B

BWP-21

Note : Four possible choices A , B , C ,D to each question are given. Which choice is correct fill that circle in front of that Question No. Use Marker or Pen to fill the circles. Cutting or filling two or more circles will result in Zero Mark in that Question.

Q.No.1

(1) If $\cos x = \dfrac{-\sqrt{3}}{2}$, then its Reference Angle is : (A) $\dfrac{\pi}{3}$ (B) $\dfrac{\pi}{4}$ (C) $\dfrac{\pi}{6}$ (D) $\dfrac{-\pi}{6}$

(2) $\cos(\sec^{-1}(1)) = $: (A) 1 (B) 0 (C) 30° (D) 2

(3) $\sqrt{\dfrac{s(s-a)}{bc}} = $: (A) $\sin\dfrac{\alpha}{2}$ (B) $\sin\dfrac{\beta}{2}$ (C) $\cos\dfrac{\beta}{2}$ (D) $\cos\dfrac{\alpha}{2}$

(4) If ABC be any Triangle and $\gamma = 90^{o}$, then : (A) $a^2 + b^2 = c^2$ (B) $a^2 + c^2 = b^2$ (C) $b^2 + c^2 = a^2$ (D) $a^2 + b^2 + c^2 = 0$

(5) Period of $\sin\dfrac{x}{5}$ is : (A) 2π (B) $\dfrac{\pi}{5}$ (C) 10π (D) 5π

(6) $2\sin 12°\sin 46° = $: (A) $\cos 34^{o}\cos 58^{o}$ (B) $\sin 34^{o} + \sin 58^{o}$ (C) $\sin 34^{o} - \sin 58^{o}$ (D) $\cos 34^{o} - \cos 58^{o}$

(7) $\dfrac{3\pi}{2}$ Radians equals to : (A) 120° (B) 150° (C) 270° (D) 190°

(8) The Vertex of an angle in standard form is at : (A) $(0,0)$ (B) $(1,0)$ (C) $(0,1)$ (D) $(1,1)$

(9) In the Expansion of $(a+b)^7$, the 2nd term is : (A) a^7 (B) $7a^6 b$ (C) $7ab^6$ (D) $7b^6$

(10) $^nP_n = $ ----- : (A) $n!$ (B) $(n+1)!$ (C) 1 (D) $(n-1)!$

(11) Harmonic Mean between x and y is : (A) $\dfrac{2(x+y)}{xy}$ (B) $\dfrac{2xy}{x+y}$ (C) $\dfrac{x+y}{2xy}$ (D) $\dfrac{x+y}{2}$

(12) The nth term of the sequence $\dfrac{1}{3}$, $\dfrac{2}{5}$, $\dfrac{3}{7}$, $\dfrac{4}{9}$ ------- is : (A) $\dfrac{n}{2n-1}$ (B) $\dfrac{n}{2n+1}$ (C) $\dfrac{n}{3n-1}$ (D) $\dfrac{n}{3n+1}$

(13) The next two terms of the sequence 1 , 3 , 7 , 15 , 31 ------- are : (A) 112 , 288 (B) 122 , 144 (C) 102 , 188 (D) 63 , 127

(14) Partial Fractions of $\dfrac{1}{x(x+1)}$ are = --------- : (A) $\dfrac{1}{x-1} + \dfrac{1}{x+1}$ (B) $\dfrac{1}{x-1} - \dfrac{1}{x+1}$ (C) $\dfrac{1}{x} + \dfrac{1}{x+1}$ (D) $\dfrac{1}{x} - \dfrac{1}{x+1}$

(15) If α, β are the roots of the equation $x^2 - 4x + 5 = 0$, then $\alpha\beta$ is equal to : (A) 2 (B) 4 (C) 5 (D) -4

(16) $(a+b)x = ax + bx$ is called : (A) Identity (B) Equation (C) Conditional (D) Fraction

(17) If $A = \begin{vmatrix} 1 & -2 & 3 \\ -2 & 3 & 1 \\ 4 & -3 & 2 \end{vmatrix}$, then A_{33} equals : (A) -1 (B) 1 (C) 7 (D) -7

(18) $\begin{bmatrix} K & 0 \\ 0 & K \end{bmatrix}$ is : (A) Zero Matrix (B) Non – Diagonal Matrix (C) Identity Matrix (D) Scalar Matrix

(19) If $A \subseteq B$ and $B \subseteq A$, then : (A) $A = \emptyset$ (B) $A = B$ (C) $B = \emptyset$ (D) $A \cap B = \emptyset$

(20) The Multiplicative Inverse of Complex Number $(0,1)$ is : (A) $(0,-1)$ (B) $(0,1)$ (C) $(-1,0)$ (D) $(0,0)$

Roll No.	1112 - 2000	Session (2017 – 19) to (2020 – 22)	Inter (Part – I)
Mathematics (Subjective)	Inter – A – 2021	Time 2 : 30 Hours Marks : 80	

Note: It is compulsory to attempt any (8 – 8) Parts each from Q.No. 2 and Q.No.3 while attempt any (9) Parts from Q.No.4. Attempt any (3) Questions from Part – II .Write same Question No. and its Part No. as given in the Question Paper.

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Part - I   BWP-21   25 x 2 = 50

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Q.No.2

(i) Find the Sum and Product of the Complex Numbers $(8, 9)$ and $(5, -6)$.

(ii) Separate into Real and Imaginary Parts $\dfrac{2 - 7i}{4 + 5i}$ and write as Simple Complex Number.

(iii) For all Complex Numbers Z, show that $Z^2 + \bar{Z}^2$ is a real number.

(iv) Convert the theorem $(A \cap B)' = A' \cup B'$ into logical form and prove by constructing the Truth Table.

(v) If G is a group under the operation $*$ and $a, b \in G$, then solve the equation $a * x = b$

(vi) Write the Descriptive Form and Tabular Form of the Set $\{ x \mid x \in 0 \wedge 3 < x < 12 \}$

(vii) If $A = \begin{bmatrix} 1 & 2 \\ a & b \end{bmatrix}$ and $A^2 = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$ find the values of a and b.

(viii) Find the Co–factors A_{12} and A_{22} if $A = \begin{bmatrix} 1 & -2 & 3 \\ -2 & 3 & 1 \\ 4 & -3 & 2 \end{bmatrix}$

(ix) Find the value of x if $\begin{vmatrix} 3 & 1 & x \\ -1 & 3 & 4 \\ x & 1 & 0 \end{vmatrix} = -30$

(x) If α, β are the roots of $5x^2 - x - 2 = 0$ then form an equation whose roots are $\dfrac{3}{\alpha}$ and $\dfrac{3}{\beta}$

(xi) Find Three Cube Roots of Unity.

(xii) Solve the Equation $2x^4 - 32 = 0$

Q.No.3

(i) Write $\dfrac{3x^2 - 4x - 5}{(x - 2)(x^2 + 7x + 10)}$ in form of Partial Fraction without finding the constants.

(ii) Write $\dfrac{x^2}{(x - 2)(x - 1)^2}$ in form of Partial Fractions without finding the constants.

(iii) Calculate $(2.02)^4$ by means of Binomial Theorem.

(iv) A die is rolled. What is the Probability that dots on the Top are greater than '4' ?

(v) Use Binomial Theorem to expand $\left(\dfrac{x}{2} - \dfrac{2}{x^3}\right)^6$

(vi) Expand $(4 - 3x)^{\frac{1}{2}}$ upto three terms taking the values of 'x' such that Expansion is valid.

(vii) Find a_8 of the sequence $1, -3, 5, -7, 9, -11, \text{------}$

(viii) Sum the Series $\dfrac{3}{\sqrt{2}} + 2\sqrt{2} + \dfrac{5}{\sqrt{2}} + \text{-----} + a_{13}$

(ix) Find two G.M.'s between 2 and 16 .

(x) Which term of the A.P. $5, 2, -1 \text{ ----}$ is -85 ?

(xi) Evaluate $20P_3$

(xii) If $^nC_8 = {}^nC_{12}$ find 'n'

Q.No.4

(i) What is the circular measure of the angle between the hands of a watch at 4 O' Clock ?

(ii) Verify $\cos 2\theta = 2\cos^2\theta - 1$, when $\theta = 30^\circ, 45^\circ$

(iii) Prove that $\cos^4\theta - \sin^4\theta = \cos^2\theta - \sin^2\theta$ for all $\theta \in R$

(iv) Find the value of $\cos 105^\circ$

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P.T.O.

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