

Div-6

(Beta &amp; Gamma function)

16/02/22 Class Test - 1 [20 marks]

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Q.1  $\int_0^1 x^4 (1-x)^3 dx = \dots$

- a)  $\frac{1}{24}$  b)  $\frac{1}{280}$  c) 24 d) 280

Q.2  $\int_0^\infty x^3 e^{-x} dx = \dots$

- a)  $\sqrt{\pi}$  b)  $\frac{1}{6}$  c) 6 d)  $\sqrt{\frac{1}{2}}$

Q.3 If  $0 < n < 1$ , then  $\Gamma(n) \cdot \Gamma(1-n)$  is equal to  
 a) 1 b)  $\frac{1}{2}\pi$  c)  $\sin n\pi$  d)  $\frac{\pi}{\sin n\pi}$

Q.4  $\int_0^1 (x \log x)^4 dx$

- a) 4! b) 5! c)  $\frac{4!}{5^5}$  d)  $\frac{5!}{4^5}$

Q.5  $\int_0^{\pi/2} \sqrt{\tan \theta} d\theta = \dots$

- a)  $\sqrt{\pi}$  b)  $\sqrt{\frac{\pi}{2}}$  c)  $\frac{\pi}{\sqrt{2}}$  d)  $\sqrt{\frac{1}{2}}$

Q.6  $\Gamma\left(-\frac{5}{2}\right) = \dots$

- a)  $\frac{15}{8}$  b)  $-\frac{8}{15}$  c)  $\frac{15}{8}\sqrt{\pi}$  d)  $-\frac{8}{15}\sqrt{\pi}$

Q.7  $\int_0^2 (4-x^2)^{3/2} dx = \dots$

- a)  $\pi$  b)  $2\pi$  c)  $3\pi$  d)  $\pi/2$

Q.8  $\int_0^{\infty} \frac{x dx}{1+x^6} = \dots$

- a)  $\frac{\pi}{3\sqrt{3}}$  b)  $\frac{\pi}{3}$  c)  $\frac{\pi}{2}$  d)  $\pi$

5 - (incomplete)

9  $B(m, n) = \dots$

(m-1)! (n-1)!  $\quad \text{(b) } B(n, m)$

(a)  $\frac{(m+n-1)!}{(m+n-1)!}$

(c) both (a) & (b)

(d) None of the above

10  $\int_0^\infty 4 \cdot x^4 \cdot e^{-x^4} dx$

(a)  $\sqrt{n}$

(b)  $\sqrt{\frac{5}{4}}$

(c)  $\sqrt{\frac{4}{5}}$

(d) None of the above