Question Bank

School of Basics and Applied Science

**Mathematics**

Course Name: Multivariable Calculus Course Code: BBS01T1001

Unit-1

| Sl No. | Questions | CO | Bloom’s Taxonomy Level | Difficulty Level | Competitive Exam Question Y/N | Area | Topic |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1. 1 | Define sequence. | 1 | K1 | L | N | sequence | definition |
| 2 | Find the nth term of the sequence 1, -4, 9, -16, 25, … | 1 | K2 | M | N | sequence | notation |
| 3 | Define convergence of the sequence. | 1 | K1 | M | N | sequence | convergence |
| 4 | Explain the convergence of the sequence graphically. | 1 | K2 | M | N | sequence | convergence |
| 5 | Explain that the sequence is not convergent graphically. | 1 | K2 | M | N | sequence | convergence |
| 6 | Solve: | 1 | K3 | M | N | sequence | convergence |
| 7 | Solve: | 1 | K3 | M | N | sequence | convergence |
| 8 | Solve: | 1 | K3 | M | N | sequence | convergence |
| 9 | Define sequence of partial sum of series. | 1 | K1 | M | N | series | definition |
| 10 | Show that geometric series converges to for | 1 | K3 | H | N | series | Geometric series |
| 11 | Show that series is convergent and find its sum. | 1 | K3 | H | N | series | Geometric series |
| 12 | Show that series is convergent and find its limit. | 1 | K3 | H | N | series | Geometric series |
| 13 | Express the repeating decimal 5.232323… into ratio of two integers. | 1 | K2 | H | N | series | Geometric series |
| 14 | Show that the series is divergent. | 1 | K3 | H | N | series | nth term test |
| 15 | State the integral test. | 1 | K1 | M | N | Series | Integral test |
| 16 | Show that the ***p*-series**  (*p* a real constant) converges if, and diverges if . | 1 | K3 | H | N | series | p-series test |
| 17 | Show that the series is convergent. | 1 | K3 | H | N | series | Integral test |
| 18 | Show that the series is not convergent. | 1 | K3 | H | N | series | Integral test |
| 19 | Define absolutely convergent series. | 1 | K1 | M | N | series | absolutely convergent |
| 20 | State the ratio test. | 1 | K1 | M | N | series | Ratio test |
| 21 | Show that the series is convergent and its sum is. | 1 | K3 | H | N | series | Ratio test |
| 22 | Show that the series is not convergent. | 1 | K3 | H | N | series | Ratio test |
| 23 | State the root test. | 1 | K1 | M | N | series | Root test |
| 24 | Explain that the series is convergent. | 1 | K2 | H | N | series | Root test |
| 25 | Explain that the series is convergent. | 1 | K2 | H | N | series | Root test |
| 26 | Show that the series is not convergent. | 1 | K3 | H | N | series | Root test |
| 27 | Define alternating series and give an example. | 1 | K1 | M | N | Series | Alternating series |
| 28 | State the alternating series test. | 1 | K1 | M | N | series | Alternating series |
| 29 | Show that the series is convergent. | 1 | K3 | H | N | series | Alternating series |
| 30 | Define power series about. | 1 | K1 | M | N | Power series | Definition |
| 31 | Show that the power series converges to for. | 1 | K3 | H | N | Power series | convergence |
| 32 | Show that the power series converges for. | 1 | K3 | H | N | Power series | convergence |
| 33 | Show that the power series converges for. | 1 | K3 | H | N | Power series | convergence |
| 34 | Determine the interval and radius of convergence for the power series | 1 | K4 | H | N | Power series | convergence |
| 35 | Determine the interval and radius of convergence for the power series | 1 | K4 | H | N | Power series | convergence |
| 36 | Define the Taylor series generated by at | 1 | K1 | M | N | Taylor series | Definition |
| 37 | Define the Maclaurin series generated by at | 1 | K1 | M | N | Maclaurin series | Definition |
| 38 | Find the Maclaurin series generated by . | 1 | K2 | H | N | Maclaurin series | Expansion |
| 39 | Find the Maclaurin series generated by . | 1 | K2 | H | N | Maclaurin series | Expansion |
| 40 | Find the Taylor series generated by at | 1 | K3 | H | N | Taylor series | Expansion |
| 41 | Using known series, find the first few terms of the Maclaurin series for the function. | 1 | K2 | H | N | Maclaurin series | Expansion |
| 42 | Using known series, find the first few terms of the Maclaurin series for the function. | 1 | K2 | H | N | Maclaurin series | Expansion |
| 43 | Find the Fourier sine and cosine series of the function in the interval | 1 | K3 | H | N | Fourier series | Expansion |
| 44 | Find the Fourier sine and cosine series of the function in the interval | 1 | K3 | H | N | Fourier series | Expansion |
| 45 | Find the Fourier sine and cosine series of the function in the interval | 1 | K3 | H | N | Fourier series | Expansion |
| 46 | Find the Fourier sine and cosine series of the function . | 1 | K3 | H | N | Fourier series | Expansion |
| 47 | Solve: | 1 | K3 | H | Y | Sequence | Convergence |
| 48 | Find the interval of the convergence of the series | 1 | K3 | H | Y | series | convergence |
| 49 | Find the Fourier sine and cosine series of the function | 1 | K3 | H | Y | Fourier series | Expansion |
| 50 | What is the value of | 1 | K3 | M | Y | series | Geometric series |
| 51 | Find the radius of the convergence of the power series | 1 | K3 | H | Y | series | convergence |
| 52 | Solve: | 1 | K3 | M | Y | series | Telescoping series |