DGK-G2 11-19

PAPER CODE - 6192

(11th CLASS - 12019)

ATHEMATICS , GROUP SECOND TIME: 30 MINUTES , MARKS: 20

OBJECTIVE

)TE: 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 mark in that question.

ESTION NO. 1

(1) If $Z = -3 - 4i$ Then $|Z|$ is
(A) 4 (B) 7 (C) 1 (D) 5

(2) If a , b are the elements of a group G , then $(ab)^{-1} =$
(A) $a^{-1}b^{-1}$ (B) $b^{-1}a^{-1}$ (C) $\frac{-1}{ab}$ (D) $\frac{1}{(ab)^{-1}}$

(3) If A is a matrix of order 2x2 then $|KA| =$
(A) $K|A|$ (B) $K^2|A|$ (C) $K|A|^2$ (D) KA

(4) If $\begin{bmatrix} \lambda & 1 \\ -2 & -1 \end{bmatrix}$ is singular matrix then $\lambda =$
(A) 2 (B) i (C) -1 (D) - 2

(5) Product of four 4^{th} roots of unity is
(A) i (B) - i (C) - 1 (D) 1

(6) If $\propto$, β are the roots of $3x^2 - 2x + 4 = 0$ the $\propto + \beta =$
(A) $\frac{1}{2}$ (B) $\frac{2}{5}$ (C) $\frac{2}{3}$ (D) $\frac{-2}{5}$

(7) Partial fraction of $\frac{4x^3}{(x^2-1)(x+1)^2}$ is of the form
(A) $\frac{A}{x-1} + \frac{B}{x+1}$ (B) $\frac{A}{x^2-1} + \frac{B}{(x+1)^2}$ (C) $\frac{A}{x-1} + \frac{B}{x+1} + \frac{C}{(x+1)^2} + \frac{D}{(x+1)^3}$ (D) $\frac{Ax+B}{x^2-1} + \frac{C}{x+1} + \frac{D}{(x+1)^2}$

(8) If $a_{n-3} = 2n - 5$ then 7^{th} term is
(A) 9 (B) 15 (C) 11 (D) 13

(9) Arithmetic mean between $\sqrt{2}$ and $3\sqrt{2}$ is
(A) $3\sqrt{2}$ (B) $\sqrt{2}$ (C) 2 (D) $2\sqrt{2}$

(10) A fair coin is tossed twice then probability of getting tail both times is
(A) 1 (B) ½ (C) ¾ (D) ¼

(11) If ${}^nC_6 = {}^nC_8$ then n will be
(A) 2 (B) 6 (C) 8 (D) 14

(12) The expansion of $(3 - 5x)^{1/2}$ is valid only if
(A) $|x| < 3$ (B) $|x| < 5$ (C) $|x| < 5/3$ (D) $|x| < 3/5$

(13) Sum of exponents of a and b in every term of $(a+b)^6$ is
(A) 6 (B) 7 (C) 3 (D) 12

(14) In anti clock wise direction $\frac{1}{4}$ rotation is equal to
(A) 90° (B) 180° (C) 270° (D) 45°

(15) $\sin 8\theta - \sin 4\theta =$
(A) $2 \sin 6\theta \sin 4\theta$ (B) $2 \cos 2\theta \sin 6\theta$ (C) $2 \cos 6\theta \sin 2\theta$ (D) $-2 \sin 6\theta \cos 2\theta$

(16) The period of sin 3x is
(A) π (B) 2π (C) $\frac{\pi}{3}$ (D) $\frac{2\pi}{3}$

(17) If an angle is in standard form then its vertex is at
(A) (1,0) (B) (0,0) (C) (0,1) (D) (1,1)

(18) For a triangle ABC with usual notations $\gamma =$
(A) $\frac{\Delta}{s}$ (B) $\frac{\Delta}{s-a}$ (C) $\frac{\Delta}{s-b}$ (D) $\frac{\Delta}{s-c}$

(19) The value of $\sin^{-1}(\cos \pi/6)$ is
(A) $\pi/6$ (B) $\pi/2$ (C) $\frac{3\pi}{2}$ (D) $\pi/3$

(20) The solution of $\tan x = \frac{1}{\sqrt{3}}$ for $x \in [0 , \pi]$ is
(A) $\{\pi/2\}$ (B) $\{\pi/6\}$ (C) $\{\pi/3\}$ (D) $\{\pi/4\}$

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COND

11th CLASS – 12019
SUBJECTIVE
SECTION-I

TIME : 2.30 HOURS
MARKS : 80

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

1	Prove the following rule $\frac{a}{b}+\frac{c}{d}=\frac{ad+bc}{bd}$
2	Simplify $(5,-4)\times(-3,-2)$
3	Express the complex number $1+i\sqrt{3}$ in polar form
4	Show that the statement $p \rightarrow (p \vee q)$ is a tautology
5	Write inverse of the relation and also tell whether relation and its inverse is a function or not $\{(x,y)/\ x^2+y^2=9,\ \|x\|\leq 3,\ \|y\|\leq 3\}$
6	If a , b are elements of a group G , then show that $(ab)^{-1}=b^{-1}a^{-1}$
7	Find the inverse of the matrix : $\begin{bmatrix} 2i & i \\ i & -i \end{bmatrix}$
8	Without expansion verify that $\begin{vmatrix} bc & ca & ab \\ \frac{1}{a} & \frac{1}{b} & \frac{1}{c} \\ a & b & c \end{vmatrix}=0$
9	If the matrices A and B are symmetric and AB = BA , show that AB is symmetric
10	Evaluate $(1+w-w^2)(1-w+w^2)$, where w is complex cube root of unity
11	Show that the roots of the equation will be rational : $px^2-(p-q)x-q=0$
12	Solve the equation by factorization $x^2-x=2$

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

1	Define a partial fraction
2	Resolve into partial fraction $\frac{x^2+1}{(x-1)(x+1)}$
3	Write in mixed form $\frac{3x^2+1}{x-1}$
4	Find the next two terms of $-1, 2, 12, 40, \ldots\ldots\ldots$
5	If $S_n=n(2n-1)$, Find the series
6	Find the 5th term of GoP , 3 , 6 , 12 , ...
7	Find the G.M between $-2i$ and $8i$
8	Sum the infinite geometric series $4+2\sqrt{2}+2+\sqrt{2}+1+\ldots\ldots$
9	Find n , if ${}^{11}P_n = 11.10.9$
10	Write the principles of Mathematical induction
11	Calculate by binomial theorem $(.97)^3$ up to three decimal places
12	If x is so small , that its square and higher powers be neglected , Prove $\frac{1-x}{\sqrt{1+x}}\approx 1-\frac{3x}{2}$

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

1	Prove that $\tan\theta+\cot\theta=\operatorname{cosec}\theta\sec\theta$
2	Find x if $\tan^2 45^\circ-\cos^2 60^\circ=x\sin 45^\circ\cos 45^\circ\tan 60^\circ$
3	Define radian
4	Prove that $\sin(45^\circ+\alpha)=\frac{1}{\sqrt{2}}(\sin\alpha+\cos\alpha)$
5	Prove that $\frac{\sin 2\alpha}{1+\cos 2\alpha}=\tan\alpha$
6	Express $\sin 12^\circ\sin 46^\circ$ as sum or difference
7	Find period of $\sin 3x$
8	The area of triangle is 2437 if a = 79 and c = 97 then find angle β
9	State law of tangents (any two)
10	If a = 7 , b = 3 , c = 5 Find α
11	Show that $\cos(\sin^{-1}x)=\sqrt{1-x^2}$
12	Solve the equation $\sin x=\frac{1}{2}$
13	Solve the trigonometric equation $\tan\theta=\frac{1}{\sqrt{3}}$

(P.T.O)

SECTION-II

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

Q. 5-(A)	Prove that the set $S = \{1, -1, i, -i\}$ is an abelian group under multiplication
(B)	A person invests Rs 2000 at 4 % interest compounded annually. What total amount will he get after 5 year
Q. 6-(A)	Show that $\begin{vmatrix} x & 1 & 1 & 1 \\ 1 & x & 1 & 1 \\ 1 & 1 & x & 1 \\ 1 & 1 & 1 & x \end{vmatrix} = (x+3)(x-1)^3$
(B)	How many signals can be given by 6 – flags of different colours when any number of flags can be used at a time
Q.7-(A)	Find the three cube roots of unity
(B)	If x is so small that its cube and higher power can be neglected , then show that $\sqrt{\frac{1-x}{1+x}} = 1 - x + \frac{1}{2}x^2$
Q.8-(A)	Without calculator find the values of the trigonometric functions of the angle $\frac{-71\pi}{6}$
(B)	Without using calculator , Prove that : $\sin 19^\circ . \cos 11^\circ + \sin 71^\circ . \sin 11^\circ = \frac{1}{2}$
Q.9-(A)	If the measures of the sides of a triangle ABC are 17 , 10 , 21 . Find R , r , r_1 , r_2 and r_3
(B)	Prove that $\tan^{-1}\frac{3}{4} + \tan^{-1}\frac{3}{5} - \tan^{-1}\frac{8}{19} = \frac{\pi}{4}$