BALOCHISTAN BOARD OF INTERMEDIATE & SECONDARY EDUCATION, QUETTA

INTERMEDIATE (ANNUAL) EXAMINATION, 2018 MATH.

TIME: 3 HOURS * **SUBJECT:- MATHEMATICS - A** MARKS:- 100

Group – I PASS MARKS:- 33

NOTE: Scientific calculator is allowed. Write question no and its part no same as in question paper.

SECTION – A

Q.1(a). Choose the correct answer. $20 \times 1 = 20$

(i). $(-1)^{5/2}$ = --------- $(i, -i, 1, -1)$

(ii). Multiplication identity of complex numbers is ((1,0), (0,0), (0,1), none of these)

(iii). In a row matrix number of rows is $(1, 2, n, m)$

(iv). If A is a non-singular squre matrix then $(A^{-1})^{-1}$ = -------- $(A, A^{-1}$, I, none of these)

(v). In dot product of vectors which of the following law does not hold (associative, commutative law, distributive law, all of them)

(vi). Magnitude of $-\frac{1}{\sqrt{2}}\hat{\imath} + \frac{1}{\sqrt{2}}\hat{\jmath}$ is $(1, 2, \sqrt{2}, \frac{1}{2})$

(vii). 4_{P_5} = (24, -24, -1, not possible)

(viii). 0! = --------- (1, 0, -1, -2)

(ix). A sequence is called ---------- if the difference between two consecutive terms is same (arithmetic, harmonic, geometric, constant)

(x). Geometric mean between 9 and 16 is $(\pm 16, \frac{25}{2}, \pm 12$, none of these)

(xi). $\sum_{k=1}^{n} k$ = ----- $(n, \frac{(n+1)(2n+1)}{6}, \frac{n(n+1)}{2}$, none of these)

(xii). If $f(x) = 2$ then $f(15)$ = ---------- (2, 15, 30, 17)

(xiii). The graph of a square root function is (line, curve, square, rectangle)

(xiv). There are --------- terms in the expansion of $(x+1)^{\frac{1}{2}}$ where $|x| < 1$ (finite terms, infinite terms, expansion is not possible, all of them are incorrect)

(xv). $-2sin\alpha sin\beta$ = ----------
$(cos(\alpha+\beta) - cos(\alpha-\beta), sin(\alpha+\beta)\, sin(\alpha-)$, $-sin2\alpha$, none of these)

(xvi). $-3sin\alpha - 4\,sin^3\alpha$ = ----------
$(sin3\alpha, sin2\alpha, cos3\alpha, cos2\alpha)$

(xvii). $1 + tan^2\theta = (cosec^2\theta, -sec^2\theta, cos^2\theta, sec^2\theta)$

(xviii). A circle which touches one side of the triangle externally and the other two sides internally when produced is called (circumcircle, unit circle, incircle, escribed circle)

(xix). Period of $sinx$ is $(\pi, 2\pi, 3\pi, 5\pi)$

(xx). $X-$ intercept of the line $x + 2y = 4$ is (0, 2,4, none of these)

SECTION – B

Q.2. Attempt any ten (10) parts. $10 \times 4 = 40$

(i). Find multiplicative inverse of $a + bi$

(ii). If $A = \begin{bmatrix} 2 & 5 \\ 5 & 8x \end{bmatrix}$ is singular, find value of x.

(iii). Find direction cosines of the vector $\hat{\imath} + \hat{\jmath} - \hat{k}$

(iv). Find the moment about A (1, 3, 4) of the force $\vec{F} = \hat{\imath} + 2\hat{\jmath} - \hat{k}$ applied at B (2, 1, 3)

(v). if x, x^2, x^3, -----, are in G.P. Find a_{17}.

(vi). How many diagonals can be drawn in a plane figure of 10 sides?

(vii). Write in factorial form $\frac{n-4}{(n+1)n}$

(viii). Expand by using binomial theorem $(1 + 2q)^4$

(ix). If $f(x) = x^2 + 1, g(x) = 3x - 1$, show that $f(2) = g(2)$

(x). Sketch the graph of $f(x) = 5x + 1$

(xi). Solve the inequality and draw the number line $x + 1 \geq -3x + 1$

(xii). Find area of the triangle ABC if $a = 122,\ b = 198,\ c = 100$

(xiii). Find the period of $cos5x$

(xiv). Express the difference $sin3y - sin3z$ as a product

(xv). Without using calculator, find value of $tan^{-1}(\sqrt{3})$

SECTION – C

Attempt any five (5) questions. $5 \times 8 = 40$

Q.3. Factorize the polynomial $Z^3 + 3Z^2 + 19Z + 17$

Q.4. Reduce the matrix into echelon form $\begin{bmatrix} 1 & -1 & 3 \\ 0 & 3 & 2 \\ 2 & -4 & 1 \end{bmatrix}$

Q.5. If $a_n = \left(\frac{1}{4}\right)^n$ then find its sum upto n terms

Q.6. Sum the series upt n terms $2 + (2 + 5) + (2 + 5 + 8)$ ---

Q.7. Using mathematical induction method, show that $7 + 14 + 21 + \cdots + 7n = \frac{7n(n+1)}{2}$

Q.8. Show that $\frac{sinA - sinB}{sinA + sinB} = cot\left(\frac{A+B}{2}\right) tan\left(\frac{A-B}{2}\right)$

Q.9. Find r_1, r_2 and r_3 if $a = 24,\ b = 34,\ c = 42$