HNB Garhwal University Srinagar-246174 (Garhwal) Uttarakhand

Sample Question Paper

Integral Calculus

B.A./B.Sc. VIthSemester

2020

Q. 1. If n be a positive and odd integer then the value of $\int_0^{\Pi/2} Cos^n x\, dx$ is

(a) $\frac{n-1}{n}.\frac{n-3}{n-2}\ldots\frac{n-5}{n-4}.\frac{2}{3}\pi$ (b) $\frac{n-1}{n}.\frac{n-3}{n-2}\ldots\frac{n-5}{n-4}.\frac{2}{3}\frac{2}{\pi}$

(c) $\frac{n-1}{n}.\frac{n-3}{n-2}\ldots\frac{n-5}{n-4}.\frac{2}{3}$ (d) None of these.

Q. 2. $\int_0^{2a}\phi(x)dx = 2\int_0^{a}\phi(x)dx$ if

(a) $\phi(2a+x)=\phi(x)$ (b) $\phi(2a-x)=-\phi(x)$

(c) $\phi(2a-x)=\phi(x)$ (d) None of these.

Q. 3. Which of the following relation is true

(a) $\int\int_A f(x,y)dxdy = \int\int_A f(r\cos\theta, r\sin\theta)d\theta dr$

(b) $\int\int_A f(x,y)dxdy = \int\int_A f(r\sin\theta, r\cos\theta)d\theta dr$

(c) $\int\int_A f(x,y)dxdy = \int\int_A f(r\sin\theta, r\cos\theta)rd\theta dr$

(d) None of these.

Q. 4. Quadrature is the process of determining the

(a) Length of arc of plane curves (b) Area under plane curves

(c) Intrinsic equation from the polar equation of curve

(d) None of these.

Q. 5. The volume of the solid generated by revolution about the y-axis of the area bounded by the curve $x = f(y)$, the y-axis and the abscissae $y = a$ to $y = b$ is

(a) $\int_a^b \pi y^2 dx$ (b) $\int_a^b \frac{1}{2}\pi x^2 dy$

(c) $\int_a^b \pi x^2 dy$ (d) None of these.

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Sample Question Paper

Complex Analysis

B.A./B.Sc.VIthSemester

2020

1. The polar form of the complex number $z = -1 - i$ is

(a). $z = \sqrt{2}e^{-i3\pi/4}$

(b). $z = \sqrt{2}e^{i3\pi/4}$

(c). $z = \sqrt{2}e^{-i\pi/4}$

(d). $z = \sqrt{2}e^{i\pi/4}$

2. If $f(z) = u + v$, be an analytic function and $|f(z)|$ is constant then which of the following is not true:

(a). $f(z)$ is constant

(b). $f(z)$ need not be constant

(c). u is constant

(d). v is constant

3. If $f(z) = u + v$, be an analytic function and$u = x^2 - y^2$ then $v\ is$:

(a). $v = xy$ + constant

(b). $v = 2xy$ + constant

(c). $v = -xy$ + constant

(d). $v =$ constant

4. The value of $\int_C \bar{z}\ dz$ if $C: z = e^{it}, 0 \leq t \leq \pi$ is:

(a). $i\pi$

(b). $-i\pi$

(c). π

(d). 0

5. The possible Taylor or Laurent series of the function $f(z) = \frac{2z}{(z-1)(z-2)}$ in the region $0 \leq |z| \leq 1$ is:

(a). $f(z) = 2\sum_{n=0}^{\infty}\left(1 - \frac{1}{2^n}\right)z^n$

(b). $f(z) = 2\sum_{n=0}^{\infty}\left(1 + \frac{1}{2^n}\right)z^n$

(c). $f(z) = \sum_{n=0}^{\infty}\left(1 - \frac{1}{2^n}\right)z^n$

(d). $f(z) = \sum_{n=0}^{\infty}\left(1 + \frac{1}{2^n}\right)z^n$

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Sample Question Paper

Vector Calculus

B.A./B.Sc. VIthSemester

2020

Q. 1. If $A = 2i + 3j + 4k,\ B = i + j - k,\ C = i - j + k$ then $A \times (B \times C)$ is

(a) $2i - 4j + 4k$ (b) $2i + 4j + 4k$
(c) $2i - 4j - 4k$ (c) $2i + 4j - 4k$

Q. 2. The necessary and sufficient condition for the vector $\vec{a}(t)$ have a constant direction is

(a) $\vec{a}.\frac{d\vec{a}}{dt} = 1$ (b) $\vec{a}.\frac{d\vec{a}}{dt} = 0$
(c) $\vec{a} \times \frac{d\vec{a}}{dt} = 0$ (d) $\vec{a} \times \frac{d\vec{a}}{dt} = 1$

Q. 3. If $\vec{r} = xi + yj + zk, \vec{a}$ is any vector, then $div(\vec{r} \times \vec{a})$ is

(a) 1 (b) 2
(c) 3 (c) 0

Q. 4. If $\vec{r} = xi + yj + zk, \hat{r}$ is unit vector of $\vec{r}$. Then $div(\hat{r})$ is

(a) $\frac{1}{|\vec{r}|}$ (b) $\frac{2}{|\vec{r}|}$
(c) $\frac{3}{|\vec{r}|}$ (d) None of the above

Q. 5. The value of integral $\int_c F.dr$ where $F = (x^2 + y^2)i - 2xyj$, where c is the rectangle in the xy plane bounded by $y = 0, x = a, y = b, x = 0$, is

(a) $-2ab^2$ (b) $-2a^2b$
(c) $2a^2b$ (d) a^2b