BWP-11-19

	(B)	L.R.No. 1117	Paper Code No. 6193
Paper I	(Objective Type)	Inter -A- 2019	Session (2015 -17) to (2018 – 20)
Time :	30 Minutes	Inter (Part - I)	
Marks :	20		

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.

No.1) The reference angle for $\text{Tan}\theta = \sqrt{3}$ is : (A) $\frac{\pi}{6}$ (B) $\frac{-\pi}{6}$ (C) $\frac{\pi}{3}$ (D) $\frac{-\pi}{3}$

2) $\text{Sin}(\text{Tan}^{-1}0^\circ) =$: (A) -1 (B) 1 (C) 0 (D) ∞

3) Radius of e – circle opposite to vertex " A " of ΔABC is :
(A) $\frac{\Delta}{s}$ (B) $\frac{\Delta}{s-a}$ (C) $\frac{\Delta}{s-b}$ (D) $\frac{\Delta}{s-c}$

4) The angle above the Horizontal Line is called an angle of :
(A) Depression (B) Elevation (C) Allied (D) Quadrental

5) Period of $\csc\theta$ is : (A) π (B) $-\pi$ (C) 2π (D) -2π

6) $\text{Cos}(\theta - 180^\circ) =$: (A) $\text{Sin}\theta$ (B) $-\text{Cos}\theta$ (C) $\text{Cos}\theta$ (D) $-\text{Sin}\theta$

7) $\frac{9\pi}{5}\ rad$ in degree measure is : (A) 321° (B) 322° (C) 323° (D) 324°

8) Total number of terms in expansion of $\left(\frac{x}{2} - \frac{2}{x^2}\right)^{16}$ are :
(A) 17 (B) 16 (C) 15 (D) 14

9) The Statement $4^k > 3^k + 4$ is true for : (A) $K < 2$ (B) $K \leq 2$ (C) $K \neq 2$ (D) $K \geq 2$

10) A die is thrown, what is the probability to get 3 dots :
(A) $\frac{1}{3}$ (B) $\frac{1}{6}$ (C) $\frac{2}{3}$ (D) $\frac{5}{6}$

11) $\frac{8!}{7!} =$ (A) $7!$ (B) 7 (C) 8 (D) $8!$

12) If H is H.M. between " a " and " b " then H = : (A) $\frac{2ab}{a+b}$ (B) $\frac{a+b}{2ab}$ (C) $\frac{a+b}{2}$ (D) $\pm\sqrt{ab}$

13) If $a_n = \frac{(-1)^{n+1}}{2^n}$, then $a_5 =$: (A) $\frac{1}{8}$ (B) $\frac{1}{16}$ (C) $\frac{1}{32}$ (D) $\frac{1}{64}$

14) In $\frac{P(x)}{Q(x)}$, if degree of $P(x) \geq$ degree of $Q(x)$, then fraction is :
(A) Proper (B) Improper (C) Irrational (D) Identity

15) When $x^3 - 2x^2 + 3x + 3$ is divided by $x - 3$, the remainder is :
(A) -21 (B) 21 (C) -51 (D) 51

16) An equation which remains unchanged when x is replaced by $\frac{1}{x}$ is :
(A) Exponential (B) Radical (C) Reducible (D) Reciprocal

17) If Order of $X = 3 \times 2$ and that of $A = 2 \times 2$ then order of $XA =$
(A) 3×2 (B) 2×3 (C) 2×2 (D) 3×3

18) The matrix $[\ a\ \ b\ \ c\ \ d\ ]$ is : (A) Square (B) Unit (C) Null (D) Row

19) If $A = \{a, \{a, b\}\}$, then number of elements in $P(A)$ is : (A) 2 (B) 3 (C) 4 (D) 8

20) The property used in $(a+1) + \frac{3}{4} = a + (1 + \frac{3}{4})$ is :
B
(A) Closure (B) Associative (C) Commutative (D) Additive

BUNP-11-19

Roll No.	1117 - 30000	Session (2015 -17) to (2018 - 20)	Inter (Part - I)
Mathematics (Subjective)	Inter - A -2019	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.

Part - I — 25 x 2 = 50

Q.2	(i)	If Z_1 and Z_2 are complex numbers then show that $\overline{Z_1 Z_2} = \overline{Z_1}\,\overline{Z_2}$			
	(ii)	If $A = \begin{bmatrix} 2 & 3 & -2 \\ -1 & 1 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -3 & 1 \\ 5 & 4 & -1 \end{bmatrix}$ then solve the equation $3x - 2A = B$ for X.			
	(iii)	Separate into Real and Imaginary Parts $\frac{2-7i}{4+5i}$	(iv)	If A and B are Overlapping Sets then draw the Venn Diagram of A - B	
	(v)	Find the Multiplicative Inverse of -3 - 5i	(vi)	Find Four 4^{th} Roots of 81	
	(vii)	Define Intersection of two sets and give an example.	(viii)	Without expansion show that : $\begin{vmatrix} 2 & 3 & -1 \\ 1 & 1 & 0 \\ 2 & -3 & 5 \end{vmatrix} = 0$	
	(ix)	Define Identity Matrix and give an example.	(x)	Show that the roots of $px^2 - (p-q)x - q = 0$ are rational.	
	(xi)	If α, β are the roots of $x^2 - px - p - c = 0$ then prove that $(1+\alpha)(1+\beta) = 1 - c$	(xii)	Define Monoid.	
Q.3	(i)	For the identity $\frac{1}{(x-1)(2x-1)(3x-1)} = \frac{A}{x-1} + \frac{B}{2x-1} + \frac{C}{3x-1}$ calculate the value of A			
	(ii)	Find the indicated term of the sequence : 2, 6, 11, 17, ------- a_7			
	(iii)	Write the first four terms of the A.P. if $a_1 = 5$ and other three consecutive terms are 23, 26, 29			
	(iv)	Find the 12^{th} term of the Geometric Sequence : 1 + i, 2i, - 2 + 2i, -------			
	(v)	The A.M. between two numbers a and b is 5 and their positive G.M. is 4, find the values of a and b.			
	(vi)	If 5 is the Harmonic Mean between 2 and b, find b.			
	(vii)	How many words can be formed from the letters of the word " OBJECT " using all letters without repeating any letter?			
	(viii)	Prove that $\frac{8 \times 10^n - 2}{6}$ is an integer for n = 1 and n = 2.			
	(ix)	Find 6^{th} term in the expansion of $(x^2 - \frac{3}{2x})^{10}$			
	(x)	Expand $\sqrt{99}$ by using Binomial Expansion to find its value upto three places of decimals.			
	(xi)	Define Improper Rational Fraction.			
	(xii)	Resolve $\frac{1}{x^2 - 1}$ into Partial Fractions.			
Q.4	(i)	Define Degree Measure.	(ii)	Solve $\sin x = \frac{1}{2}$	
	(iii)	Find the solutions in $[0, 2\pi]$ $\cot\theta = \frac{1}{\sqrt{3}}$	(iv)	Prove $\frac{\sin 8x + \sin 2x}{\cos 8x + \cos 2x} = \tan 5x$	
	(v)	Prove that $\cos(\sin^{-1} x) = \sqrt{1 - x^2}$	(vi)	Find the period of $\cot\frac{x}{2}$	
	(vii)	If $\sin\theta = -\frac{1}{2}$, terminal arm of θ is not in III Quadrant, find $\tan\theta$.			
	(viii)	The area of a ΔABC is 2437. If a = 79 and c = 97, find the angle β.			
	(ix)	Prove that $\Delta = \sqrt{s(s-a)(s-b)(s-c)}$			
	(x)	Prove that $(\sec\theta - \tan\theta)^2 = \frac{1-\sin\theta}{1+\sin\theta}$			
	(xi)	Prove $\sin(\alpha+\beta).\sin(\alpha-\beta) = \sin^2\alpha - \sin^2\beta$			
	(xii)	If $\beta = 52^\circ$, $\gamma = 89^\circ 35'$, a = 89.35 find the side b of a ΔABC			
	(xiii)	Prove $\sqrt{\frac{1+\sin\alpha}{1-\sin\alpha}} = \frac{\sin\frac{\alpha}{2} + \cos\frac{\alpha}{2}}{\sin\frac{\alpha}{2} - \cos\frac{\alpha}{2}}$			

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Part - II

5	(a)	Convert $(A \cup B) \cup C = A \cup (B \cup C)$ to logical form and prove by constructing truth table.	(5)
	(b)	Sum to n terms, the series : $3 + 33 + 333 +$ ----------	(5)
6	(a)	Solve the equations if possible by Cramer's Rule. $2x_1 - x_2 + x_3 = 8$ $x_1 + 2x_2 + 2x_3 = 6$ $x_1 - 2x_2 - x_3 = 1$	(5)
	(b)	Find the Probability that sum of dots appearing in two successive throws of two dice is every time 7.	(5)
7	(a)	Find the values of "a" and "b" if "-2" and "2" are the roots of polynomial $x^3 - 4x^2 + ax + b$	(5)
	(b)	Find the Coefficient of term involving x^{-1} in the expansion of $(\frac{3}{2}x - \frac{1}{3x})^{11}$	(5)
8	(a)	Show that the area of a sector of a circular region of radius "r" is $\frac{1}{2}r^2\theta$, where θ is the circular measure of the central angle of the sector.	(5)
	(b)	Prove that $\frac{Cos8^o - Sin8^o}{Cos8^o + Sin8^o} = \tan 37^o$	(5)
9	(a)	Show that $\frac{1}{2rR} = \frac{1}{ab} + \frac{1}{bc} + \frac{1}{ca}$	(5)
	(b)	Prove that $\text{Sin}^{-1}\frac{5}{13} + \text{Sin}^{-1}\frac{7}{25} = \text{Cos}^{-1}\frac{253}{325}$	(5)