TALEEM CITY INSTITUTE

Ameenpur, Faisalabad 03126987979

Name:		Roll#:		Class:	Inter Part-II
Subject:	Mathematics-12	Date:		Time:	
Test Type #	Type 8 - Short Test - Marks=30				
Test Syllabus:	Unit-1,				

Q.1 Circle the Correct Answers. **(6x1=6)**

i **If a variable y depends on a variable x in such a way that each value of x determines exactly one value of y, then y is a ----------**

(A) Independent variable (B) not function (C) function (D) None of these

ii **If *y* is an image of *x* under the function f, we denote it by:**

(A) $x = ¦(y)$ (B) $x = y$ (C) $y = ¦(x)$ (D) $¦(x, y) = c$

iii $\lim_{x\to 0} \frac{\sin x}{x} =$ _____

(A) 1 (B) $\frac{\pi}{180}$ (C) -1 (D) $\frac{180}{\pi}$

iv $Limit_{x\to 0} \frac{sin7x}{x} =$_____:

(A) 7 (B) $\frac{1}{7}$ (C) 1 (D) 0

v $\lim_{x\to 3} \frac{2x^2-5x-3}{3-x} =$

(A) -5 (B) -7 (C) -9 (D) limit does not exist

vi The function $f(x) = \frac{2+3x}{2x}$ is not continuous at:

(A) $x = -3$ (B) $x = -\frac{2}{3}$ (C) $x = 0$ (D) $x = 1$

Q.2 Write short answers to any (7) of the following questions. **(7x2=14)**

i. Find $\frac{f(a+h)-f(a)}{h}$ and simplify where $f(x) = 6x - 9$

ii. A stone falls from a height of 60m on the ground, the height h after x second is approximately given by $h(x) = 40 - 10x^2$. What is the height of the stone when $x = 1.7\, sec$?

iii. Find $f^{-1}(x)$ when $f(x) = (-x + 9)^3$

iv. Without finding f(x). State Domain and Range of $f^{-1}(x)$ if $f(x) = \sqrt{x+2}$.

v. Define limit of function f:

vi. Evaluate $\lim_{x\to 0} (1 + 2x^2)^{\frac{1}{x^2}}$

vii. Evaluate $\lim_{x\to 0} \frac{1-cos\, 2x}{x^2}$.

viii. Evaluate $Lim_{x\to+\infty} \frac{5x^4-10x^2+1}{-3x^3+10x^2+50}$

ix. Evaluate the limit $\lim_{\theta\to 0} \frac{1-cos\theta}{Sin^2\theta}$.

x. Evaluate $\lim_{x\to 0} \frac{Secx-cosx}{x}$.

NOTE: Attempt any ONE (1) questions. **(5+5=10)**

3(a) If $f(x) = \frac{2x+1}{x-1}$; $x \neq 1$, then find $f^{-1}(x)$ and verify that $(fof^{-1})x = x$.

(b) Find $\lim_{x\to 0} \frac{1-cosx}{sin^2 x}$.

4(a) Evaluate $\lim_{x\to a} \frac{x^n-a^n}{x^m-a^m}$.

(b) If $f(x) = \begin{cases} 3x & if \quad x \leq -2 \\ x^2 - 1 & if \quad -2 < x < 2 \\ 3 & if \quad x \geq 2 \end{cases}$, discuss continuity at $x = 2$.

MCQs Ans Key

Q:1 (C) Q:2 (C) Q:3 (A) Q:4 (A) Q:5 (B) Q:6 (C)

TALEEM CITY INSTITUTE

Ameenpur, Faisalabad 03126987979

Name:		Roll#:		Class:	Inter Part-II
Subject:	Mathematics-12	Date:		Time:	
Test Type #	Type 7 - Short Test (No Choice) - Marks=30				
Test Syllabus:	2.1-2.6				

Q.1 Circle the Correct Answers. **(6x1=6)**

i Instantaneous rate of change of y with respect to x is given by?

(A) $\frac{\delta y}{\delta x}$ (B) $\frac{\delta x}{\delta y}$ (C) $\frac{dy}{dx}$ (D) $\frac{dx}{dy}$

ii $\frac{d}{dx}(ln\,2x) =$ _____:

(A) $\frac{1}{2x}$ (B) $2x$ (C) $\frac{2}{x}$ (D) $\frac{1}{x}$

iii If $y = ln\,e^x$, then $\frac{dy}{dx}$ =_____:

(A) e^x (B) $\frac{1}{e^x}$ (C) 1 (D) e^{x-1}

iv $\frac{d}{dx}[log_{10}(x+1)] =$

(A) $\frac{-1}{x+1}$ (B) $\frac{1}{(x+1)ln\,10}$ (C) $\frac{-1}{x+1}$ (D) $\frac{-1}{(x+1)ln\,10}$

v $\frac{d}{dx}(cosh\,3x) =$_____:

(A) $-3sinh\,3x$ (B) $3sech\,3x$ (C) $3tanh\,3x$ (D) $3sinh\,3x$

vi $\frac{d}{dx}[ln\,cos\,x]$:

(A) tan x (B) cot x (C) -tan x (D) -cot x

Q.2 Write short answers of the following questions. **(7x2=14)**

i. Define dependent variable.

ii. Define implicit function also write one example.

iii. If $y = x^4 + 2x^2 + 2$ prove that $\frac{dy}{dx} = 4x\sqrt{y-1}$.

iv. Differentiate $\frac{(x^2+1)^2}{x^2-1}$ w.r.t 'x'.

v. Prove that: $\frac{d}{dx}\left[tan^{-1}x\right] = \frac{1}{1+x^2}$

vi. Differentiate sin^2x w.r.t cos^4x.

vii. Find $f'(x)$ if $y = \sqrt{ln(e^{2x} + e^{-2x})}$.

NOTE: Attempt the long question. **(5+5=10)**

3(a) Differentiate $cos\sqrt{x}$ from the first principles.

(b) If $y = x^4 + 2x^2 + 2$ prove that $\frac{dy}{dx} = 4x\sqrt{y-1}$.

MCQs Ans Key

Q:1 (C) Q:2 (D) Q:3 (C) Q:4 (B) Q:5 (D) Q:6 (C)

TALEEM CITY INSTITUTE

Ameenpur, Faisalabad 03126987979

Name:		Roll#:		Class:	Inter Part-II
Subject:	Mathematics-12	Date:		Time:	
Test Type #	Type 7 - Short Test (No Choice) - Marks=30				
Test Syllabus:	2.7-2.10,				

Q.1 Circle the Correct Answers. **(6x1=6)**

i If $y = e^{2x}$ then y_4 equals:

(A) $16e^{2x}$ (B) $8e^{2x}$ (C) $2e^{2x}$ (D) e^{2x}

ii Maclaurin's Expansion of $ln(1+x)$ is:

(A) $x - \frac{x^3}{3!} + \frac{x^5}{5!} + \ldots$ (B) $1 - \frac{x^2}{2!} + \frac{x^4}{4!} + \ldots$ (C) $-x - \frac{x^2}{2!} + \frac{x^3}{3!} + \ldots$ (D) $-x - \frac{x^2}{2} - \frac{x^3}{3} + \ldots$

iii **The Taylor series is valid only if it is ----------.**

(A) convergent (B) divergent (C) increasing (D) decreasing

iv **f(*x*) is a decreasing function at *x*, if:**

(A) $f(x+\delta x) - f(x) > 0, when\, \delta x < 0$ (B) $f(x+\delta x) - f(x) > 0, when\, \delta x > 0$

(C) $f(x+\delta x) - f(x) < 0, when\, \delta x < 0$ (D) $f(x+\delta x) - f(x) = 0, when\, \delta x < 0$

v **Let f be a differentiable function on the interval (a , b). Then f is a\an ---------- on (a , b) if f ¢(x) < 0 for each x Î (a , b).**

(A) increasing (B) decreasing (C) maxima (D) minima

vi **Derivative of strictly increasing function is always:**

(A) zero (B) positive (C) negative (D) both (a) and (b)

Q.2 Write short answers of the following questions. **(7x2=14)**

i. Find y_2 if $y = x^2 e^{-x}$.

ii. Find y_2 if $x^3 - y^3 = a^3$.

iii. Find y_2 if $ln(x^2 - 9)$.

iv. Define power series.

v. Examine the function $f(x) = 1 + x^3$ for extreme values.

vi. Define stationary point.

vii. Find the lengths of sides of a variable rectangle having area $36cm^2$ when its perimeter is minimum.

NOTE: Attempt the long question. **(5+5=10)**

3(a) Find the point on the curve $y = x^2 - 1$ that is closest to the point(3,-1).

(b) Find the extreme values for the following functions defined as: $f(x) = x^4 - 4x^2$

MCQs Ans Key

Q:1 (A) Q:2 (D) Q:3 (A) Q:4 (A) Q:5 (B) Q:6 (B)

TALEEM CITY INSTITUTE

Ameenpur, Faisalabad 03126987979

Name:		Roll#:		Class:	Inter Part-II
Subject:	Mathematics-12	Date:		Time:	
Test Type #	Type 7 - Short Test (No Choice) - Marks=30				
Test Syllabus:	Unit-2,				

Q.1 Circle the Correct Answers. **(6x1=6)**

i If $y = \frac{(x+1)(x+2)}{(x+3)(x+4)}$, then $\frac{dy}{dx}$ equals:

(A) $\frac{(4x^2+20x+22)}{(x+3)(x+4)}$ (B) $\frac{(4x^2+20x+22)}{(x+3)^2(x+4)^2}$ (C) $\frac{(4x^2-22x-20)}{(x+3)^2(x+4)^2}$ (D) None of these

ii $\frac{d}{dx}(sec\,x)$ is equal to _____:

(A) $sec\,x\,tan\,x$ (B) $-sec\,x\,tan\,x$ (C) $sec^2\,x$ (D) $cosec^2 x$

iii $\frac{d}{dx}(cos\,x^2) =$_____:

(A) $2x\,sin\,x^2$ (B) $-2x\,sin\,x^2$ (C) $x\,sin\,x^2$ (D) $-x\,sin\,x^2$

iv $\frac{d}{dx}(e^{sin\,x})$ equals:

(A) $e^{sin\,x}.cos\,x$ (B) $-e^{sin\,x}.cos\,x$ (C) $e^{cos\,x}\,sin\,x$ (D) $-e^{cos\,x}\,sin\,x$

v If $f'(c) = 0$ and $f''(c) < 0$ then $f(c)$ will give at $x = c$:

(A) Maximum value (B) Minimum value

(C) Neither maximum nor minimum (D) stationary value

vi The critical value of $f(x) = x^2 - x - 2$ equals:

(A) $\frac{1}{2}$ (B) $-\frac{1}{2}$ (C) 2 (D) -2

Q.2 Write short answers of the following questions. **(7x2=14)**

i. Define implicit function also write one example.

ii. Find $\frac{dy}{dx}$, if $y^2 + x^2 - 4x = 5$.

iii. If $y = sin^{-1}\left(\frac{x}{a}\right)$, then find y_2.

iv. Find y_2 if $x^3 - y^3 = a^3$.

v. Expand $cos\,x$ by Maclaurin's series expansion.

vi. Define critical point.

vii. Find the interval for increasing and decreasing function $f(x) = cos\,x$ for $\left(\frac{-\pi}{2}, \frac{\pi}{2}\right)$.

NOTE: Attempt the long question. **(5+5=10)**

3(a) Differentiate $y = sin\sqrt{x}$ from the first principle.

(b) Show that $y = \frac{ln\,x}{x}$ has maximum value at $x = e$.

MCQs Ans Key

Q:1 (B) Q:2 (A) Q:3 (B) Q:4 (A) Q:5 (A) Q:6 (A)

TALEEM CITY INSTITUTE

Ameenpur, Faisalabad 03126987979

Name:		Roll#:		Class:	Inter Part-II
Subject:	Mathematics-12	Date:		Time:	
Test Type #	Type 7 - Short Test (No Choice) - Marks=30				
Test Syllabus:	3.1,3.2,3.3				

Q.1 Circle the Correct Answers. **(6x1=6)**

i The integration is the reverse process of:

(A) Induction (B) Differentiation (C) Tabulation (D) Sublimation

ii $\int sec\,x\,dx$ equals:

(A) $sec\,x\,tan\,x$ (B) $ln(sec\,x\,tan\,x)$ (C) $ln(sec\,x+tan\,x)$ (D) $ln(sec\,x-tan\,x)$

iii $\int sin\,3x\,dx$ is:

(A) $\frac{cos\,3x}{3}+c$ (B) $\frac{-cos\,3x}{3}+c$ (C) $3cos\,3x+c$ (D) $-3cos\,3x+c$

iv $\int \frac{ln\,x}{x}dx$ equals:

(A) $ln(ln\,x)$ (B) $\frac{(ln\,x)^2}{2}$ (C) $ln\,x$ (D) $\frac{ln\,x}{2}$

v $\int cosec^2x(ax+b)\,dx = \ldots\ldots, (a\neq 0)$

(A) $-\frac{1}{a}\,cot\,(ax+b)+c$ (B) cot (ax + b) + c

(C) cosec (ax + b) + c (D) - cosec (ax + b) cot (ax + b) + c

vi To integrate $\int \frac{dx}{x^2\sqrt{x^2+4}}\,dx$ we will make substitution:

(A) x = 2 tan q (B) x = 2 sec q (C) x = 2 cos q (D) None of these.

Q.2 Write short answers of the following questions. **(7x2=14)**

i. Find δy and dy if $y=x^2$; when $x=2$ and $dx=0.01$.

ii. Using differentials find $\frac{dx}{dy}$ in the following equations: $xy+x=4$

iii. Using differentials find $\frac{dx}{dy}$ in the following equations: $x^2+2y^2=16$

iv. Evaluate $\int sin^2x\,dx$.

v. Evaluate $\int cos\,3x\,sin\,2x\,dx$.

vi. Find $\int tan^2x\,dx$.

vii. Evaluate $\int \frac{sin\,\theta}{1+cos^2\theta}d\theta$.

NOTE: Attempt the long question. **(5+5=10)**

3(a) Use differentials to approximate the values of $(31)^{\frac{1}{5}}$.

(b) Evaluate $\int \sqrt{1+\sin x}\,dx,\ \left(-\frac{\pi}{2}<x<\frac{\pi}{2}\right)$.

MCQs Ans Key

Q:1 (B) Q:2 (C) Q:3 (B) Q:4 (B) Q:5 (A) Q:6 (A)

TALEEM CITY INSTITUTE

Ameenpur, Faisalabad 03126987979

Name:		Roll#:		Class:	Inter Part-II
Subject:	Mathematics-12	Date:		Time:	
Test Type #	Type 7 - Short Test (No Choice) - Marks=30				
Test Syllabus:	3.4-3.8				

Q.1 Circle the Correct Answers. **(6x1=6)**

i $\int_0^{\frac{\pi}{4}} sec^2 x\, dx =$ _____:

(A) 5 (B) 4 (C) 2 (D) 1

ii $\int_0^{\frac{\pi}{2}} K\, cos\, x\, dx = 4$ then k = _____:

(A) 5 (B) 4 (C) 2 (D) 0

iii If f is continuous on [a,b] and $\phi'(x) = f(x)$ then $\int_a^b f(x)dx =$:

(A) $\phi(a) - \phi(b)$ (B) $\phi(b) - \phi(a)$ (C) $\phi(a)$ (D) $\phi(b)$

iv **If $\int_a^b f(x)\, dx$, then the interval [a , b] is called the ---------- of integration.**

(A) domain (B) range (C) lower limit (D) upper limit

v $\int_a^b f(x)\, dx$ as the area under the curve y = f(x) from x = a to x = b and the x-axis is called:

(A) integration by parts (B) definite integral (C) differentiation (D) None of these

vi **The order of a differential equation y $\frac{dy}{dx}$ + 2x = 0 is:**

(A) 0 (B) 1 (C) 2 (D) None of these

Q.2 Write short answers of the following questions. **(7x2=14)**

i. Evaluate the following integrals: $\int \frac{5x^2+9x+6}{(x^2-1)(2x+3)} dx$

ii. State Fundamental theorem of calculus in definite integral.

iii. Evaluate the following definite integrals: $\int_{\frac{\pi}{6}}^{\frac{\pi}{2}} \frac{cos\, x}{sin\, x(2+sin\, x)} dx$

iv. Find The area between x-axis and curve $y = 5 - x^2$ from $x = -1$ to $x = 2$.

v. Define order of the differential equation with one example.

vi. Evaluate $\frac{dy}{dx} = \frac{y^2+1}{e^{-x}}$.

vii. Show that $y = cx - 1$, is the solution of differential equation $x\frac{dy}{dx} = 1 + y$.

NOTE: Attempt the long question. **(5+5=10)**

3(a) Evaluate $\int \sqrt{x^2+4}\, dx$.

(b) Evaluate $\int_0^{\frac{\pi}{4}} cos^4 t\, dt$.

MCQs Ans Key

Q:1 (D) Q:2 (B) Q:3 (B) Q:4 (B) Q:5 (B) Q:6 (B)

TALEEM CITY INSTITUTE

Ameenpur, Faisalabad 03126987979

Name:		Roll#:		Class:	Inter Part-II
Subject:	Mathematics-12	Date:		Time:	
Test Type #	Type 10 - Short Test (No Choice) - Marks=45				
Test Syllabus:	Unit-3,				

Q.1 Circle the correct answer. **(11x1=11)**

i $\int e^x dx$ is equal to:
(A) $xe^x + c$ (B) $xe^{x-1} + c$ (C) $e^{x-1} + c$ (D) $e^x + c$

ii $\int \frac{-1}{x\sqrt{x^2-1}} dx =$____:
(A) $tan^{-1}x + c$ (B) $cosec^{-1}x + c$ (C) $sec^{-1}x + c$ (D) $sin^{-1}x + c$

iii $\int x^{-1} dx =$____:
(A) $0 + c$ (B) $-x^{-2} + c$ (C) $\frac{x^{-2}}{0} + c$ (D) $ln\,x + c$

iv $\int \frac{x}{x+2} dx =$____:
(A) $ln(x+2) + c$ (B) $x + 2ln(x+2) + c$ (C) $x - 2ln(x+2) + c$ (D) $x - ln(x+2) + c$

v $\int sec^2 x\, dx = ...$
(A) tan x + c (B) - tan x + c (C) sec x tan x + c (D) - sec x tan x + c

vi $\int cos\, x\, dx = ...+c$
(A) cos x (B) - cos x (C) sin x (D) - sin x

vii $\int \frac{d}{dx}[f(x)]dx =$:
(A) f'(x)+c (B) $\frac{1}{2}[f(x)]^2 + c$ (C) f(x)+c (D) $\frac{1}{2}f(x) + c$

viii The area of the region, below the x-axis and under the curve y = f(x) from a to b is given by:
(A) $\int_a^b f(x)\, dx$ (B) $-\int_a^b f(x)\, dx$ (C) $-\int_b^a f(x)\, dx$ (D) None of these

ix **The arbitrary constants involving in the solution of different equations can be determined by the given condition. Such conditions are called ---------- condition.**
(A) initial values (B) general (C) boundary values (D) None of these

x If $\frac{dy}{dx} = 3x^2 - 4$, and y = 3 when x =2, then y = ?
(A) $x^3 - 4x$ (B) $x^3 + 4x + 3$ (C) $(x+1)(x^2 - x + 3)$ (D) $(x-1)(x^2 + x - 3)$

xi **An anti derivative of $3x^2 + \frac{8}{x^2}$ is:**
(A) $x^3 - \frac{8}{x}$ (B) $x^3 - \frac{4}{x}$ (C) $x^3 - \frac{16}{x}$ (D) $6x - \frac{8}{x}$

Q.2 Write short answers of the following questions. **(6x2=12)**

(i) Evaluate $\int e^{ax}\left[a\, sec^{-1} + \frac{1}{x\sqrt{x^2-1}}\right] dx.$ (ii) Evaluate $\int e^{2x}(-sin\, x + 2\, cos\, x)dx.$ (iii) Evaluate $\int x^4\, lnx\, dx$

(iv) Find The area between x-axis and curve $y = 5 - x^2$ from $x = -1$ to $x = 2$.

(v) Define differential equation and order of differential equation. (vi) Solve the differential equation $\frac{x^2+1}{y+1} = \frac{x}{y}\frac{dy}{dx}$.

Q.3 Write short answers of the following questions. **(6x2=12)**

(i) Evaluate $\int \frac{sin\,\theta}{1+cos^2\theta} d\theta.$ (ii) Find $\int tan^{-1}x\, dx.$ (iii) Write two properties of definite integration.

(iv) Find area bounded by the curve $y = 4 - x^2$ and x-axis.

(v) Find The area bounded by the curve $y = x^3 + 1$, the x-axis and the line $x = 2$. (vi) Solve $\frac{dy}{dx} = \frac{y}{x^2}$.

NOTE: Attempt a long question. **(5+5=10)**

4(a) Evaluate $\int_{-1}^{2}(x + |x|)dx.$

(b) Evaluate the following integrals: $\int \frac{x^2+3x-34}{x^2+2x-15} dx$

MCQs Ans Key

Q:1 (D)	Q:2 (B)	Q:3 (D)	Q:4 (C)	Q:5 (A)	Q:6 (C)
Q:7 (C)	Q:8 (B)	Q:9 (A)	Q:10 (D)	Q:11 (A)	

TALEEM CITY INSTITUTE

Ameenpur, Faisalabad 03126987979

Name:		Roll#:		Class:	Inter Part-II
Subject:	Mathematics-12	Date:		Time:	
Test Type #	Type 10 - Short Test (No Choice) - Marks=45				
Test Syllabus:	Unit-4,				

Q.1 Circle the correct answer. **(11x1=11)**

i Mid point of A(2,0), B(0,2) is:
(A) (0,2) (B) (2,0) (C) (2,2) (D) (1,1)

ii **x and y both are positive in:**
(A) first quadrant (B) second quadrant (C) third quadrant (D) fourth quadrant

iii **Distance of the point (x, y) from X-axis is:**
(A) x (B) y (C) $|x|$ (D) $|y|$

iv The vertices of a triangle are (a,b-c), (b,c-a), (c,a-b) then its centroid is:
(A) $\left(0, \frac{a+b+c}{3}\right)$ (B) $\left(0, \frac{a-b-c}{3}\right)$ (C) (0,0) (D) $\left(\frac{a+b+c}{3}, 0\right)$

v If a line passes through $A(x_1, y_1)$ and $B(x_2, y_2)$, then its slope is:
(A) $\frac{y_2-y_1}{x_2-x_1}$ (B) $-\frac{y_2-y_1}{x_2-x_1}$ (C) $\frac{x_2-x_1}{y_2-y_1}$ (D) $-\frac{x_2-x_1}{y_2-y_1}$

vi The point (x_1, y_1) lies above the line ax + by + c = 0 if:
(A) $ax_1 + by_1 + c < 0, b < 0$ (B) $ax_1 + by_1 + c > 0, b < 0$ (C) $ax_1 + by_1 + c = 0, b > 0$
(D) $ax_1 + by_1 + c < 0, b > 0$

vii **For all values of a and b the line (a + b)x + (a - b)y = 2a + 3b passes through the fixed point.**
(A) **no such point** (B) **(5/2, 1/2)** (C) **(5/2, - 1/2)** (D) **None of these**

viii Two lines $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ will intersect if:
(A) $a_1 b_2 - a_2 b_1 = 0$ (B) $a_1 b_2 - a_2 b_1 \neq 0$ (C) $a_1 a_2 - b_1 b_2 = 0$ (D) $a_1 a_2 - b_1 b_2 \neq 0$

ix Slope of the line passing through the points (-1,3),(2,-1) is:
(A) $-\frac{8}{3}$ (B) $-\frac{3}{8}$ (C) $\frac{3}{8}$ (D) $\frac{8}{3}$

x Equation of a non vertical line with slope m and y intercept zero is:
(A) y=x (B) y=mx (C) y=mx+c (D) y=0

xi If the slopes of two lines are $\frac{1}{2}$ and 3, then the measure of angle from 1st line to 2nd line is:
(A) π (B) $\frac{\pi}{3}$ (C) $\frac{\pi}{2}$ (D) $\frac{\pi}{4}$

Q.2 Write short answers of the following questions. **(6x2=12)**

(i) Find the distance between points A(3,1) ; B(-2,-4).
(ii) Describe the location in the plane of the point P(x,y) for which $|x| \geq 3$.
(iii) The points A(-5, -2) and B(5,-4) are ends of a diameter of circle. Find centre and radius of the circle.
(iv) Describe the location in the plane of the point P(x,y) for which $|x| = -|y|$
(v) Find the distance between the parallel lines $3x - 4y + 3 = 0$ and $3x - 4y + 7 = 0$.
(vi) Find K so that the line joining A (7,3), B(K,-6), and the line joining C(-4, 5), D(-6, 4) are parallel.

Q.3 Write short answers of the following questions. **(6x2=12)**

(i) Find the coordinates of the point that divides join of A(-6,3) and B(5,-2) in ratio 2:3 externally.
(ii) The xy-coordinate axes are translated through the the point O' whose coordinates are given in xy-coordinate. The coordinates of P are given in the XY-coordinate system. Find the coordinates of P in xy-coordinate system.
$P(8, 10); O'(3, 4)$
(iii) The xy-coordinate axes are translated through the the point O' whose coordinates are given in xy-coordinate. The coordinates of P are given in the XY-coordinate system. Find the coordinates of P in xy-coordinate system.
$P(4, -3); O'(-2, 3)$
(iv) Find an equation of vertical line through (-5,3).
(v) Find equation of line through (-4,-6) and perpendicular to the line having slope $-\frac{3}{2}$.
(vi) By means of slopes show the points lie on the same line A(-1,-3), B(1,5), C(2,9).

NOTE: Attempt a long question. **(5+5=10)**

4(a) The vertices of a triangle are A(-2,3), B(-4,1) and C(3,5). Find coordinates of the orthocentre. Are these three points collinear?

(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.

MCQs Ans Key

Q:1 (D)	Q:2 (A)	Q:3 (D)	Q:4 (D)	Q:5 (A)	Q:6 (A)
Q:7 (C)	Q:8 (B)	Q:9 (A)	Q:10 (B)	Q:11 (D)	

TALEEM CITY INSTITUTE

Ameenpur, Faisalabad 03126987979

Name:		Roll#:		Class:	Inter Part-II
Subject:	Mathematics-12	Date:		Time:	
Test Type #	Type 10 - Short Test (No Choice) - Marks=45				
Test Syllabus:	Unit-5,				

Q.1 Circle the correct answer. **(11x1=11)**

i (2,1) is in the solution of inequality:
(A) 2x + y > 0 (B) x - y > 1 (C) 3x + 5y < 7 (D) $2x + y \geq 6$

ii Which one satisfies the equality $x + 2y < 6$?
(A) (4,1) (B) (1,3) (C) (1,4) (D) (3,1)

iii The inequality $2x + 3y < 5$ is:
(A) (1,1) (B) (-2, 1) (C) (1,2) (D) (-2,3)

iv **x = c is a vertical line parallel to ----------.**
(A) x-axis (B) y-axis may be (C) y-axis (D) None of these

v The inequality x < a is the open half plane to the --------- of the boundary line x = a.
(A) above (B) left (C) below (D) right

vi **The linear equation ---------- is called the associated or corresponding equation of the inequality ax + by £ c.**
(A) ax + by > c (B) ax + by = c (C) ax + by < c (D) ax + by ³ c

vii **x = a is a vertical line perpendicular to ----------.**
(A) x-axis (B) x-axis may be (C) y-axis (D) None of these

viii **For different values of k, the equation 4x + 5y = k represents lines ---------- to the line 4x + 5y = 0.**
(A) perpendicular (B) parallel (C) equal (D) None of these

ix **The ordered pair ------- is a solution of the inequality x + 2y < 6.**
(A) (3 , 3) (B) (1 , 1) (C) (4 , 4) (D) None of these

x **y = b is a horizontal line perpendicular to ----------.**
(A) x-axis (B) y-axis may be (C) y-axis (D) None of these

xi **A point does not lie in the feasible region is --------- corner point of the feasible region.**
(A) a (B) may be a (C) not a (D) None of these

Q.2 Write short answers of the following questions. **(6x2=12)**

(i) Describe Solution Region. (ii) Shade the feasible region of $4x - 3y \leq 12$.
(iii) Graph the feasible region of the following inequality $2x - 3y \leq 6$. (iv) Define convex region.
(v) Define convex and feasible region. (vi) Find the corner point of inequalities: $x + y \leq 5, -2x + y \leq 2, x \geq 0, y \leq 0$

Q.3 Write short answers of the following questions. **(6x2=12)**

(i) Graph the solution set of linear inequalities xy-plane $x + y \geq 5$; $-y + x \leq 1$
(ii) Graph the solution region of linear inequalities. $x + y \leq 5, y - 2x \leq 2$.
(iii) Define half planes and boundary fo half planes. (iv) Define decision variables. (v) Define objective function.
(vi) State the theorem of linear programming.

NOTE: Attempt a long question. **(5+5=10)**

4(a) Graph the feasible region and find the corner points x+3y≤15, 2x+y≤12, x≥0,y≥0.

(b) Graph the feasible region of the following system of linear inequalities and find the corner points in each case:
$2x + y \leq 20$; $8x + 15y \leq 120$; $x + y \leq 11$; $x \geq 0, y \geq 0$

MCQs Ans Key

Q:1 (A)	Q:2 (D)	Q:3 (B)	Q:4 (C)	Q:5 (B)	Q:6 (B)
Q:7 (A)	Q:8 (B)	Q:9 (B)	Q:10 (B)	Q:11 (C)	

TALEEM CITY INSTITUTE

Ameenpur, Faisalabad 03126987979

Name:		Roll#:		Class:	Inter Part-II
Subject:	Mathematics-12	Date:		Time:	
Test Type #	Type 10 - Short Test (No Choice) - Marks=45				
Test Syllabus:	Unit-6,				

Q.1 Circle the correct answer. **(11x1=11)**

i Equation of circle with centre at origin and radius $\sqrt{5}$ is:
(A) $x^2+y^2=\sqrt{5}$ (B) $x^2+y^2=5$ (C) $x^2+y^2=25$ (D) $x^2-y^2=5$

ii If the cutting plane is parallel to the axis of the cone and intersects both of its nappes, then the section is a\an:
(A) parabola (B) hyperbola (C) ellipse (D) None of these

iii If r is the radius of any circle and c its centre, then any point $P(x_1, y_1)$ lies on the circle only if:
(A) |CP| < r (B) |CP| > r (C) |CP| = r (D) None of these

iv Focal distance of Point (x,y) on $x^2 = 4ay$ is:
(A) x + a (B) y + a (C) x - a (D) y - a

v Parabola having equation $x^2 = 4ay$ opens:
(A) Towards left (B) Towards right (C) Upwards (D) Downwards

vi A chord passing through the focus of a parabola is called a --------- of the parabola.
(A) directrix (B) latus rectum (C) focus (D) focal chord

vii If the equation of the parabola is to x^2 = 4ay, then opening of the parabola is to ---------- of the x-axis.
(A) left (B) upward (C) right (D) downward

viii The graph of the parabola x^2 = - 4ay lies in quadrants.
(A) I and II (B) III and IV (C) II and III (D) I and IV

ix The directrix of the parabola x^2 = - 4ay is:
(A) x = a (B) x = - a (C) y = a (D) y = - a

x The co-ordinates of vertices of hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ equals:
(A) $(0,\pm b)$ (B) $(\pm b,0)$ (C) $(0,\pm a)$ (D) $(\pm a,0)$

xi _____ are tangent to $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ for all values of m.
(A) $y=mx\pm\sqrt{a^2m^2+b^2}$ (B) $y=mx\pm\sqrt{a^2m^2-b^2}$
(C) $y=mx\pm\sqrt{b^2-a^2m^2}$ (D) None of these

Q.2 Write short answers of the following questions. **(6x2=12)**

(i) Find the length of the tangent from the point p(-5,10) to the circle $5x^2+5y^2+14x+12y-10=0$.
(ii) Derive standard equation of Parabola.
(iii) Find equation of the parabola whose focus is F(-3,4) and directrix is $3x-4y+5=0$.
(iv) Write uses of parabola in suspension bridge. (v) Find equations of the normal to $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$
(vi) Find an equation of each of the following with respect to new parallel axes obtained by shifting the origin to the indicated point: $x^2-y^2+4x+8y-11=0,\ O'(-2,4)$

Q.3 Write short answers of the following questions. **(6x2=12)**

(i) Find the centre and radius of the circle given by the equation $4x^2+4y^2-8x+12y-25=0$.
(ii) Write general form of an equation of a circle and coordinates of centre. (iii) Define focal chord of Parabola.
(iv) Define vertex of Parabola. (v) Find equations of the tangent to $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$
(vi) Show that the product of the distances from the foci to any tangent to the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ is constant.

NOTE: Attempt a long question. **(5+5=10)**

4(a) Find equations of the common tangents to the given conic $9x^2-4y^2=36$ parallel to $5x-2y+7=0$
(b) Write down equations of the tangent and normal to the circle $4x^2+4y^2-16x+24y-117=0$ at the points on the circle whose abscissa is -4.

MCQs Ans Key

Q:1 (B)	Q:2 (B)	Q:3 (C)	Q:4 (A)	Q:5 (C)	Q:6 (D)
Q:7 (D)	Q:8 (B)	Q:9 (C)	Q:10 (D)	Q:11 (B)	

TALEEM CITY INSTITUTE

Ameenpur, Faisalabad 03126987979

Name:		Roll#:		Class:	Inter Part-II
Subject:	Mathematics-12	Date:		Time:	
Test Type #	Type 10 - Short Test (No Choice) - Marks=45				
Test Syllabus:	Unit-7,				

Q.1 Circle the correct answer. **(11x1=11)**

i **A scalar quantity, is one that possesses only:**
(A) **magnitude** (B) **direction** (C) **both a and b** (D) **None of these**

ii **Two vectors are said to be equal, if they have ---------- magnitude and ---------- direction.**
(A) **same, same** (B) **opposite, same** (C) **same, opposite** (D) **opposite, opposite**

iii $\underline{a}$ and $\underline{b}$ are perpendicular if:
(A) $\underline{a} \times \underline{b} = 0$ (B) $\underline{a}.\underline{b} = 0$ (C) $\underline{a} = \underline{b}$ (D) $\underline{a} = -\underline{b}$

iv If vectors $2\hat{i} + \hat{j} + \hat{k}$ and $\hat{i} - 4\hat{j} + \alpha\hat{k}$ are perpendicular, then $\alpha =$:
(A) 1 (B) 2 (C) 3 (D) 4

v If $\vec{a}.\vec{b} = \vec{b}.\vec{c} = \vec{c}.\vec{a} = 0$, then $\vec{a}.(\vec{b} \times \vec{c})$ is equal to:
(A) $|\vec{a} \times \vec{b} \times \vec{c}|$ (B) $|\vec{a}| + |\vec{b}| + |\vec{c}|$ (C) $|\vec{a}|\,|\vec{b}|\,|\vec{c}|$ (D) None of these

vi **The dot product of unit vector $\underline{k}$ with unit vector $\underline{i}$ is:**
(A) 0 (B) 2 (C) 1 (D) 3

vii $\vec{j} \times \vec{k} =$_____:
(A) $\vec{i}$ (B) $-\vec{i}$ (C) 1 (D) 0

viii $\underline{j} \times \underline{j} =$
(A) 0 (B) $\underline{j}$ (C) $\underline{i}$ (D) $\underline{k}$

ix $[\underline{a}\ \underline{b}\ \underline{c}]$ is equal to:
(A) 1 (B) $\underline{a}$ (C) 0 (D) $\underline{b}$

x The moment of a force $\vec{F}$ acting at P about C is:
(A) $\vec{F} \times \overrightarrow{cp}$ (B) $\overrightarrow{cp}.\vec{F}$ (C) $\overrightarrow{cp}.\overrightarrow{F}$ (D) $\overrightarrow{cp} \times \overrightarrow{F}$

xi If d is the displacement and F is the applied force, then work done by F is equal to:
(A) $\underline{F} + \underline{d}$ (B) $\underline{F}.\underline{d}$ (C) $\underline{F} \times \underline{d}$ (D) $\underline{F} - \underline{d}$

Q.2 Write short answers of the following questions. **(6x2=12)**

(i) Find a unit vector in the direction of vector $\underline{v} = \frac{1}{2}\underline{i} + \frac{\sqrt{3}}{2}\underline{j}$. (ii) Define length or norm of a vector.

(iii) Define parallel vectors. (iv) Find direction cosines of $\underline{v} = \underline{i} - \underline{j} - \underline{k}$.

(v) Find the cosine of the angle θ between $\underline{u}$ and $\underline{v}$: $\underline{u} = [2, -3, 1]$, $\underline{v} = [2, 4, 1]$

(vi) Prove that $sin(\alpha - \beta) = sin\,\alpha\, cos\,\beta - cos\,\alpha\, sin\,\beta$.

Q.3 Write short answers of the following questions. **(6x2=12)**

(i) Find position vector of a point which divide the join of E with position vector $5\underline{i}$ and F with position vector $4\underline{i} + \underline{j}$ in the ratio 2:5.

(ii) Define negative vector. (iii) Define parallelogram law of addition.

(iv) Find the direction cosines for $\overrightarrow{PQ}$, where P(2,1,5), Q(1,3,1). (v) Let A=(2,5), B=(-1,1) and C(2,-6). Find $\overrightarrow{AB}$

(vi) A force of magnitude 6 units acting parallel to $2\underline{i} - 2\underline{j} + \underline{k}$ displaces the point of application from (1,2,3) to (5,3,7). Find the work done.

NOTE: Attempt a long question. **(5+5=10)**

4(a) Give a force $\underline{F} = 2\underline{i} + \underline{j} - 3\underline{k}$ acting at a point A(1,-2,1). Find the moment of $\underline{F}$ about the point B(2,0,-2).

(b) If $\underline{a} = 4\underline{i} + 3\underline{j} + \underline{k}$ and $\underline{b} = 2\underline{i} - \underline{j} + 2\underline{k}$. Find a unit vector perpendicular to both $\underline{a}$ and $\underline{b}$. Also find the sine of angle between the vectors $\underline{a}$ and $\underline{b}$.

MCQs Ans Key

Q:1 (A)	Q:2 (A)	Q:3 (B)	Q:4 (B)	Q:5 (C)	Q:6 (A)
Q:7 (A)	Q:8 (A)	Q:9 (C)	Q:10 (B)	Q:11 (B)	