



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

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

- (A)  $\alpha + \frac{\alpha^3}{3} + \frac{2}{15}\alpha^5 + \dots$   
(B)  $\alpha + \frac{\alpha^3}{3} + \frac{1}{15}\alpha^5 + \dots$   
(C)  $\alpha + \frac{\alpha^3}{3!} + \frac{2}{5!}\alpha^5 + \dots$   
(D)  $\alpha - \frac{\alpha^3}{3} + \frac{2}{15}\alpha^5 - \dots$

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

- (A)  $-\cos \theta - i \sin \theta$   
(B)  $\cos \theta + i \sin \theta$   
(C)  $\sin \theta - i \cos \theta$   
(D)  $\cos \theta - i \sin \theta$

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

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

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

(A) 1

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

(C) 0

(D) -1

6 
$$\operatorname{cosech}^{-1} \frac{1}{2x\sqrt{1+x^2}} = \text{_____} .$$

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

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

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

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

7  $2 \sin^2(\alpha - i\beta)$  નો કાલ્પનિક ભાગ \_\_\_\_\_ છે.

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

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

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

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

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

8  $i^i =$  \_\_\_\_\_

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

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

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

(A) 1

(B)  $e$

(C) -1

(D)  $e^{-1}$

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

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

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

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

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

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

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

13 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) 0

(B) 1

(C) 2

(D) -1

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

17 જો  $\tanh(u + iv) = \sin(x + iy)$  હોય, તો  $\sin 2u \cdot \operatorname{cosec} 2v =$  \_\_\_\_\_

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

(A)  $\tanh x \coth y$

(B)  $\tan x \cot y$

(C)  $\tanh x \cot y$

(D)  $\tan x \coth y$

18  $\log \cos(x + iy)$  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)  $\tan^{-1}(\tanh x \tan y)$