BWP-21

Mathematics	(D)	L.K.No. 1312	Paper Code No. 8197
Paper II	(Objective Type)	Inter – A – 2021	Session (2017 -19) to (2020 – 22)
Time :	30 Minutes	Inter (Part II)	

Q.No.1 (1)	$\text{Lim}_{x \to 3} \sqrt{x^2 + x + 4}$ = : (A) 4 (B) – 4 (C) 6 (D) 0
(2)	$\frac{d}{dx}(\text{Sin}^{-1} x) =$: (A) $\frac{-1}{\sqrt{1-x^2}}$ (B) $\frac{1}{1+x^2}$ (C) $\frac{-1}{1+x^2}$ (D) $\frac{1}{\sqrt{1-x^2}}$
(3)	$\frac{d}{dx}(Sinx) =$: (A) $-Cos\,x$ (B) $Cos\,x$ (C) $tan\,x$ (D) $Sec\,x$
(4)	$\text{Lim}_{x \to 0} \frac{Sinax}{Sinbx}$ = : (A) $\frac{b}{a}$ (B) 1 (C) $\frac{a}{b}$ (D) $\frac{-a}{b}$
(5)	$1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!}$ + ----- is the Maclaurin's Series Expansion of : (A) Sin x (B) Cos x (C) e^x (D) e^{2x}
(6)	$\int \frac{1}{x} dx$: (A) $\frac{x^{-2}}{-2} + C$ (B) $\frac{x^0}{0} + C$ (C) $\frac{1}{x^2} + C$ (D) ln x + C
(7)	$\int tan^2 x\, dx$ = : (A) 2 tan x + c (B) tan x – c (C) tan x + x + c (D) tan x – x + c
(8)	If f (x) = a^x then $\acute{f}$ (x) = : (A) a^x ln a (B) a^x (C) x a^{x-1} (D) $\frac{a^x}{lna}$
(9)	$\int Cosecx dx$: (A) – Cosec x Cot x + C (B) ln (Cosec x – Cot x) + C (C) ln (Cosec x + Cot x) + C (D) ln (Sec x + tan x) + C
(10)	Slope of line 2y = x – 7 is : (A) $\frac{1}{2}$ (B) 2 (C) $\frac{-1}{2}$ (D) – 2
(11)	The distance of the point (2 , 3) from y – axis is : (A) 3 (B) 2 (C) – 2 (D) – 3
(12)	$\int e^x$ (Cosx + Sinx) dx : (A) $e^x Sinx + C$ (B) $e^x Cosx + C$ (C) $-e^x Cosx + C$ (D) $-e^x Sinx + C$
(13)	Point Slope form of equation of Straight line is : (A) y = mx + c (B) $y - y_1 = m(x - x_1)$ (C) $\frac{x}{a} + \frac{y}{b} = 1$ (D) x Cosα + y Sinα = P
(14)	$\hat{k} \times \hat{j}$: (A) $\hat{i}$ (B) $-\hat{i}$ (C) 1 (D) 0
(15)	If $\underline{u} = 2\underline{i} - \underline{j} + 4\underline{k}$ then $\underline{u} \times \underline{v}$: (A) 8 (B) 1 (C) –1 (D) 0
(16)	Which of the following is the solution of inequality x + 2y < 6 : (A) (4 , 1) (B) (1 , 3) (C) (3 , 3) (D) (1 , 4)
(17)	If $\underline{v} = \underline{i} - \underline{j} - \underline{k}$ then $\lvert\underline{v}\rvert$: (A) $\sqrt{3}$ (B) 3 (C) 9 (D) 1
(18)	The equation $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ represents : (A) Hyperbola (B) Circle (C) Parabola (D) Ellipse
(19)	The Conic is a Hyperbola if Eccentricity is : (A) $e = 1$ (B) $0 < e < 1$ (C) $e > 1$ (D) $e = \frac{1}{2}$
(20)	Directrix of the Parabola $x^2 = -4ay$ is : (A) x = a (B) x = – a (C) y = a (D) y = – a

www.eduvision.edu.pk

B

BWP-1

Roll No.	1312 - 24000	Session (2017 –19) to (2020 – 22)	Inter (Part – II)
Mathematics (Subjective)	Inter – A – 2021	Time 2 : 30 Hours Marks : 80	

Note: It is compulsory to attempt any(8 – 8)Parts each from Q No 4 ...

Part - I

25 x 2 = 50

Q.No.2	(i)	Given $f(x) = x^3 - ax^2 + bx + 1$, if $f(2) = -3$ and $f(-1) = 0$ find the values of a and b.		
	(ii)	Evaluate $\lim_{x\to 3} \frac{x-3}{\sqrt{x}-\sqrt{3}}$	(iii)	Evaluate $\lim_{x\to 0} \frac{1-Cosx}{Sin^2x}$
	(iv)	Find $\frac{dy}{dx}$ if $y = \frac{x}{lnx}$	(v)	Find y_2 if $y = \sqrt{x} + \frac{1}{\sqrt{x}}$
	(vi)	Prove that $\frac{d}{dx} Sec^{-1}x = \frac{1}{\lvert x\rvert\sqrt{x^2-1}}$	(vii)	Differentiate $\frac{x^2+1}{x^2-3}$
	(viii)	Find $\acute{f}(x)$ if $f(x) = \ln(\sqrt{e^{2x}+e^{-2x}})$	(ix)	For real valued function f, find $f^{-1}(-1)$ $f(x) = \frac{2x+1}{x-1}$ $x > 1$
	(x)	Differentiate w.r.t. 'x' $Sin^{-1}\sqrt{1-x^2}$	(xi)	Differentiate w.r.t. 'x'; $y = e^{-2x} Sin2x$
	(xii)	If $y = x^4 + 2x^2 + 2$ prove that $\frac{dy}{dx} = 4x\sqrt{y-1}$		
Q.No.3	(i)	Find δy of $y = f(x) = x^2$, when $x = 2$ and $dx = 0.01$		
	(ii)	Find the area between the x – axis and the curve $y = x^2 + 1$ from $x = 1$ to $x = 2$		
	(iii)	Show that the points A(0, 2), B($\sqrt{3}$, –1) and C(0, –2) are vertices of right triangle.		
	(iv)	Check whether the point (5, 8) lies above or below the line $2x - 3y + 6 = 0$		
	(v)	Evaluate $\int \frac{e^x}{e^x+3} dx$	(vi)	Evaluate $\int Sin^2x\, dx$
	(vii)	Evaluate $\int x\, lnx\, dx$	(viii)	Evaluate $\int_1^2 (x^2+1)dx$
	(ix)	Evaluate $\int (2x+3)^{\frac{1}{2}} dx$	(x)	Solve the Differential Equation $\frac{dy}{dx} = \frac{1-x}{y}$
	(xi)	Find an equation of vertical line through (–5, 3)	(xii)	Find the equation of lines represented by $3x^2 + 7xy + 2y^2 = 0$
Q.No.4	(i)	Graph the Solution Set of $2x + y \leq 6$		
	(ii)	Find the Centre and Foci of $\frac{x^2}{4} - \frac{y^2}{9} = 1$		
	(iii)	Find the Centre and Radius of Circle $5x^2 + 5y^2 + 14x + 12y - 10 = 0$		
	(iv)	Write the equation of Tangent and Normal to the circle $x^2 + y^2 = 25$ at (4, 3)		
	(v)	Find the Focus and Vertex of the Parabola $x^2 = -16y$		
	(vi)	Find point of Intersection of Conics $x^2 + y^2 = 8$ and $x^2 - y^2 = 1$		
	(vii)	Find equation of Parabola if Focus is (–3, 1) and Directrix $x = 3$		
	(viii)	Find a Unit Vector in the Direction of $\underline{v} = \frac{1}{2}\underline{i} + \frac{\sqrt{3}}{2}\underline{j}$		
	(ix)	Find α, so that $\lvert\alpha\underline{i} + (\alpha+1)\underline{j} + 2\underline{k}\rvert = 3$		
	(x)	Find Cosine of angle between the vectors $\underline{u} = [2, -3, 1]$ and $\underline{v} = [2, 4, 1]$		

B

www.edivision.edu.pk

P.T.O.

BWP-21

L.K.No.1312

	(xi)	Find Area of Parallelogram with vertices A(1,2,−1), B(4,2,−3), C(6,−5,2) and D(9,−5,0)	
	(xii)	Find α if $\underline{i} - \underline{j} + \underline{k}$, $\underline{i} - 2\underline{j} - 3\underline{k}$ and $3\underline{i} - \alpha\underline{j} + 5\underline{k}$ are Coplanar.	
	(xiii)	Find the Direction Cosines of $\underline{v} = 3\underline{i} - \underline{j} + 2\underline{k}$	

(Part – II)

Q.No.5	(a)	Find values of m and n so that $f(x) = \begin{cases} mx & \text{if } x < 3 \\ n & \text{if } x = 3 \\ -2x+9 & \text{if } x > 3 \end{cases}$ is continuous at x = 3	(5)
	(b)	If $\tan y(1 + \tan x) = 1 - \tan x$, then show that $\frac{dy}{dx} = -1$	(5)
Q.No.6	(a)	Find $\int Tan^3x \, . Secx \, dx$	(5)
	(b)	Find h such that the points A(h,1), B(2,7) and C(−6,−7) are the vertices of a Right Triangle with Right Angle at the Vertex A.	(5)
Q.No.7	(a)	Evaluate $\int_{-1}^{2} (x + \lvert x \rvert)\, dx$	(5)
	(b)	Minimize $z = 3x + y$ subject to constraints $3x + 5y \geq 15$, $x + 6y \geq 9$ $x \geq 0$, $y \geq 0$	(5)
Q.No.8	(a)	Show that the Circles $x^2 + y^2 + 2x - 2y - 7 = 0$ and $x^2 + y^2 - 6x + 4y + 9 = 0$ touch externally.	(5)
	(b)	Use Vectors Method, prove that in any Triangle ABC, $a^2 = b^2 + c^2 - 2bcCosA$	(5)
Q.No.9	(a)	If $y = a\,Cos(\ln x) + b\,Sin(\ln x)$ prove that $x^2 \frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = 0$	(5)
	(b)	A Parabolic Arch has a 100 m base and height 25 m. Find the height of the arch at the point 30 m from the centre of the base.	(5)

www.eduvision.edu.pk

25-06-2021