

Roll No.

Total No. of Pages : 02

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B.Tech.(AI & ML/CSE/DS/AI&DS/IOT/Internet of Things and Cyber Security including Block Chain Technology) (Sem.-3)

MATHEMATICS-III

Subject Code : BTAM304-18

M.Code : 76438

Date of Examination:04-12-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION-A

- 1. Answer the following :**

- State Euler theorem.
- $\sin(y - px) = 2p$
- Find P.I of $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 5y = \sin 3x$.
- State logarithmic test.
- Explain conditionally convergent series.
- If $z = f\left(\frac{y}{x}\right)$, then find $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}$.
- Evaluate $\int_0^1 \int_1^4 y \, dx dy$.
- State Cauchy sequence.
- State Cauchy's linear equation.
- Find the general solution of $(D^3 + 1)y = 0$

SECTION - B

2. Test the convergence of $\sum_{n=2}^{\infty} \frac{1}{[\log(\log n)]^n}$.
3. Solve $xp^2 - 2yp + ax = 0$.
4. Solve the differential equation $\frac{d^4 y}{dx^4} - y = \cos x \cosh x$.
5. Evaluate by change of order of integration $\int_0^1 \int_0^{\sqrt{1-y^2}} (x^2 + y^2) dx dy$.
6. The convergence or divergence of the series. $\sum_{n=2}^{\infty} \frac{n + \sqrt{n}}{n^2 - n}$

SECTION - C

7. Solve $\frac{d^2 y}{dx^2} + 3\frac{dy}{dx} + 2y = \sin e^x$ using method of variation of parameters.
8. Solve $y = xp^2 + p$.
9. The temperature 'T' at any point (x, y, z) in space is $400xyz^2$. Find the highest temperature on the surface of unit sphere $x^2 + y^2 + z^2 = 1$.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.