

CITY COLLEGE

Internal Examination - 2021

FM = 10

B.Sc (GEN), Semester - VI, MTMG

Time : 30 minutes

Paper : DSE-B Paper Code : MTMG-DSE-B-TH

[Advanced Calculus]

Answer all the following questions :

1 × 10 = 10

1. If $F(t) = c$, a constant, then Laplace transform of the function $F(t)$ is

- (a) $\frac{c}{p}$ (b) 0 (c) $\frac{1}{p}$ (d) $\frac{c}{p^2}$

2. $L\{\cos at\}$ is

(a) $\frac{1}{p^2 + a^2}$, $p > 0$ (b) $\frac{p}{p^2 + a^2}$, $p > 0$

(c) $\frac{a^2}{p^2 + a^2}$, $p > 0$ (d) $\frac{a}{p^2 + a^2}$, $p > 0$

3. $L^{-1}\left(\frac{1}{p^3}\right) = ?$

(a) $\frac{1}{p}$ (b) t^2 (c) $\frac{t^2}{2!}$ (d) $\frac{t^3}{3!}$

4. $L^{-1}\left\{\frac{1}{(p-1)(p-2)}\right\}$ is equal to

(a) e^{2t} (b) e^t (c) $e^{2t} + e^t$ (d) $e^{2t} - e^t$

5. If $f(x)$ is an odd function then $\int_{-\pi}^{\pi} f(x) \cos nx \, dx$ is equal to

(a) 0 (b) π (c) $\frac{\pi}{2}$ (d) does not exist

6. If $f(x)$ is an even function and $f(x)\sin nx$ is odd then $\int_{-\pi}^{\pi} f(x)\sin nx dx$ is equal to

(a) $2 \int_{-\pi}^{\pi} f(x)\sin nx dx$ (b) 0 (c) π (d) $\frac{\pi}{2}$

7. If $f_n(x) = \frac{x}{1+nx}$, $0 \leq x < \infty$ then $\{f_n\}$ converges to (a) 1 (b) $\frac{1}{2}$ (c) 0 (d) π

8. The series $\sum_{n=1}^{\infty} (-1)^n \cdot \frac{x^n}{n}$ is

- (a) absolutely converges (b) not uniformly converges
(c) uniformly and absolutely converges
(d) uniformly but not absolutely converges

9. The radius of converges of the series $\sum_{n=1}^{\infty} \frac{x^n}{n}$ is

- (a) 1 (b) 0 (c) 2 (d) does not exist

10. The value of the series

$$1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \dots \text{ is equal to}$$

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

N.B: Submit your answer scripts through e-mail.

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