**Logical Functions: AND & OR**

**AND Function**

* **Syntax**: =AND(condition1, condition2, ...)
* **Purpose**: Returns **TRUE** if *all* conditions are **TRUE**, otherwise returns **FALSE**.
* **Example**: =AND(A2>50, B2="Pass")  
   Returns TRUE only if A2 > 50 **and** B2 = "Pass".

**OR Function**

* **Syntax**: =OR(condition1, condition2, ...)
* **Purpose**: Returns **TRUE** if *any* one of the conditions is **TRUE**, otherwise returns **FALSE**.
* **Example**: =OR(A2>50, B2="Pass")  
  Returns TRUE if either A2 > 50 **or** B2 = "Pass".

**Combining with IF**

* **Syntax**: =IF(AND(...), "Value if TRUE", "Value if FALSE")
* **Example**: =IF(AND(A2>50, B2="Pass"), "Promoted", "Not Promoted")

**Practice Questions (Use below data for Q1–Q15)**

| **Name** | **Marks1** | **Marks2** | **Attendance** | **Result** | **Grade** |
| --- | --- | --- | --- | --- | --- |
| Raj | 45 | 65 | 88 | Pass | B |
| Simran | 55 | 78 | 60 | Fail | C |
| Aman | 60 | 62 | 95 | Pass | A |
| Neha | 38 | 59 | 85 | Pass | B |
| Rohit | 80 | 49 | 70 | Pass | B |

**Q1–Q10: Using AND / OR**

1. Check if Marks1 > 40 **and** Marks2 > 60.
2. Check if Marks1 > 50 **or** Attendance > 90.
3. Check if Attendance is between 60 and 90.
4. Check if Result is "Pass" **and** Grade is "A".
5. Check if Marks1 < 50 **or** Result is "Fail".
6. Check if Marks2 >= 60 **and** Attendance >= 85.
7. Use AND to see if both marks are greater than 50.
8. Use OR to check if either mark is greater than 75.
9. Use AND to check if Attendance > 80 **and** Result is "Pass".
10. Use OR to check if Grade is "A" **or** "B".

**Q11–Q20: Combine IF + AND or IF + OR**

1. If Marks1 > 50 **and** Attendance > 80, return "Eligible", else "Not Eligible".
2. If Marks2 > 60 **or** Grade = "A", return "Good", else "Improve".
3. If Attendance < 70 **or** Result = "Fail", return "Not Promoted", else "Promoted".
4. If both Marks1 and Marks2 > 60, return "High Score", else "Low Score".
5. If Grade is not "A" **and** Marks1 < 60, return "Average", else "Topper".
6. If Attendance is between 80–100 and Result = "Pass", return "Final Eligible", else "Recheck".
7. If either mark is below 40, return "Fail", else "Pass".
8. If Marks1 > 40 and Grade = "B", return "Moderate", else "Check Again".
9. If both marks are above 70 and Attendance > 90, return "Excellent", else "Good".
10. If Result = "Pass" **and** (Grade = "A" **or** Attendance > 85), return "Award", else "No Award".

**SOLUTIONS**

**Q1–Q10: AND / OR Answers**

1. =AND(B2>40,C2>60)
2. =OR(B2>50,D2>90)
3. =AND(D2>=60,D2<=90)
4. =AND(E2="Pass",F2="A")
5. =OR(B2<50,E2="Fail")
6. =AND(C2>=60,D2>=85)
7. =AND(B2>50,C2>50)
8. =OR(B2>75,C2>75)
9. =AND(D2>80,E2="Pass")
10. =OR(F2="A",F2="B")

**Q11–Q20: IF + AND/OR Answers**

1. =IF(AND(B2>50,D2>80),"Eligible","Not Eligible")
2. =IF(OR(C2>60,F2="A"),"Good","Improve")
3. =IF(OR(D2<70,E2="Fail"),"Not Promoted","Promoted")
4. =IF(AND(B2>60,C2>60),"High Score","Low Score")
5. =IF(AND(F2<>"A",B2<60),"Average","Topper")
6. =IF(AND(D2>=80,D2<=100,E2="Pass"),"Final Eligible","Recheck")
7. =IF(OR(B2<40,C2<40),"Fail","Pass")
8. =IF(AND(B2>40,F2="B"),"Moderate","Check Again")
9. =IF(AND(B2>70,C2>70,D2>90),"Excellent","Good")
10. =IF(AND(E2="Pass",OR(F2="A",D2>85)),"Award","No Award")