

CITY COLLEGE

Internal Examination - 2021

B.Sc, Mathematics (GEN), SEM - III

MTMG, Paper: GE3

F.M = 10

Time: 30 minutes

[Answer all the following questions]

1. Evaluate  $\lim_{n \rightarrow \infty} \frac{1 + 2^{10} + 3^{10} + \dots + n^{10}}{n^{11}}$ , whose value is

- (a)  $\frac{2}{10}$  (b)  $\frac{1}{11}$  (c)  $\frac{2}{11}$  (d) 1

[1]

2. Integrate the definite integral  $\int_0^{\pi/4} \tan^4 x dx$ , which equals to

- (a)  $\frac{\pi}{4} - \frac{1}{3}$  (b)  $\frac{2}{3} - \frac{\pi}{4}$  (c) 0 (d)  $\frac{\pi}{4} - \frac{2}{3}$

[1]

3. Evaluate  $\int_0^{\infty} e^{-x} x^{3/2} dx$ , whose value is

- (a)  $\sqrt{\pi}$  (b)  $\frac{3}{4}\sqrt{\pi}$  (c)  $\frac{\sqrt{\pi}}{2}$  (d) none of these

[1]

4. Using Beta and Gamma function, evaluate

$\int_0^1 x(1-x)^{99} dx$ , which is equal to

[2]

- (a)  $\frac{1}{10100}$  (b)  $\frac{1}{10200}$  (c)  $\frac{1}{10101}$  (d)  $\frac{1}{10000}$

Evaluate  $\int_0^{\pi/2} \int_0^{\pi/2} \cos(x+y) dx dy$ , which is equal to

[2]

- (a) 1 (b) 2 (c) 0 (d) none of these

5. The solution of a transportation problem is

- (a) always bounded (b) never unbounded

- (c) bounded or unbounded (d) none of these

[1]

6. In a transportation problem, the number of cell required for forming a loop is

- (a) even (b) odd (c) prime (d) none of these [1]

7. The number of non-basic variables in a balanced transportation problem with  $m$  origins and  $n$  destinations is

- (a)  $mn$  (b)  $m+n-1$  (c)  $mn - (m+n-1)$  (d)  $m+n$  [1]

8. Using Hungarian method minimum cost of the following assignment problem is

		$w_1$	$w_2$	$w_3$	
Workers	A	3	10	3	is
	B	8	7	9	
	C	5	7	5	

- (a) 15 (b) 16 (c) 17 (d) 14 [2]

or

If the relative error in 2.13561 is  $7 \times 10^{-6}$  then the number of correct digits of the number is

- (a) 4 (b) 5 (c) 3 (d) 6 [2]