INTERNATIONAL INDIAN SCHOOL, DAMMAM

FIRST TERMINAL EXAMINATIONS, JUNE-2012

SET-B

GRADE: XI **Max Marks-100**

SUBJECT: MATHEMATICS **Time – 3 hours**

General Instructions

1. All questions are compulsory.

2. the question paper consists of 29 questions divided into three sections A, B, C

3, Section A contains 10 questions of 1 mark each, section B contains 12 questions of 4 marks each and section C contains 7 questions of 6 marks each.

SECTION-A (10X1=10 Marks)

1) If R is the set of real numbers and Q is the set of rational numbers, then what is R – Q?
2) If power set of the set A have 32 elements, then how many elements A have?
3) Find the value of $\cot\frac{19\pi}{3}$
4) Find radian measure of $40^0 20'$
5) If n (A) = m and n (B) = n, then how many relations are possible from set A to set B.
6) Evaluate $\lim_{x\to 0}\frac{5\tan 5x}{x}$
7) Find the principal solutions of sec x = -2
8) Find multiplicative inverse of 2 + 3i
9) If f(x) = $x^2 - 1$ and g(x) = 2x + 3,find (fg)(x)
10) Find modulus of $\frac{1}{1-i}$

SECTION-B (12X4 = 48 Marks)

11) Solve the following inequality $6 \leq -3(2x - 4)$ 12

(Type text)

$(A \cup B)' = A' \cap B'$ and $(A \cap B)' = A' \cup B'$

13) If $f(x) = \frac{1-x^2}{1+x^2}$, show that $f(\tan\theta) = \cos 2\theta$

14) If $(x + iy)^3 = u + iv$, then show that $\frac{u}{x} + \frac{v}{y} = 4(x^2 - y^2)$

15) Prove in ΔABC, $\frac{b^2-c^2}{a^2} = \frac{\sin(B-C)}{\sin(B-C)}$

16) If P (A) = P (B), then prove that A = B.

17) Draw the graph of the following function

$$f(x) = \begin{cases} 1 - X, & x < 0 \\ 1, & x = 0 \\ x + 1, & x > 0 \end{cases}$$

18) Solve the following equation: $\tan^2 x + (1 - \sqrt{3})\tan x - \sqrt{3} = 0$

19) Find square root of (-5 + 12i)

OR

Convert $\frac{-16}{1+i\sqrt{3}}$ into polar form.

20) If A = { 1,2,3} , B = { 2,3,3 } & C = { 4,5 }, verify that

A X (B U C) = (A X B) U (A X C) & A X (B – C) = (A X B) – (A X C)

21) Evaluate $\lim_{x\to 0} \frac{\cos 2x - 1}{\cos 2x + 1}$

22) Prove that $\frac{\sin^2 A - \sin^2 B}{\sin A \cos A - \sin B \cos B} = \tan(A + B)$

OR

Show that $\tan 3x \tan 2x \tan x = \tan 3x - \tan 2x - \tan x$

OR

If $\tan x = -\frac{4}{3}$ (X lies in 2nd quadrant), find $\sin\frac{x}{2}$, $\cos\frac{x}{2}$ & $\tan\frac{x}{2}$

25) Solve graphically: $2x+y\geq 4$; $x+y\leq 3$; $2x-3y\leq 6$; $x\geq 0$; $y\geq 0$

26) Solve the following quadratic equation:

$X^2 - (7 - i)x + (18 - i) = 0$

27) (i) Find the domain of the following function : $f(x) = \frac{x^2+2x+1}{x^2-8x+12}$

(ii) Find domain & range of - $f(x) = \frac{3-x}{x-3}$

28) (i) Find derivative of $\frac{x^2 cosx}{sinx}$

(ii) Find derivative of sin 2x by first principle.

29) In a class of 60 students, 23 plays Volleyball, 15 plays Basketball, 20 play Football, 7 play Volleyball & Basketball, 5 play Football & Basketball, 4 play Volleyball & Football, 15 students do not play any game, find

(i) How many play all three games?

(ii) How many play only Football?

(iii) How many play Volleyball & Football but not Basketball?

INTERNATIONAL INDIAN SCHOOL, DAMMAM

FIRST TERMINAL EXAMINATIONS, JUNE-2012

SET-A

GRADE: XI **Max Marks-100**

SUBJECT: MATHEMATICS **Time – 3 hours**

General Instructions

1. All questions are compulsory.

2. the question paper consists of 29 questions divided into three sections a, B, C

3, Section A contains 10 questions of 1 mark each, section B contains 12 questions of 4 marks each and section C contains 7 questions of 6 marks each.

SECTION-A (10X1=10 Marks)

1) If R is the set of real numbers and Q is the set of rational numbers, then what is R – Q ?
2) If power set of the set A have 16 elements, then how many elements A have?
3) Find the value of $\tan\frac{19\pi}{3}$
4) Find radian measure of $36^0 18'$
5) If n (A) =3 and n (B) = 2, then how many relations are possible from set A to set B.
6) Evaluate $\lim_{x\to 0}\frac{5\sin 5x}{x}$
7) Find the principal solutions of cosec x = -2
8) Find multiplicative inverse of 2 – 3i
9) If f(x) = x^2 and g(x) = 2x + 1,find (fg)(x)
10) Find modulus of $\frac{1}{1+i}$

SECTION-B (12X4 = 48 Marks)

11) If P (A) = P (B), then prove that A = B.

12) Find square root of (-5 + 12i)

OR

Convert $\frac{-16}{1+i\sqrt{3}}$ into polar form.

13) Let U = { 1,2,3,4,5,6,7,8,9 } , A = {2,4,6,8 } & B = {2,3,5,7 }, verify that (AU B)' = A' ∩ B' and (A ∩ B)' = A'U B'

14) Draw the graph of the following function

$$f(x) = \begin{cases} 1 - X, & x < 0 \\ 1, & x = 0 \\ x + 1, & x > 0 \end{cases}$$

15) If $f(x) = \frac{1-x^2}{1+x^2}$, show that $f(\tan\theta) = \cos 2\theta$

16) Solve the following inequality $6 \leq -3(2x - 4)$ 12

17) Prove in ΔABC, $\frac{b^2-c^2}{a^2} = \frac{\sin(B-C)}{\sin(B-C)}$

18) Evaluate $\lim_{x\to 0} \frac{\cos 2x-1}{\cos 2x+1}$

19) If A = { 1,2,3} , B = { 2,3,3 } & C = { 4,5 }, verify that

A X (B U C) = (A X B) U (A X C) & A X (B – C) = (A X B) – (A X C)

20) If $(x + iy)^3 = u + iv$, then show that $\frac{u}{x} + \frac{v}{y} = 4(x^2 - y^2)$

21) Prove that $\frac{sin^2A-sin^2B}{sinAcosA-sinBcosB} = \tan(A + B)$

OR

Show that $\tan 3x \tan 2x \tan x = \tan 3x - \tan 2x - \tan x$

22) Solve the following equation: $tan^2x + (1 - \sqrt{3})tanx - \sqrt{3} = 0$

SECTION-C (7 X 6 = 42 Marks)

23) Prove that $\frac{sin3x+sin5x+sin7x+sin9x}{cos3x+cos5x+cos7x+cos9x} = tan6x$

24) In any ΔABC, prove that

$(b^2 - c^2)\cot A + (c^2 - a^2)\cot B + (a^2 - b^2)\cot C = 0$

SECTION-C (7 X 6 = 42 Marks)

23) In any ΔABC, prove that

$(b^2- c^2)\cot A + (c^2 – a^2)\cot B + (a^2 – b^2)\cot C = 0$

OR

If $\tan x = -\frac{4}{3}$ (X lies in 2nd quadrant) , find $\sin\frac{x}{2}$, $\cos\frac{x}{2}$ & $\tan\frac{x}{2}$

24) Prove that $\frac{sin3x+sin5x+sin7x+sin9x}{cos3x+cos5x+cos7x+cos9x} = tan6x$

25) (i) Find the domain of the following function : $f(x) = \frac{x^2+2x+1}{x^2-8x+12}$

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(iii) How many play Volleyball & Football but not Basketball?

27) Solve graphically: $2x+y\geq 4$; $x+y\leq 3$; $2x-3y\leq 6$; $x\geq 0$; $y\geq 0$

28) Solve the following quadratic equation:

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29) (i) Find derivative of $\frac{x^2 cosx}{sinx}$

(ii) Find derivative of sin 2x by first principle.