Answers:

1. Diverges.
(divergence test)

2. Converges absolutely.
(ratio test or integral test)

3. Converges absolutely.
(ratio test)

4. Converges absolutely.
First show $\sum \frac{2^n}{n!}$ converges using the ratio test, then compare the absolute value of our series to $\sum \frac{2^n}{n!}$ using term-size comparison.

5. Converges conditionally.
Use A.S.T to show convergence. Then take the absolute value and use L.C.T. (compare to $\sum b_n = \sum \frac{1}{n}$) to show convergence is NOT absolute.

6. Converges absolutely.
Compare to p-series $\sum \frac{1}{n^{3/2}}$ using term-size comparison.

7. Converges absolutely.
Take absolute value, use L.C.T., and compare to $\sum \frac{1}{n^3}$

8. Converges conditionally.
Use A.S.T to show convergence and L.C.T with $\sum \frac{1}{\sqrt{n}}$ to show convergence is not absolute.

9. Converges absolutely.
Take absolute value, then either: compare term-wise to $\sum \frac{\sqrt{n}}{n^2}$
or: use the integral test (integrate by parts with $u = \ln n$).

10. Diverges.
(divergence test)

11. Converges conditionally.
Use A.S.T to show convergence and then take absolute value and compare to $\sum \frac{1}{n}$ to show that convergence is not absolute (L.C.T.).

12. Converges absolutely.
Take absolute value, then compare to $\sum \frac{1}{n^{3/2}}$ using limit comparison

13. Converges absolutely.
Either compare to $\sum \frac{1}{n^2}$ using limit comparison, or compare to $\sum \frac{10}{n^2}$ using term-size comparison.

14. Diverges.
Use integral test (integrate by substition with $u = \ln n$).

15. Converges absolutely.
(ratio test)

16. Converges absolutely.
(Break the difference into two separate series, each is a geometric series, $|r| < 1$)

17. Diverges.
(divergence test)

18. Converges absolutely.
Compare to $\sum \frac{1}{n^{5/2}}$.

19. Diverges.
(ratio test, careful with the cancellations)

20. Converges absolutely.
Take absolute value and then compare to $\sum \frac{1}{2^n}$.

21. Converges absolutely.
(ratio test)