

**Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University) Coimbatore-641 043
Bachelor's Degree Examination – NOVEMBER 2018
I Semester**

Class : I UG

Time :3 hours

Major : B.Sc. Special Education and Mathematics

Max. Marks: 100

18BSMC02 – TRIGONOMETRY

Part-A

10 x 1=10

Choose the correct answer

1. The sum of the power of $\cos\theta$ and $\sin\theta$ in every term of the expansions equals

- (a) n (b) 0 (c) 1 (d) n + 1

2. The value of i^5 is _____


- (a) 0 (b) i (c) -i (d) -1

3. The value of $x + \frac{1}{x}$ is _____

- (a) $\cos\theta$ (b) $2\cos\theta$ (c) $\sin\theta$ (d) $2\sin\theta$

4. When n is even, the number of terms in the expansion of $\left(x + \frac{1}{x}\right)^n$ is _____

- (a) n (b) 0 (c) 1 (d) n + 1

5. $\cosh 2x =$ 

- (a) $1 + 2\cosh x$ (b) $1 + 2\sinh x$ (c) $1 + 2\sinh^2 x$ (d) $1 + 2\cosh^2 x$

6. $\log\left(x + \sqrt{x^2 - 1}\right) =$ _____

- (a) $\cosh x$ (b) $\cosh^{-1} x$ (c) $\sinh x$ (d) $\sinh^{-1} x$

7. If $z = e^u$ then $u =$ _____

- (a) z (b) 2z (c) -log z (d) log z

8. The real part of the logarithm of a complex quantity is the logarithm of its _____

- (a) amplitude (b) modulus (c) logarithm (d) values

9. The logarithm of a real positive quantity is _____ valued.

- (a) zero (b) many (c) single (d) two

10. $1 + \tan^2 x =$ _____

- (a) $\sec x$ (b) $\cot x$ (c) $\sec^2 x$ (d) $2\sec x$

Answer the following
Answer should not exceed 400 words or two pages

11. (a) Express $\cos 8\theta$ in terms of $\sin\theta$.
(or)
11. (b) Find the equation whose roots are $\tan \frac{\pi}{5}$, $\tan \frac{2\pi}{5}$, $\tan \frac{3\pi}{5}$ and $\tan \frac{4\pi}{5}$
12. (a) Expand $\sin^4\theta \cos^2\theta$ in a series of cosines of multiples of θ .
(or)
12. (b) Find $\lim_{\theta \rightarrow 0} \frac{n \sin\theta - \sin n\theta}{\theta(\cos\theta - \sin n\theta)}$.
13. (a) Express $\cosh^6 \theta$ in terms of hyperbolic cosines of multiples of θ .
(or)
13. (b) If $\sin(A + iB) = x + iy$, prove that $\frac{x^2}{\sin^2 A} - \frac{y^2}{\cos^2 A} = 1$.
14. (a) Find $\text{Log}(i - 1)$.
(or)
14. (b) Reduce $(\alpha + i\beta)^{x+iy}$ to the form $A + iB$.
15. (a) Find the sum of series
 $\cos^2 x + \cos^2(x + y) + \cos^2(x + 2y) + \dots$ upto n terms.
(or)
15. (b) Find the sum of n terms of the series
 $\sin \alpha - \sin(\alpha + \beta) + \sin(\alpha + 2\beta) + \dots$

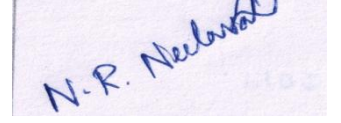
Part C

5 x 12=60

Answer the following
Answer should not exceed 800 words or four pages

16. (a) Express $\frac{\sin 6\theta}{\sin \theta}$ in terms of $\cos \theta$.
(or)
16. (b) Expand $\tan 4\theta$ in terms of $\tan \theta$ and show that $\tan \frac{\pi}{16}$, $\tan \frac{5\pi}{16}$, $\tan \frac{9\pi}{16}$, $\tan \frac{13\pi}{16}$ are roots of the equation $x^4 + 4x^3 - 6x^2 - 4x + 1 = 0$.
17. (a) Expand $\cos^6\theta$ in series of cosines of multiples of θ .
(or)
17. (b) Expand $\sin^7\theta$ in series of sines of multiples of θ .
18. (a) If $\cosh u = \sec \theta$, show that $u = \log \tan \left(\frac{\pi}{4} + \frac{\theta}{2} \right)$.
(or)
18. (b) Separate into real and imaginary parts $\tanh(1 + i)$.
19. (a) Show that $\log_i i = \frac{4n + 1}{4m + 1}$, where m and n are integers.
(or)
19. (b) Find the general value of $\text{Log}_{(-2)}(-2)$.
20. (a) Sum the series $\sinh x + \sinh(x + y) + \sinh(x + 2y) + \dots$ to n terms.
(or)
20. (b) Sum the series $\cosh x + \cosh(x + y) + \cosh(x + 2y) + \dots$ to n terms.

Name and Signature of the Examiner



N.R.NEELAVATHI