Sample questions of YMX0233 Mathematical Analysis II

1. Functions of several variables. Graph of function of two variables.
2. Partial increments and total increment of function several variables.
3. Limit of function of two variables.
4. Continuity of function of two variables.
5. Partial derivatives of functions of several variables.
6. Total increment and total differential.
7. Partial derivatives of functions given implicitly.
8. Partial derivatives of higher order.
9. Directional derivative.
10. Gradient.
11. Divergence and curl.
12. Local extrema of function of two variables.
13. Definition and properties of double integral.
14. Iterated integrals. Evaluation of double integral.
15. Evaluation of volumes and areas by double integrals.
16. Definition and properties of triple integral.
17. Evaluation of triple integral.
18. Line integral with respect to arc length.
19. Evaluation of line integral with respect to arc length.
20. Line integral with respect to coordinates.
21. Evaluation of line integral with respect to coordinates.
22. Green's formula.
23. Path independence of line integral.

24. Number series, partial sums and convergence. Examples. Necessary condition for convergence (an example).

25. Comparison test of positive number series (an example).

26. Alternating series. Leibnitz's test (an example).

27. Series with whatever signs. Absolute and conditional convergence (an example).