FAISALABAD BOARD 2015

PAPER MATHEMATICS PART-I

Time: 30 Mk (014edire Port)

;larks: 20

Note: Four Answers are given against each column A,B,C&D. Select the write answer and only separet answer sheet, fill the circle A,B,C or D with pen or marker in front of that question number.

1. If n is prime number, Then $\sqrt{n}$ is:

(a) Natural number

(b) Integers

(c) Rational number

(d) Irrational number

2. Set of integers is a group with respect to:

(a) +

(b) $÷$

(c) x

(d) -

3. Tabular form of {χ|χ$\in $ p ˄ χ >12}

(a) {1, 2, 3, 5, 7, 11}

(b) {2, 3, 5, 7, 9, 11}

(c) {2, 3, 7, 11}

(d) {2, 3, 5, 7, 11}

4. The cofactor of an element aμ denoted by Aμ:

(a) (-1)μ Mij

(b) (-1)1-j Mij

(c) (-1)1+j Mij

(d) (1)1+j Mij

5. If A and B are non-singular matrices, then (AB)-1 =:

(a) $\frac{1}{AB}$

(b) B-1A-1

(c) A-1B-1

(d) AB

6. An equation 16(x4 +1)- 8(x3 + x)+ 9x2 =0 is of the form:

(a) Exponential

(b) Radical

(c) Rational

(d) Reciprocal

7. If $ω$ is the imaginary cube roots of unity then

(a) $ω$

(b) $ω^{-1}$

(c) $\frac{1}{ω^{2}}$

(d) $ω^{3}$

8. Partial fraction of $\frac{χ^{2}+1}{χ^{3}+1}$ is:

(a) $\frac{A}{χ+1}+\frac{B}{χ^{2}+χ+1}$

(b) $\frac{A}{χ+1}+\frac{Bχ+C}{χ^{2}-χ+1}$

(c) $\frac{A}{χ+1}+\frac{Bχ+C}{χ^{2}+χ+1}$

(d) $\frac{A}{χ+1}+\frac{Bχ+C}{χ^{2}-χ-1}$

9. If A, G and H are arithmetic, goemetric and harmonic Means, then $\frac{G}{H}$

(a) $\frac{A}{G}$

(b) $\frac{G}{A}$

(c) $\frac{H}{G}$

(d) G2

10. If a, A, b are in A.P., then 2A=:

(a) $\frac{a + b}{2}$

(b) a + b

(c) 2(a + b)

(d) a - b

11. When P(A∩B) = P(A)P(B) then A and B are events

(a) Mutually exclusive

(b) Equally likely

(c) Independent

(b) Dependent

12. n Cn=

(a) 0

(b) 1

(c) n

(d) n!

13. Sum of coefficient in the expansion of (1+x)5 is:

(a) 8

(b) 16

(c) 32

(d) 64

14. Cos2 3$θ$+ sin2 3$θ$=:

(a) 1

(b) 2

(c) 3

(d) 4

15. 2nd term in (1-x)-r is:

(a) 1

(b) x

(c) 2x

(d) 3x

16. sin 2a

(a) $\frac{2tan α}{1-tan^{2}a}$

(b) $\frac{2tan α}{1+tan^{2}a}$

(c) $\frac{1+tan^{2} α}{1-tan^{2}a}$

(d) $\frac{tan α}{1+tan^{2}a}$

17. Rang of sin X is

(a) (-1 ,1)

(b) ( -1, 1)

(c) $\left[-1, 1\right]$

(d) (-1, 1]

18. lf a= 90° then:

(a) c2 = a2 + b2

(b) b2 = a2 + c2

(c) c2 = b2 + c2

(d) a2 = b2 + c2

19. tan (tan-1(1))=.

(a) 1

(b) $\frac{π}{4}$

(c) $\frac{π}{3}$

(d) 0

20. sin x = $\frac{1}{2}$ then x is:

(a) $\frac{π}{6},\frac{5π}{6}$

(b) $\frac{π}{3},\frac{5π}{3}$

(c) $\frac{π}{6},\frac{π}{3}$

(d) $\frac{π}{3},\frac{5π}{6}$

Time: 2:30 Hours

(Subjective Part)

SECTION-I

2. Attempt any Eight Parts,

1. Separate real and imaginary parts of $\frac{2-7i}{4+5i}$
2. Find multiplicative inverse of -3 -5i.
3. Define complement of a set.
4. Write the converse and inverse of $\~$ p $\rightarrow $ q.
5. For A = (I, 2, 3, 4), find the relation
6. if a,b are elements of a group G, then show that (ab)-1=b-1 a-1
7. find X and y if
8. lf A and B are matrices of same order, then explain why in general 



1. Show that a



1. Evalutate,
2. If a,$β$ are the roots of 3x2 - 2x+4= 0, then and the value of $\frac{a}{β}+\frac{β}{a}$
3. When x4 + 2x3 + kx2 + 3 is divided by x - 2, the remainder is 1. Find the value of k.

3. Attempt any Eight Parts, 16

1. Resolve in to partial fractions
2. If an-2=3n-11 , find nth terms of sequence
3. Find A.M. between 1 – χ+χ2 and 1+ x+ x2.
4. Find the 5th term of G.P.3,6,12,…..
5. Find nth term of
6. Evaluate:
7. Find the value of n when 11 Pn=11.10.9 .
8. Evaluate: 11C4.
9. Determine the probaility of getting 2 heads in two successive tosses of a balanced coin.
10. Show that $\frac{n^{3}+2n}{3}$ represent an integer for n = 1,2.
11. Calculate by means of binomial theorem (2.02)4
12. Expand up to 4 terms

4. Attempt any Eight Parts, 16

1. Prove that
2. Prove that sec2 $θ$-cosec2 $θ$= tan2$θ$- cot2$θ$
3. If a, $β$, $γ$ are angles of a triangle ABC then prove that tan (a + $β)$+ tan $γ$=0
4. Show that cos (a + $β$)cos (a- $β$)= cos2$ β$ –sin2 a,
5. Prove that cot a- tan a = 2 cot 2a .
6. Express sin 5x + sin 7 x as a product.
7. Find the period of cosec 10x.
8. Find the smallest angle of the triangle ABC when a = 37.34, b 3.24, c = 35.06.
9. Find the area of the triangle ABC when a = 200, b =120, $γ$ =150°
10. Find r2 of the triangle ABC, when a = 34, b = 20, c 42.
11. Without using calculator, show that cos-1 $\frac{4}{5}$ cot-1 $\frac{4}{3}$.
12. Find the solution of sin x = $\frac{\sqrt{3}}{2}$ which lies in $\left[0,2π\right]$
13. Solve: sec2 $θ$=$\frac{4}{3}$ in $\left[0,2π\right]$

SECTION-II

Attempt any THREE question each question carries 10 marks

5. (a) Use Cramer's rule to solve the system.

 (b) If a,$β$ are the roots of x2-3x+5=0 form the equation whose roots are $\frac{1-a}{1+a}$ and $\frac{1-β}{1+β}$

6. (a) Resolve into partial fractions $\frac{x^{4}}{1-x^{4}}$

I (b) Show that the sum of n A.Ms between a and b is equal to n times their A.M.

7. (a) Show that 16C11+16C10=17C11

 (b) Find the term independent of x in the expression of $\left(x-\frac{2}{x}\right)$10

8. (a) Prove that $\frac{tan θ+secθ-1}{tanθ-secθ+1}$= tan $θ+secθ$ .

 (b) If sin a = $\frac{4}{5}$ and cos $β$ = $\frac{40}{41}$ where 0 < a < $\frac{π}{2}$ and 0 < $β$ < $\frac{π}{2}$ show that sin(a - $β$)= $\frac{133}{205}$.

9. (a) Prove that

 (b) Prove that