



RAN - 2003000201030033



RAN-2003000201030033

F. Y. B. Sc. (Sem. - I) Examination

March - 2023

Mathematics - I : (MTH - 101)

Time: 1 Hour]

[Total Marks: 50

સૂચના : / Instructions

(1)

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.

Fill up strictly the details of signs on your answer book

Name of the Examination:

F. Y. B. Sc. (Sem. - I)

Name of the Subject :

Mathematics - I : (MTH - 101)

Subject Code No.: 2003000201030033

Seat No.:

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------	----------------------	----------------------

Student's Signature

- (2) Follow usual notations and conventions.
- (3) There is no negative marking for wrong answer.
- (4) There are total 33 questions.
- (5) Section - I contains 16 MCQs (1 to 16) each of which carries a weightage of 1 mark.
- (6) Section - II contains 17 MCQs (17 to 33) each of which carries a weightage of 2 marks.

O.M.R. Sheet ભરવા અંગેની અગત્યની સૂચનાઓ આપેલ

O.M.R. Sheetની પાછળ છાપેલ છે.

***Important instructions to fillup O.M.R. Sheet
are given on back side of the provided O.M.R. Sheet.***

Section - I

Q. 1. $\cosh \frac{A}{2} = \underline{\hspace{2cm}}$.

A. $\sinh \frac{A}{2}$

B. $\pm \sqrt{\frac{1 + \cosh A}{2}}$

C. $\cosh A$

D. $2 \cosh A$

Q. 2. $\tanh^{-1}x + \tanh^{-1}y$ is equal to $\underline{\hspace{2cm}}$.

A. $\tanh^{-1}\left(\frac{x+y}{1+xy}\right)$

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

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

D. $\tanh^{-1}(1+xy)$

Q. 3. $\cosh^2\theta - \sinh^2\theta$ is equal to $\underline{\hspace{2cm}}$.

A. 1

B. 0

C. -1

D. 2

Q. 4. $(x + iy) \cdot (x - iy)$ is equal to $\underline{\hspace{2cm}}$.

A. x^2

B. $x^2 + y^2$

C. $x^2 - y^2$

D. y^2

Q. 5. $\operatorname{sech}^2u + \tanh^2u$ is equal to $\underline{\hspace{2cm}}$.

A. -1

B. 0

C. 1

D. 2

Q. 6. Real part of $e^{i\pi}$ is equal to $\underline{\hspace{2cm}}$.

$e^{i\pi}$ નો વાસ્તવિક ભાગ $\underline{\hspace{2cm}}$ છે.

A. -1

B. 0

C. 1

D. 2

Q. 7. $1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots + \frac{x^r}{r!} + \dots$, is the expansion of $\underline{\hspace{2cm}}$.

$1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots + \frac{x^r}{r!} + \dots$ એ $\underline{\hspace{2cm}}$ નું વિસ્તરણ છે.

A. $\log(x)$

B. $\sin(x)$

C. e^x

D. $\cos(x)$

Q. 8. $\tanh^{-1}\left\{\frac{x-a}{x+a}\right\} = \underline{\hspace{2cm}}$.

A. $\log \frac{x}{a}$

B. $\log \frac{x}{a^2}$

C. $\frac{1}{2} \log \frac{x}{a}$

D. $2 \log \frac{x}{a}$

Q. 9. $\tanh^{-1} x = \underline{\hspace{2cm}}$.

A. $\sinh^{-1} \frac{x}{\sqrt{1-x^2}}$

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

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

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

Q. 10. $[\cos \pi/4 + \sin \pi/4]^2 = \underline{\hspace{2cm}}$.

A. $-i$

B. 1

C. i

D. -1

Q. 11. $\tanh(ix) = \underline{\hspace{2cm}}$.

A. $i \tan x$

B. $\tan ix$

C. $-\tan x$

D. $-i \tan x$

Q. 12. $(\cos 2\theta + i \sin 2\theta)^{-2} = \underline{\hspace{2cm}}$.

A. $\cos 4\theta + i \sin 4\theta$

B. $\cos 4\theta - i \sin 4\theta$

C. $\cos 2\theta + i \sin 2\theta$

D. $\cos 2\theta + \sin 2\theta$

Q. 13. $\frac{e^x - e^{-x}}{2} = \underline{\hspace{2cm}}$.

A. $\cosh x$

B. $\sinh x$

C. $\tanh x$

D. $\coth x$

Q. 14. $\frac{2 \tan \theta}{1 - \tan^2 \theta} = \underline{\hspace{2cm}}$.

A. $\tan \theta$

B. $\tan 2\theta$

C. $-\tan \theta$

D. $-\tan 2\theta$

Q. 26. If $z = \cos 30^\circ + i \sin 30^\circ$ then $z^7 =$ _____.

જો $z = \cos 30^\circ + i \sin 30^\circ$ હોય તો $z^7 =$ _____.

A. $-\frac{\sqrt{3}}{2} + i\frac{1}{2}$

B. $\frac{\sqrt{3}}{2} + i\frac{1}{2}$

C. $-\frac{\sqrt{3}}{2} - i\frac{1}{2}$

D. $\frac{\sqrt{3}}{2} - i\frac{1}{2}$

Q. 27. If $x = \cos \theta + i \sin \theta$ then $\frac{x^2 - 1}{x^2 + 1} =$ _____.

જો $x = \cos \theta + i \sin \theta$ હોય તો $\frac{x^2 - 1}{x^2 + 1} =$ _____.

A. $\tan \theta$

B. $i \tan \theta$

C. $-\tan \theta$

D. $-i \tan \theta$

Q. 28. Expression of $\cos 4\theta$ in terms of $\cos \theta$ and $\sin \theta$ is _____.

$\cos 4\theta$ નું $\cos \theta$ અને $\sin \theta$ ના પદમાં વિસ્તરણ _____ છે.

A. $\cos^4 \theta + 6 \cos^2 \theta \sin^2 \theta + \sin^4 \theta$

B. $\cos^4 \theta - 6 \cos^2 \theta \sin^2 \theta + \sin^4 \theta$

C. $\cos^4 \theta + 4 \cos^2 \theta \sin^2 \theta + \sin^4 \theta$

D. $\cos^4 \theta - 4 \cos^2 \theta \sin^2 \theta + \sin^4 \theta$

Q. 29. $\cos 51^\circ =$ _____.

A. 0.6370

B. 0.6730

C. 0.6037

D. 0.6370

Q. 30. $\coth A(1 + \tanh^2 A) - \tanh A(1 + \coth^2 A) =$ _____.

A. -1

B. 0

C. 1

D. 2

Q. 31. If $x + iy = \sin(u + iv)$ then $\frac{x^2}{\cosh^2 v} + \frac{y^2}{\sinh^2 v} = \underline{\hspace{2cm}}$.

જો $x + iy = \sin(u + iv)$ હોય તો $\frac{x^2}{\cosh^2 v} + \frac{y^2}{\sinh^2 v} = \underline{\hspace{2cm}}$.

A. -1

B. 0

C. 1

D. 2

Q. 32. If $\tan(\alpha + i\beta) = x + iy$ then $x^2 + y^2 + 2x \cot 2\alpha = \underline{\hspace{2cm}}$.

જો $\tan(\alpha + i\beta) = x + iy$ હોય તો $x^2 + y^2 + 2x \cot 2\alpha = \underline{\hspace{2cm}}$.

A. 1

B. 0

C. -1

D. 2

Q. 33. $\cosh^{-1} x = \underline{\hspace{2cm}}$.

A. $\ln(x + \sqrt{x^2 - 1})$

B. $\ln(x - \sqrt{x^2 - 1})$

C. $\ln(x + \sqrt{x^2 + 1})$

D. $\ln(x - \sqrt{x^2 + 1})$

SPACE FOR ROUGH WORK