

Roll No.....

B.Tech.
2023
Ist Sem.

Department of Food Technology
School of Interdisciplinary Sciences and Technology
Jamia Hamdard, New Delhi-110062

End Sem Examination
April, 2023. B.Tech 1st Semester
Paper Title: Applied Physics; Paper Code: BFTC – 102

Time Allotted: 3Hrs.

Max Marks: 60

Note: Write to the point. Before answering make sure you have mentioned the Question No.

Section-A (12 Marks, Attempt All)

- Q1. Differentiate the function... $y = \sin(2x + 3)$ Co1 (2)
- Q2. Integrate... $\int \cos 3x \, dx$ Co1 (2)
- Q3. Given Two Matrix $A = \begin{pmatrix} 2 & 4 \\ 5 & 7 \end{pmatrix}, B = \begin{pmatrix} 3 & 4 \\ -2 & 7 \end{pmatrix}$ Find $A+B$ Co1 (2)
- Q4. What do you understand by homogeneous equation. Co1 (2)
- Q5. Give an example of partial differential equation. Co1 (2)
- Q6. Differentiate the function $y = x^2 + x^3 + x^5$ Co1 (2)

Section- B (Attempt any 3) (6 Marks Each)

- Q7. Given Matrix $A = \begin{pmatrix} 1 & 1 & 1 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{pmatrix}$. Find $A^2 - 4A - 5I$ Co2 (6)
- Q8. $y = \sin(ax+b)/\cos(cx+d)$
Find dy/dx Co2 (6)
- Q9. Integrate $\int x \cos x \, dx \longrightarrow$ Co2 (6)
- Q10. Evaluate $\int_0^1 5x \sqrt{x^2 - 1} \, dx$. Co2 (6)

Section C (Attempt any 2) (15 Marks Each)

- Q11. Find the Eigen values and Eigen vectors of the Matrix Co3 (15)
- $$\begin{pmatrix} 1 & 2 & -2 \\ 1 & 1 & 1 \\ 1 & 3 & -1 \end{pmatrix}$$
- Q12. If $x = r \cos \theta, y = r \sin \theta$ Find $\partial(x, y)/\partial(r, \theta)$ And $\partial(r, \theta)/\partial(x, y)$ Co3 (15)
- Q13. Solve the simultaneous equation with the help of Matrices Co3 (15)
- $$\begin{aligned} x + y + z &= 3 \\ x + 2y + 3z &= 4 \\ x + 4y + 9z &= 6 \end{aligned}$$