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Lahore Board - Annual 2007 Group II
Mathematics Paper-I(Obj), Time Allowed: 30 Mints
Max. Marks: 20 , Available online @ http://www.mathcity.org/fsc

Q.1 Four possible answers to each statement are given below. Tick (✓) the correct answer

(i) If n is a prime number, then $\sqrt{n}$ is

(a) Real number (b) Rational number (c) Irrational number (d) Complex number

(ii) $p \wedge q$ represents

(a) Disjunction (b) Conjunction (c) Conditional (d) Quantifier

(iii) $(AB)^{-1} =$

(a) AB (b) BA (c) $A^{-1}B^{-1}$ (d) $B^{-1}A^{-1}$

(iv) A Homogenous system of linear equation has:

(a) Finite Solution (b) Unique Solution (c) Infinite Solution (d) Two Solution

(v) Sum of four roots of unity is:

(a) 1 (b) -1 (c) 0 (d) I

(vi) Equation having same solution is called:

(a) Exponential equation (b) Radical equation (c) Simultaneous equation (d) Reciprocal equation

(vii) The partial fraction of $\frac{1}{(x^2-1)}$ are of type

(a) $\frac{A}{(x+1)}+\frac{B}{(x-1)}$ (b) $\frac{A}{(x-1)}+\frac{B}{(x-1)^2}$ (c) $\frac{A}{(x+1)}+\frac{B}{(x+1)^2}$ (d) $\frac{A}{(x-1)}+\frac{B}{(x-1)}$

(viii) If in an A.P $a_n = \frac{n}{2n+1}$, then a_4 is equal to:

(a) 4 (b) 3 (c) $\frac{4}{3}$ (d) $\frac{4}{9}$

(ix) Geometric mean between 2 and 8 is:

(a) 2 (b) 8 (c) 4 (d) 16

(x) $\sum_{k=1}^{n} k =$:

(a) nk (b) $\frac{n(n+1)}{2}$ (c) $\frac{k(k+1)}{2}$ (d) k^n

(xi) If A and B are disjoint event, then $P(A \cup B) =$

(a) $P(A)+P(B)$ (b) $P(A)+P(B)-P(A \cup B)$ (c) $P(A)+P(B)-P(A \cap B)$ (d) $P(A)-P(B)$

(xii) 0! is equal to:

(a) 0 (b) 1 (c) 10 (d) 100

(xiii) Expansion of $(8-2x)^{-1}$ is valid if :

(a) $|x|>4$ (b) $|x|<4$ (c) $|x|=0$ (d) $|x|=4$

(xiv) θ° is measured in:

(a) Circular system (b) Sexagesimal system (c) Radian measure (d) Rotation measure

(xv) Sum of all angles in a triangle is equal to:

(a) 90^0 (b) 180^0 (c) 270^0 (d) 360^0

(xvi) Period of $Sin3x$ is:

(a) 3π (b) 2π (c) $\frac{\pi}{3}$ (d) $\frac{2\pi}{3}$

(xvii) Angle below the surface line is called angle of:

(a) Right angle (b) Oblique angle (c) Depression (d) Elevation

(xviii) The greatest angle is opposite to:

(a) Smallest side (b) Greatest side (c) Same side (d) Right side

(xix) $Tan^{-1}A-Tan^{-1}B=$

(a) $Tan^{-1}\frac{AB}{1+AB}$ (b) $Tan^{-1}\frac{A-B}{1+AB}$ (c) $Tan^{-1}\frac{A-B}{1-AB}$ (d) $Tan^{-1}\frac{AB}{1-AB}$

(xx) Equation, containing at least on trigonometric function is called:

(a) Exponential equation (b) Partial equation
(c) Trigonometric equation (d) General equation

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Lahore Board - Annual 2007 Group II
Mathematics Paper-I(Sub), Time Allowed: 2:30 Hours
Max. Marks: 80 , Available online @ http://www.mathcity.org/fsc

Section – I

Note: *Write any Twenty-Five (25) short answers. While writing answer write its part number carefully. Each part carries two marks.* *50*

Q # 1:

(i) Find the multiplicative inverse of $(-4,-7)$

(ii) Find modulus and conjugate of $z = 1 - i\sqrt{3}$

(iii) Explain set of natural number is neither monoid nor a group w.r.t **"t"**

(iv) Define conjunction and disjunction of two statements *p* and *q*

(v) If $A = \{1,2,3,4,5,\}$ and $B = \{4,5,6,7,8,9,\}$ then find A-B and B-A

(vi) If $\begin{bmatrix} i & 0 \\ 1 & -i \end{bmatrix}$ =A show that $A^{-1} = I_2$

(vii) Define symmetric and hermitian matrix.

(viii) If $\begin{bmatrix} 2 & 5 & -1 \\ 3 & 4 & 2 \\ 1 & 2 & -2 \end{bmatrix}$ find $|A|$

(ix) Solve $x^2 + 7x + 12 = 0$

(x) Evaluate $w^{28} + w^{29} + 1$

(xi) Discuss the nature of roots of $25x^2 - 30x + 9 = 0$

(xii) α, β are roots of $5x^2 - x - 2 = 0$ form the equation whose roots are $\frac{3}{\alpha}$ *and* $\frac{3}{\beta}$

(xiii) Find partial fraction of $\frac{3x}{(x-1)(x+2)}$

(xiv) Define conditional equation and improper rational fraction.

(xv) If the nth term of the A.P is $(3n-1)$ find the A.P.?

(xvi) Sum the series $-3+(-1)+1....upto 16$ terms.

(xvii) Find value of r if $a_4 = \frac{8}{27}$ and $a_7 = \frac{-64}{729}$ of a G.P.

(xviii) Sum the series $1 + 2x + 4x^2 + ...\infty$

(xix) Find two G.M's between 1 and 8

(xx) Find 8^{th} term of H.P. $\frac{1}{2}, \frac{1}{5}, \frac{1}{8}...$

(xxi) How many different 4 digit number can be formed out of the digit $1,2,3,4,5,6$ when no digit is repeated?

(xxii) ${}^nC_{10} = \frac{12 \times 11}{2}$ find n

(xxiii) There are 5 green and 3 red balls in a box, one ball is taken out. What is probability that the ball is green?

(xxiv) Find first three terms in the expansion of $(\frac{a}{2} - \frac{2}{a})^6$ by using binomial theorem.

(xxv) Neglecting square and higher powers of ***"x"*** show that $\frac{\sqrt{1+2x}}{\sqrt{1-x}} = 1 + \frac{3x}{2}$

(xxvi) Show that the inequality $4^n > 3^n + 4$ is true for $n = 3,4$

(xxvii) Find r when $l = 56cm. \theta = 45^0$

(xxviii) $\sin\theta = -\frac{1}{\sqrt{2}}$ and terminal arm of the angle is not in Quadrant III,find values of $\tan\theta$ and $\cos\theta$

(xxix) Prove that $\sin(\theta+\frac{\pi}{6})+\cos(\theta+\frac{\pi}{3})=\cos\theta$

(xxx) Prove that $\sin 2\alpha = 2\sin\alpha\cos\alpha$

(xxxi) What is the range and domain of the cotangent function?

(xxxii) At the top of a cliff 80m high, the angle of depression of a boat is 12^0 .How far is the boat from the cliff?

(xxxiii) If in a triangle ABC $\beta = 60^0, \gamma = 15^0, b = \sqrt{6}$ find a.

(xxxiv) Show that $r_2 = s\ \tan(\frac{\beta}{2})$

(xxxv) If sides of triangle ABC a = 34 , b = 20 , c = 42 find area of the triangle.

(xxxvi) Find the value of $\tan\left(\sin^{-1}(\frac{-1}{2})\right)$

(xxxvii) Solve the equation $\cot^2\theta = \frac{1}{3}$

Section – II

Note: *Attempt any THREE questions.*

Q # 3 (a) Show that the set consisting of elements of the form $(a+\sqrt{3}b)$ (a, b are rationals) is an abelian group w.r.t addition. 5

(b) Solve the equation $\sqrt{x+8}+\sqrt{x+3}=\sqrt{12x+13}$ 5

Q # 4 (a) Solve the system of liner equations $2x-y+z=8,\ x+2y+2z=6, x-2y-z=1$ by Cramer's rule. 5

(b) Find the values of n and r when ${}^{n-1}C_{r-1} : {}^{n}C_{r} : {}^{n+1}C_{r+1} = 3:6:11$ 5

Q # 5 (a) Sum the series $3+5-7+9+11-13+15+17-19+----to\ 3n$ terms. 5

(b) If x is so small that its square and higher power by neglected ,then show that

$$\frac{(9+7x)^{\frac{1}{2}}-(16+3x)^{\frac{1}{4}}}{4+5x}=\frac{1}{4}-\frac{17}{384}x$$ 5

Q # 6 (a) Draw the graph of $y=\sin(\frac{x}{2})$ for $x\in[0,2\pi]$ 5

(b) Express $CosA+Cos3A+Cos5A+Cos7A$ as a product. 5

Q # 7 (a) Solve the triangle ABC in which $a=53, \beta = 88^0 36', \gamma = 31^0 54'$ 5

(b) Prove that $r=\frac{\Delta}{s}$ with usual notations. 5

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