GROUP : SECOND	11th CLASS – 1st Annual 2024	MARKS : 20
	OBJECTIVE	

NOTE: You have four choices for each objective type question as A , B , C and D . The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question.

DGK-2-24

QUESTION NO. 1

1 Number of necklaces can be made from 6 beads
(A) 720 (B) 120 (C) 90 (D) 60

2 Middle term in expansion of $(3 + x)^4$ is
(A) $81x^2$ (B) $54x^2$ (C) $26x^2$ (D) $108x^2$

3 One degree is equal to ..... radian
(A) $\frac{180}{\pi}$ (B) $\frac{\pi}{180}$ (C) $\frac{\pi}{90}$ (D) π

4 $\cot(90 - \alpha)$ = ...
(A) $\tan\alpha$ (B) $-\tan\alpha$ (C) $\cot\alpha$ (D) $-\cot\alpha$

5 Period of sin x/3 is
(A) 2π (B) $2\pi/3$ (C) 6π (D) 3π

6 $\cos\alpha/2$ = ...
(A) $\frac{s(s-a)}{bc}$ (B) $\frac{s(s-b)}{ac}$ (C) $\sqrt{\frac{s(s-a)}{bc}}$ (D) $\sqrt{\frac{s(s-b)}{ac}}$

7 $\sec(\cos^{-1}\frac{1}{2})$ = ----------
(A) 1/2 (B) 2 (C) $\pi/3$ (D) $\pi/6$

8 If $\cos x = -\sqrt{3}/2$, then value of x is
(A) $\frac{5\pi}{6}$ (B) $\frac{\pi}{6}$ (C) $\frac{\pi}{3}$ (D) $-\pi/3$

9 $a < b \Rightarrow -a > -b$, $a, b \in R$ property used is
(A) Transitive (B) Additive (C) Multiplicative (D) Trichotomy

10 If $Z = 1 - i$, then $|Z|$ = ...
(A) 2 (B) -2 (C) $\sqrt{-2}$ (D) $\sqrt{2}$

11 A and B are disjoint sets then
(A) $A \cap B = \emptyset$ (B) $A \cup B = \emptyset$ (C) $A - B = \emptyset$ (D) $B - A = \emptyset$

12 Tabular form of $\{x \mid x \in E \wedge 2 < x \leq 4\}$
(A) {2 , 3 , 4} (B) {2 , 4} (C) {4} (D) { ∅ }

13 The set A has m elements , Number of elements in power set of A
(A) 2^{m-1} (B) 2^m (C) 2^{m+1} (D) $2^{m/2}$

14 Rank of $\begin{bmatrix}1 & 1\\1 & 1\end{bmatrix}$ is
(A) Zero (B) 1 (C) - 1 (D) 2

15 Determinant of [-5] is
(A) Zero (B) Not possible (C) - 5 (D) 5

16 α, β are roots of $ax^2 - bx + c = 0$, then $\alpha + \beta$ = ----------
(A) $\frac{b}{a}$ (B) $-\frac{b}{a}$ (C) $\frac{c}{a}$ (D) $-\frac{c}{a}$

17 If polynomial $x^2 - 2x + 2$ is divided by $x - 1$, then remainder is
(A) -1 (B) 1 (C) 0 (D) 2

18 Partial fraction of $\frac{x}{(x-1)(x+2)} = \frac{1}{3(x-1)} + \frac{B}{x+2}$, then value of B is
(A) -3/2 (B) 3/2 (C) 2/3 (D) -2/3

19 Sum of n-arithmatic means between a and b is
(A) $\frac{a+b}{2}$ (B) n(a+b) (C) (a+b) (D) $n\left(\frac{a+b}{2}\right)$

20 Next term of sequence 7 , 9 , 12 , ... Is
(A) 14 (B) 15 (C) 16 (D) 18

D

11th CLASS – 1st Annual 2024

MATHEMATICS	SUBJECTIVE PART	TIME: 2 HRS 30 MINUTES
GROUP : SECOND		MARKS: 80

SECTION–I

DAK-2-24

QUESTION NO. 2 Write short answers any Eight (8) of the following 16

i	Simplify $(5, -4)(-3, -2)$
ii	Separate into real and imaginary parts $\frac{2-7i}{4+5i}$
iii	Prove that $\bar{Z} = Z$ if Z is real
iv	Simplify $(a + b\,i)^2$
v	Write two proper subsets of $\{a, b, c\}$
vi	Show that $(p \wedge q) \rightarrow p$ is a tautology
vii	Find x and y if $\begin{bmatrix} 2 & 0 & x \\ 1 & y & 3 \end{bmatrix} + 2\begin{bmatrix} 1 & x & y \\ 0 & 2 & -1 \end{bmatrix} = \begin{bmatrix} 4 & -2 & 3 \\ 1 & 6 & 1 \end{bmatrix}$
viii	Find the matrix X if $\begin{bmatrix} 5 & 2 \\ -2 & 1 \end{bmatrix} X = \begin{bmatrix} 2 & 1 \\ 5 & 10 \end{bmatrix}$
ix	If $A = \begin{bmatrix} 1 & 2 & -3 \\ 0 & -2 & 0 \\ -2 & -2 & 1 \end{bmatrix}$, then find A_{12} and A_{32}
x	Evaluate $\omega^{28} + \omega^{29} + 1$
xi	Use remainder theorem to find the remainder when $x^2 + 3x + 7$ is divided by $x + 1$
xii	Discuss the nature of the roots of equation $2x^2 - 5x + 1 = 0$

QUESTION NO. 3 Write short answers any Eight (8) of the following 16

i	Define partial fraction resolution
ii	Suppose $\frac{7x+25}{(x+3)(x+4)} = \frac{A}{x+3} + \frac{B}{x+4}$ Find the values of A and B
iii	Write the first four terms of the following sequence, if $a_n = (-1)^n n^2$
iv	Which term of the A.P $5, 2, -1, \ldots\ldots$ is -85 ?
v	If $\frac{1}{a}, \frac{1}{b}$ and $\frac{1}{c}$ are in G.P. Show that the common ratio is $\pm\sqrt{\frac{a}{c}}$
vi	Show that $G^2 = AH$ if $a = 2i$, $b = 4i$
vii	Find the value of n if ${}^nP_2 = 30$
viii	Find the number of the diagonals of a 6-sided figure
ix	A die is rolled. What is the probability that the dots on the top are greater than 4 ?
x	Prove that $4^k > 3^k + 4$ is true for $k = 2, 3$
xi	Calculate $(0.97)^3$ by means of binomial theorem
xii	Expand up to 4 terms $(1 - x)^{1/2}$, taking the values of x such that the expansion is valid

(P.T.O)

1)

DGK-2-24

QUESTION NO. 4 Write short answers any Nine (9) of the following **18**

i	Find ℓ , when $\theta = 65^\circ 20'$, r = 18 mm
ii	Verify that $2 \sin 45^\circ + \frac{1}{2} \operatorname{cosec} 45^\circ = \frac{3}{\sqrt{2}}$
iii	Without using the tables , find the value of sec (- 300)
iv	Prove that $\frac{\cos 8^\circ - \sin 8^\circ}{\cos 8^\circ + \sin 8^\circ} = \tan 37^\circ$
v	Prove that $1 + \tan \alpha \tan 2\alpha = \sec 2\alpha$
vi	Write down the domain and range of $\sin x$
vii	Find the period of $\cot \frac{x}{2}$
viii	Draw the graph of $y = \cos x$ for $0 \leq x \leq 360^\circ$
ix	What is difference between right angle triangle and oblique triangle
x	Find the area of the triangle ABC , if $a = 200$, $b = 120$, $\gamma = 150^\circ$
xi	Find the radius of in-circle if $a = 13$, $b = 14$, $c = 15$
xii	Without using calculator , show that $\tan^{-1} \frac{5}{12} = \sin^{-1} \frac{5}{13}$
xiii	Solve the equation $\sin x + \cos x = 0$

SECTION-II

Note: Attempt any Three questions from this section **10 x 3 = 30**

Q.5- (A)	Solve the equation $\sqrt{5x^2 + 7x + 2} - \sqrt{4x^2 + 7x + 18} = x - 4$
(B)	Use matrices to solve the following system of equation $2x_1 + x_2 + 3x_3 = 3$ $x_1 + x_2 - 2x_3 = 0$ $-3x_1 - x_2 + x_3 = -4$
Q.6- (A)	Resolve the following into partial fractions $\frac{x^2}{(x-2)(x-1)^2}$
(B)	Find n so that $\frac{a^n + b^n}{a^{n-1} + b^{n-1}}$ may be the A.M. between a and b
Q.7-(A)	A natural number is chosen out of the first fifty natural numbers. What is the probability that the chosen number is multiple of 3 or 5 ?
(B)	Expand $\left(\frac{x}{2} - \frac{2}{x^2}\right)^6$ by using binomial theorem
Q.8-(A)	Show that $\cos 20^\circ \cos 40^\circ \cos 80^\circ = \frac{1}{8}$
(B)	The sides of triangle are $x^2 + x + 1$, $2x + 1$ and $x^2 - 1$ Prove that the greatest angle of the triangle is 120°
Q.9-(A)	Prove that : $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = \sec\theta - \tan\theta$ Where θ is not an odd multiple of $\frac{\pi}{2}$
(B)	Prove that : $\cos^{-1} A + \cos^{-1} B = \cos^{-1} [AB - \sqrt{1 - A^2}\sqrt{1 - B^2}]$