

ARJEC/IQAC/QP/03

AJAY KUMAR GARG ENGINEERING COLLEGE, GHAZIABAD
DEPARTMENT OF INFORMATION TECHNOLOGY

Sessional Test

Program: B. Tech
 Session: 2025-26

Subject: MATHEMATICS-IV
 Max. Marks: 50

Semester: III
 Section: ECE-1,2,3, IT-1,2,3,
 CSIT-1,2, EN, ME
 Subject Code: BAS-303
 Time: 2 Hours

OBE Remarks:

Q.No	1	2	3	4	5	6	7	8	9	10	11	12
CO No.	CO1	CO1	CO2	CO2	CO3	CO1	CO1	CO2	CO2	CO3	CO1	CO2
Bloom's Level* (L1 to L6)	L2	L4	L2	L1	L5	L3	L6	L4	L5	L3	L4	L5
Weightage CO1: 21.5				Weightage CO2: 21.5				Weightage CO3: 7				

*Bloom's Level: L1: Remember, L2: Understand, L3: Apply, L4: Analyze, L5: Evaluate, L6: Create

Note: Answer **all** the sections with all the questions

Section-A

(2*5=10)

- Form the PDE from $z = y^2 + 2f\left(\frac{1}{x} + \log y\right)$.
- Find C.F. $(D^2 + DD' + D' - 1)z = 0$
- Find Normal equation of $y = \frac{C_0}{x} + C_1\sqrt{x}$
- Find the difference between curve fitting & regression
- If $F(e^{-x^2}) = \sqrt{\pi}e^{-\left(\frac{p^2}{4}\right)}$, then find Fourier transform of $e^{-\frac{x^2}{2}}$

Section-B

(5*5=25)

- Solve $(x^2D^2 + 2xyDD' + y^2D'^2)z = x^n y^m$
- Solve the partial differential equation: $(x^2 - y^2 - yz)p + (x^2 - y^2 - zx)q = z(x - y)$
- The following results were obtained from marks in Mechanics and Mathematics in an examination:

	Mechanics(x)	Mathematics (y)
Mean	47.5	39.5
Standard Deviation	16.8	10.8

and $r = 0.95$.

Find both regression equations. Also estimate the value of y for $x=30$.

- The pressure of the gas corresponding to various volumes V is measured, given by the following data:

$V(\text{cm}^3)$	50	60	70	90	100
$P(\text{kg cm}^{-2})$	64.7	51.3	40.5	25.9	78

Fit the data to the equation $PV^{\gamma} = k$.

10. Find Fourier sine transform of $\frac{e^{-\alpha x}}{x}$, $\alpha > 0$

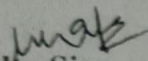
Section-C

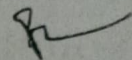
(7.5*2=15)

11. Solve the following equation by Charpit's method

$$(p^2 + q^2)x = pz$$

12. Define coefficient of Skewness. The first four moments about the working mean 28.5 of a distribution are 0.294, 7.144, 42.409 and 454.98. Calculate the moments about mean and comment upon the skewness and kurtosis of the distribution.


Faculty Sign


HoD Sign