

**B****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 $e^{-i\theta} = \underline{\hspace{2cm}}$.
 (A) $\cos\theta - i\sin\theta$
 (B) $-\cos\theta - i\sin\theta$
 (C) $\cos\theta + i\sin\theta$
 (D) $\sin\theta - i\cos\theta$
- 2 $\text{Log}(i) = \underline{\hspace{2cm}}$.
 (A) $\left(2n + \frac{1}{4}\right)\pi i$
 (B) $(2n+1)\frac{\pi}{2}i$
 (C) $\left(2n + \frac{1}{2}\right)\pi i$
 (D) $\left(n + \frac{1}{2}\right)\pi i$
- 3 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) $\sin 2\theta + i\cos 2\theta$
 (D) $\cos 2\theta + i\sin 2\theta$
- 4 $\tan \alpha = \underline{\hspace{2cm}}$. (α રેડિયનમાં છે.)
 $\tan \alpha = \underline{\hspace{2cm}}$. (where α is in radian)
 (A) $\alpha - \frac{\alpha^3}{3} + \frac{2}{15}\alpha^5 - \dots$
 (B) $\alpha + \frac{\alpha^3}{3} + \frac{2}{15}\alpha^5 + \dots$
 (C) $\alpha + \frac{\alpha^3}{3} + \frac{1}{15}\alpha^5 + \dots$
 (D) $\alpha + \frac{\alpha^3}{3!} + \frac{2}{5!}\alpha^5 + \dots$

5 $2 \sin^2(\alpha - i\beta)$ નો કાલ્પનિક ભાગ _____ છે.

Imaginary part of $2 \sin^2(\alpha - i\beta)$ is _____.

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

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

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

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

6 $i^i =$ _____

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

7
$$\frac{\left(\cos \frac{\pi}{3} - i \sin \frac{\pi}{3}\right)^{5/2}}{\left(\cos \frac{\pi}{3} + i \sin \frac{\pi}{3}\right)^{1/2}} = \text{_____}$$

(A) -1

(B) 1

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

(D) 0

8
$$\operatorname{cosech}^{-1} \frac{1}{2x\sqrt{1+x^2}} = \text{_____} .$$

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

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

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

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

9 $\left\{ \sin(\alpha + \beta) - e^{\alpha i} \sin \beta \right\}^n = \underline{\hspace{2cm}} .$

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

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

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

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

10 જો $\sin(u + iv) = x + iy$ હોય, તો $\frac{x^2}{\sin^2 u} - \frac{y^2}{\cos^2 u} = \underline{\hspace{2cm}} .$

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

(A) -1

(B) 0

(C) 1

(D) 2

11 $\log \frac{a+ib}{a-ib} = \underline{\hspace{2cm}} .$

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

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

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

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

12 $\tan 7\theta$ નું $\tan\theta$ ની પદાવલિમાં વિસ્તરણ _____ છે.

Expansion of $\tan 7\theta$ in terms of $\tan\theta$ is _____.

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

13 $\lim_{x \rightarrow 0} \left(\frac{\tan x}{x} \right)^{1/x} = \text{_____} .$

(A) e^{-1}

(B) 1

(C) e

(D) -1

14 $\frac{\cosh A - \cosh 3A}{\cosh 4A - \cosh 6A} = \text{_____} .$

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

15 જો $\tanh(u + iv) = \sin(x + iy)$ હોય, તો $\sin 2u \cdot \operatorname{cosec} 2v = \underline{\hspace{2cm}}$

If $\tanh(u + iv) = \sin(x + iy)$, then $\sin 2u \cdot \operatorname{cosec} 2v = \underline{\hspace{2cm}}$.

(A) $\tan x \coth y$

(B) $\tanh x \coth y$

(C) $\tan x \cot y$

(D) $\tanh x \cot y$

16 $\log \cos(x + iy)$ નો કાલ્પનિક ભાગ $\underline{\hspace{2cm}}$ છે.

Imaginary part of $\log \cos(x + iy)$ is $\underline{\hspace{2cm}}$.

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

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

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

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

17 $\{(\cos \theta + \cos \phi) + i(\sin \theta + \sin \phi)\}^n + \{(\cos \theta + \cos \phi) - i(\sin \theta + \sin \phi)\}^n = \underline{\hspace{2cm}}$

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

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

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

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

18 $\sinh^{-1} \left(\frac{x}{\sqrt{1-x^2}} \right) = \underline{\hspace{2cm}} .$

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

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

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

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