times 9 = 18)$

	vitte short answers of any nine parts.		$(2 \times 9 = 18)$
i	Graph the solution set of given linear inequality in $xy-plane$, $5x-4y \le 20$	·; ii	Find an equation of the circle with ends of a diameter at (-3,2) and (5,-6)
iii	Write an equation of the parabola with given elements. Focus (-3,1); directrix $x-2y-3=0$	iv	Find an equation of directrix of given parabola; $x^2 = 4(y-1)$
v	Find eccentricity of $\frac{y^2}{16} - \frac{x^2}{9} = 1$	vi	Find Foci and vertices of hyperbola. $9x^2-12x-y^2-2y+2=0$
vii	Find a unit vector in the direction of the vector $\underline{v} = 2\underline{i} + 6\underline{j}$	viii	Find a vector whose magnitude is 2 and is parallel to $-\underline{i} + \underline{j} + \underline{k}$
ix	Find the direction cosines for the vector: $\underline{v} = 3\underline{i} - \underline{j} + 2\underline{k}$	x	Find the cosine of the angle θ between \underline{u} and \underline{v} : $\underline{u} = [2,-3,1], \underline{v} = [2,4,1]$
xi	Compute $\underline{a} \times \underline{b}$, check your answer by showing that \underline{a} is perpendicular to $\underline{a} \times \underline{b}$. $\underline{a} = -4\underline{i} + \underline{j} - 2\underline{k}$, $\underline{b} = 2\underline{i} + \underline{j} + \underline{k}$	xii	Find volume of the parallelepiped determined by; $\underline{u} = \underline{i} + 2\underline{j} - \underline{k}; \underline{v} = \underline{i} - 2\underline{j} + 3\underline{k}, \underline{w} = \underline{i} - 7\underline{j} - 4\underline{k}$
xiii	A force $\underline{F} = 4\underline{i} - 3\underline{k}$, passes through the point A(2,-2,5). Find the moment of \underline{F} about the point B(1,-3,1)		*

Attempt any three questions from this section. Note:-

	-	All questions carry equal Marks.	(10x3=30)							
5	(a)	Evaluate $\lim_{\theta \to 0} \frac{\tan \theta - \sin \theta}{\sin^3 \theta}$		(05)							
	(b)	If $x = a\cos^3\theta$, $y = b\sin^3\theta$ then show that $a\frac{dy}{dx} + b\tan\theta = 0$		(05)							
6	(a)	Show that $\int \sqrt{a^2 - x^2} dx = \frac{a^2}{2} \sin^{-1} \frac{x}{a} + \frac{x}{2} \sqrt{a^2 - x^2} + c$		(05)							
U	(b)	Find h such that the points A(h,1),B(2,7)and C(-6,-7) are vertices of a right triangle with right angle at the vertex A.									
7	(a)	Evaluate $\int_{0}^{\frac{\pi}{4}} \frac{1}{1+\sin x} dx$									
	(b)	Also find corner points	$x - 3y \le 6$ $x + 3y \le 12$ $\ge 0, y \ge 0$	(05)							
0	(a)	Find the volume of Tetrahedron with vertices. (0,1,2)(3,2,1)(1,2	,1) and (5,5,6)	(05)							
8	(b)	Write an equation of circle passing through the points A(5,6), B(-3,2), C(3,-4)									
9	(a)	Find the point on the curve $y = x^2 - 1$ that is closest to the point (3,-1)	(05)							
	(b)	Write an equation of the parabola with given elements. Axis part the points $(0,3)$, $(3,4)$ and $(4,11)$ lie on the graph.	allel to y-axis,	(05)							