

CITY COLLEGE

B.Sc., Tutorial Assessment - 2021

F.M = 15

MTMG, Sem - III

Mathematics - GE3

Answer any 3 questions of the following: $5 \times 3 = 15$

1. Prove that $\int \tan^4 x \, dx = \frac{\tan^3 x}{3} - \tan x + x + c.$

Hence find $\int_0^{\pi/4} \tan^4 x \, dx$

2. Prove that $\lim_{n \rightarrow \infty} \left\{ \left(1 + \frac{1}{n}\right) \left(1 + \frac{2}{n}\right) \dots \left(1 + \frac{n}{n}\right) \right\}^{\frac{1}{n}} = 4/e.$

3. Find the polynomial $f(x)$, which satisfies the following data:

x	-1	0	1	2
f(x)	1	1	1	-5

4. Find the initial basic feasible solution of the following balanced transportation problem:

Destinations \rightarrow	D ₁	D ₂	D ₃	D ₄	
Source					
O ₁	21	16	25	13	11
O ₂	17	18	14	23	13
O ₃	32	27	18	41	19
	6	10	12	15	

5. Solve the following assignment problems:

		Persons			
		A	B	C	D
Jobs	I	9	6	6	5
	II	8	7	5	6
	III	8	6	5	7
	IV	9	9	8	8