

**C****DE-2912****B. Sc. (Sem. I) Examination****March / April – 2016****Mathematics : MTH-101****(Trigonometry)**

Time : 2 Hours]

[Total Marks : 50

સૂચના / Instructions :

(૧)

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. Sc. (SEM. 1)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="MATHEMATICS - MTH-101"/>	<input type="text"/>
Subject Code No. : <input type="text" value="2"/> <input type="text" value="9"/> <input type="text" value="1"/> <input type="text" value="2"/>	<input type="text"/>
Section No. (1, 2,...): <input type="text" value="Nil"/>	<input type="text"/>
	Student's Signature

(૨) આ પ્રશ્નપત્રમાં કુલ ચાર વિભાગો A, B, C અને D થઈને 18 પ્રશ્નો છે.

(2) There are four sections in the question paper A, B, C and D having total 18 questions.

(૩) દરેક પ્રશ્નને ફક્ત એક જ સાચો ઉત્તર છે.

(3) There is only one correct answer for each question.

(૪) પ્રચલિત સંકેતોને અનુસરો

(4) Follow usual symbols.

SECTION - A : Q. 1 to 4 Multiple choice questions : (1 mark)**SECTION - B : Q. 5 to 8 Multiple Choice Questions : (2 marks)****SECTION - C : Q. 9 to 14 Multiple choice questions : (3 mark)****SECTION - D : Q. 15 to 18 Multiple Choice Questions : (5 marks)*****O.M.R. Sheet ભરવા અંગેની અગત્યની સૂચનાઓ આપેલ******O.M.R. Sheet-ની પાછળ છાપેલ છે.******Important instructions to fillup O.M.R. Sheet are given back side of provided O.M.R. Sheet.***

- 1 $\tan \alpha = \underline{\hspace{2cm}}$. (α રેડિયનમાં છે.)
 $\tan \alpha = \underline{\hspace{2cm}}$. (where α is in radian)

(A) $\alpha + \frac{\alpha^3}{3!} + \frac{2}{5!}\alpha^5 + \dots$

(B) $\alpha - \frac{\alpha^3}{3} + \frac{2}{15}\alpha^5 - \dots$

(C) $\alpha + \frac{\alpha^3}{3} + \frac{2}{15}\alpha^5 + \dots$

(D) $\alpha + \frac{\alpha^3}{3} + \frac{1}{15}\alpha^5 + \dots$

- 2 $e^{-i\theta} = \underline{\hspace{2cm}}$.

(A) $\sin \theta - i \cos \theta$

(B) $\cos \theta - i \sin \theta$

(C) $-\cos \theta - i \sin \theta$

(D) $\cos \theta + i \sin \theta$

- 3 $\text{Log}(i) = \underline{\hspace{2cm}}$.

(A) $\left(n + \frac{1}{2}\right)\pi i$

(B) $\left(2n + \frac{1}{4}\right)\pi i$

(C) $(2n+1)\frac{\pi}{2}i$

(D) $\left(2n + \frac{1}{2}\right)\pi i$

- 4 જો $x + \frac{1}{x} = 2 \cos 2\theta$ હોય, તો $x = \underline{\hspace{2cm}}$.

If $x + \frac{1}{x} = 2 \cos 2\theta$, then $x = \underline{\hspace{2cm}}$.

(A) $\cos 2\theta + i \sin 2\theta$

(B) $-\cos 2\theta + i \sin 2\theta$

(C) $-\cos 2\theta - i \sin 2\theta$

(D) $\sin 2\theta + i \cos 2\theta$

5 $\operatorname{cosech}^{-1} \frac{1}{2x\sqrt{1+x^2}} = \underline{\hspace{2cm}}$.

(A) $2\sinh^{-1} x$

(B) $2\operatorname{sech}^{-1} x$

(C) $2\cosh^{-1} x$

(D) $\sinh^{-1} 2x$

6 $2\sin^2(\alpha - i\beta)$ નો કાલ્પનિક ભાગ $\underline{\hspace{2cm}}$ છે.

Imaginary part of $2\sin^2(\alpha - i\beta)$ is $\underline{\hspace{2cm}}$.

(A) $-\sinh 2\alpha \sin 2\beta$

(B) $\sinh 2\alpha \sin 2\beta$

(C) $-\sin 2\alpha \sinh 2\beta$

(D) $\sin 2\alpha \sinh 2\beta$

7 $i^i =$ _____

(A) $e^{-\left(2n\pi - \frac{\pi}{2}\right)}$

(B) $e^{\left(2n\pi - \frac{\pi}{2}\right)}$

(C) $e^{\left(2n\pi + \frac{\pi}{2}\right)}$

(D) $e^{-\left(2n\pi + \frac{\pi}{2}\right)}$

8 $\frac{\left(\cos \frac{\pi}{3} - i \sin \frac{\pi}{3}\right)^{5/2}}{\left(\cos \frac{\pi}{3} + i \sin \frac{\pi}{3}\right)^{1/2}} =$ _____

(A) 0

(B) -1

(C) 1

(D) $\frac{1}{2}$

9 $\frac{\cosh A - \cosh 3A}{\cosh 4A - \cosh 6A} = \text{_____} .$

(A) $\frac{\sinh 5A - \sinh A}{\sinh 8A + \sinh 2A}$

(B) $\frac{\sinh 5A + \sinh A}{\sinh 8A + \sinh 2A}$

(C) $\frac{\sinh 5A - \sinh A}{\sinh 8A - \sinh 2A}$

(D) $\frac{\sinh 5A + \sinh A}{\sinh 8A - \sinh 2A}$

10 $\left\{ \sin(\alpha + \beta) - e^{\alpha i} \sin \beta \right\}^n = \text{_____} .$

(A) $\sin n\alpha \cdot e^{-n\beta i}$

(B) $\sin \alpha \cdot e^{-n\beta i}$

(C) $\sin^n \alpha \cdot e^{-n\beta i}$

(D) $\sin^n \alpha \cdot e^{n\beta i}$

11 જો $\sin(u + iv) = x + iy$ હોય, તો $\frac{x^2}{\sin^2 u} - \frac{y^2}{\cos^2 u} = \text{_____} .$

If $\sin(u + iv) = x + iy$, then $\frac{x^2}{\sin^2 u} - \frac{y^2}{\cos^2 u} = \text{_____} .$

(A) 2

(B) -1

(C) 0

(D) 1

12 $\log \frac{a+ib}{a-ib} = \underline{\hspace{2cm}}$.

(A) $i \tan^{-1} \frac{b}{a}$

(B) $2i \tan^{-1} \frac{b}{a}$

(C) $2i \tan^{-1} \frac{a}{b}$

(D) $i \tan^{-1} \frac{a}{b}$

13 $\tan 7\theta$ નું $\tan \theta$ ની પદાવલિમાં વિસ્તરણ $\underline{\hspace{2cm}}$ છે.

Expansion of $\tan 7\theta$ in terms of $\tan \theta$ is $\underline{\hspace{2cm}}$.

(A) $\frac{7\tan\theta - 35\tan^3\theta + 21\tan^5\theta - \tan^7\theta}{1 + 21\tan^2\theta - 35\tan^4\theta + 7\tan^6\theta}$

(B) $\frac{7\tan\theta - 35\tan^3\theta + 21\tan^5\theta - \tan^7\theta}{1 - 21\tan^2\theta + 35\tan^4\theta - 7\tan^6\theta}$

(C) $\frac{7\tan\theta + 35\tan^3\theta - 21\tan^5\theta + \tan^7\theta}{1 - 21\tan^2\theta + 35\tan^4\theta - 7\tan^6\theta}$

(D) $\frac{7\tan\theta - 35\tan^3\theta - 21\tan^5\theta - \tan^7\theta}{1 - 21\tan^2\theta - 35\tan^4\theta - 7\tan^6\theta}$

14 $\lim_{x \rightarrow 0} \left(\frac{\tan x}{x} \right)^{1/x} = \underline{\hspace{2cm}}$.

(A) -1

(B) e^{-1}

(C) 1

(D) e

15 $\sinh^{-1}\left(\frac{x}{\sqrt{1-x^2}}\right) = \text{_____}.$

(A) $\operatorname{cosec} h^{-1}x$

(B) $\cosh^{-1}x$

(C) $\tan^{-1}x$

(D) $\tanh^{-1}x$

16 જો $\tanh(u+iv) = \sin(x+iy)$ હોય, તો $\sin h2u \cdot \operatorname{cosec}2v = \text{_____}$

If $\tanh(u+iv) = \sin(x+iy)$, then $\sin h2u \cdot \operatorname{cosec}2v = \text{_____}.$

(A) $\tanh x \cot y$

(B) $\tan x \coth y$

(C) $\tanh x \coth y$

(D) $\tan x \cot y$

17 $\log \cos(x+iy)$ નો કાલ્પનિક ભાગ _____ છે.

Imaginary part of $\log \cos(x+iy)$ is _____.

(A) $-\tan^{-1}(\tan x \tanh y)$

(B) $\tan^{-1}(\tanh x \tan y)$

(C) $\tan^{-1}(\tan x \tanh y)$

(D) $-\tan^{-1}(\tanh x \tan y)$

18 $\{(\cos \theta + \cos \phi) + i(\sin \theta + \sin \phi)\}^n + \{(\cos \theta + \cos \phi) - i(\sin \theta + \sin \phi)\}^n = \underline{\hspace{2cm}}$

(A) $2^{n+1} \cos^n \frac{\phi - \theta}{2} \cdot \cos^n \left(\frac{\phi + \theta}{2} \right)$

(B) $2^{n+1} \cos^n \frac{\phi + \theta}{2} \cdot \cos^n \left(\frac{\theta - \phi}{2} \right)$

(C) $2^{n+1} \cos^n \frac{\theta - \phi}{2} \cdot \cos^n \left(\frac{\phi + \theta}{2} \right)$

(D) $2^{n+1} \cos^n \frac{\phi + \theta}{2} \cdot \cos^n \left(\frac{\phi + \theta}{2} \right)$