

i) The number 1 is b) Irrational a) Prime number c) Even Number d) Odd Number ii) Every set is a _____ subset of it self. b) Improper a) Proper c) Finite d) Infinite iii) If $A = \begin{bmatrix} 2 & 1 \\ 6 & 3 \end{bmatrix}$ then cofactor of 6 is c) -6 d) 3 b) -1 a) 1 iv) If |A| is the determinant of a square matrix A then |A| is b) Modulus of A a) Always positive c) Always Negative d) May be +ve or -ve v) If $4^x = \frac{1}{2}$ then x equals a) $\frac{1}{2}$ b) $-\frac{1}{2}$ c) 2 d) -2 vi) if polynomial $x^2 + 3x + 7$ is divided by x + 1 then remainder is a) -5 b) 11 c) 5 d) -11 vii) $\frac{1}{(x^2+1)(x+1)}$ equals a) $\frac{A}{x^{2}+1} + \frac{Bx+C}{x+1}$ b) $\frac{A}{x^{2}+1} + \frac{B}{x+1}$ c) $\frac{Ax+B}{x^{2}+1}$ d) $\frac{Ax+B}{x^{2}+1} + \frac{C}{x+1}$ viii) Common difference of the A.P. 17,13,9, ... equals a) 4 b) -4 c) 30 d) 15 ix) No term in G.P. is b) 2 c) 1 d) 0 a) 3 x) H.M between *a* and *b* is a) $\frac{a+b}{2ab}$ b) $\frac{2ab}{a+b}$ c) $\frac{2ab}{a-b}$ d) $\frac{a-b}{2ab}$ xi) With usual notation 6P_4 equals b) 260 a) 160 c) 360 d) 340

xii) A die is rolled then*n*(*S*) equals a) 36 b) 6 c) 1 d) 9 xiii) The second term in the expansion of $(1-2x)^{\frac{1}{2}}$ is b) 2*x* a) *x* c) 3*x* d) 4*x* xiv) $\sin^2 a + \cos^2 b$ equals b) 0 a) 1 c) -1 d) None of these xv) Co-ratio of cosine is a) sec b) sine d) cos c) cosec xvi) Domain of $y = \cos x$ is a) $-\infty < x < +\infty$ b) $-1 \le y \le 1$ c) $0 < x < \infty$ d) $-\infty < x < 0$ xvii) Number of elements of a triangle are a) 3 b) 4 c) 6 d) 8 xviii) Radius r of inscribed circle is given as a) $\frac{\Delta}{s}$ b) $\frac{s}{\Lambda}$ d) $\frac{4\Delta}{abc}$ c) $\frac{\Delta}{s-c}$ xix) $2\tan^{-1}A$ equals a) $\tan^{-1}\frac{A}{1-A^2}$ b) $\tan^{-1} \frac{2A}{1+A^2}$ d) $\frac{2A}{1 A^2}$ c) $\tan^{-1} \frac{2A}{1-A^2}$ xx) If $\cos x = \frac{-\sqrt{3}}{2}$, then reference angle of $\cos x$ is a) $\frac{p}{3}$ b) $\frac{p}{4}$ c) $\frac{p}{6}$ d) $-\frac{p}{6}$

> Available online at http://www.MathCity.org If you have a question or query you can ask at http://forum.mathcity.org

If you found any error submit at http://www.mathcity.org/error

Composed by: Asif Ali (asif.mathematics@gmail.com)



Lakore Board - Arraal 2008 Group I

Mathematics Paper-I , Time Allowed: 2.30 Hours Max. Marks: 80 , Available online @ http://www.mathcity.org/fsc

50

Section – I

Note: All questions are to be attempted on answer book.

Q #2: Write any TWENTY-FIVE short answers of the following questions:

- (i) Prove that $\overline{z_1 + z_2} = \overline{z_1} + \overline{z_2}$, $\forall \ \overline{z_1}, \overline{z_2} \in \mathbb{C}$
- (ii) State the closure property of multiplication of the set of real number \mathbb{R} .
- (iii) Define a graph (G, *).
- (iv) What is deduction?
- (v) What is the associated binary operation?
- (vi) Define identity matrix.

(vii) If
$$A = \begin{bmatrix} 2 & 3 \\ 1 & 5 \end{bmatrix}$$
 find $|A|$.

(viii) Define raw echelon form of a matrix.

(ix) Solve the equation
$$\frac{a}{ax-1} + \frac{b}{bx-1} = a+b$$
.

- (x) Evaluate $(1 w w^2)^8$.
- (xi) If a, b are the roots of the equation $x^2 px p c = 0$ prove that (1+a)(1+b) = 1-c.

(xii) Prove that
$$\frac{x^2}{a^2} + \frac{(mx+c)^2}{b^2} = 1$$
 will have equal roots if $c^2 = a^2 m^2 b^2$.

(xiii) Resolve $\frac{x^2+1}{(x+1)(x-1)}$ into partial fractions.

(xiv) Find the nth term of the sequence $\left(\frac{4}{3}\right)^2, \left(\frac{7}{3}\right)^2, \left(\frac{10}{3}\right)^2, \dots$

(xv) Find the sum of the infinite geometric series $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$

(xvi) Find the 12th term of H.P.
$$\frac{1}{2}, \frac{1}{5}, \frac{1}{8}, \dots$$

(xvii) Find G.M between -2i and 8i.

(xviii) Verify that
$$A > G > H$$
, $(G > 0)$ if $a = 2$, $b = 8$.

- (xix) Find the value of *n* when ${}^{11}P_n = 11.10.9$.
- (xx) How many diagonals can be formed by joining the vertices of the polygon having 5 sides?

(xxi) From a box containing slips numbered 1, 2, 3, ..., 5 one slip is picked up; find the probability that the number on the slip is a prime number.

- (xxii) Evaluate ${}^{12}C_3$.
- (xxiii) Prove that $1+3+5+...+(2n-1) = n^2$ for n = 1,2
- (xxiv) Find the term involving x^4 in the expansion of $(3-2x)^7$.
- (xxv) Expand $(8-2x)^{-1}$ up to four terms.
- (xxvi) Prove that $1 + \cot^2 q = \cos ec^2 q$.
- (xxvii) Find the values of all trigonometric function at $q = 390^{\circ}$.
- (xxviii) Prove that $\sin(360^\circ q) = -\sin q$.
- (xxix) Prove that $\sin 2a = 2\sin a \cos a$.
- (xxx) Prove that $\cos 20^{\circ} + \cos 100^{\circ} + \cos 140^{\circ} = 0$.

(xxxi) Find the period of $3\cos\frac{x}{5}$. (xxxii) When the angle between the ground and the sun is 30°, flag pole casts a shadow of 40m long? Find the height of the top of the flag. (xxxii) Solve the triangle ABC if a = 32, b = 40, c = 66(xxxiv) Find the area of the triangle ABC where b = 37, c = 45, a = 30°50(xxxv) Show that $r_1 = s \tan \frac{a}{2}$. (xxxvi) Show that $\tan[\sin^{-1}x] = \frac{x}{\sqrt{1-x^2}}$. (xxxvii) Solve the equation $\sin 2x = \cos x$.

Section - II

Note: Attempt any THREE questions.

Q # 3 (a) Prove that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$				5
(b) Prove that the determinant	b+c	a	a^2	
	c+a	b	$b^{2} = (a+b+c)(a-b)(b-c)(c-a)$	5
	a+b	С	c^2	

Q # 4 (a) Show that the roots of the equation $(p+q)x^2 - px + q = 0$ will be rational. 5 **(b)** Sum to n terms the series $1+(a+b)+(a^2+ab+b^2)+(a^3+a^2b+ab^2+b^3)+...$ 5

Q # **5** (**a**) There is 8 men and 10 women of a club. How many committees of seven can be formed having at least 4 girls? 5

5

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

Q # 6 (a) Prove that $\frac{\tan q + \sec q - 1}{\tan q - \sec q + 1} = \tan q + \sec q$. 5 **(b)** Prove that $\cos 20^{\circ} \cos 40^{\circ} \cos 60^{\circ} \cos 80^{\circ} = \frac{1}{16}$. 5

Q #7 (a) Prove that $R = \frac{a}{2\sin a} = \frac{b}{2\sin b} = \frac{c}{2\sin g}$ with usual notations. 5 (b) Prove that $2\tan^{-1}\frac{1}{3} + \tan^{-1}\frac{1}{7} = \frac{p}{4}$. 5

> Available online at http://www.MathCity.org If you have a question or query you can ask at http://forum.mathcity.org

If you found any error submit at http://www.mathcity.org/error

Composed by: Asif Ali (asif.mathematics@gmail.com)