**Defect Detection Percentage**

Definition : The defect detection percentage (DDP) gives a measure of the testing effectiveness. It is calculated as a ratio of defects found prior to release and after release by customers.

Calculation  
To be able to calculate that metric, it is important that in your defect tracking system you track:  
**affected version, version of software in which this defect was found.  
release date, date when version was released**You can also calculate DDP from sub-metrics:  
**Number of escaped defects  
Number of defects** (at the moment of software version release)

**DDP = Number of defects at the moment of software version release / Number of defects at the moment of software release + escaped defects found.**

As DDP ratio is changing over time as more defects are found by customers working with the version best visualization is using a line chart that starts with 100% at moment of software version release and a line representing a trend of how fast DDP is declining.

Example  
For example, suppose that 90 defects were found during QA/testing stage and 20 defects were found by customers after the release. The DDP would be calculated as 90 divided by (90 + 20) = 81.8%

<https://swtestingconcepts.wordpress.com/test-metrics/defect-detection-percentage/>

**Defect Removal Efficiency**

Definition : The defect removal efficiency (DRE) gives a measure of the development team ability to remove defects prior to release. It is calculated as a ratio of defects resolved to total number of defects found. It is typically measured prior and at the moment of release.

Calculation  
To be able to calculate that metric, it is important that in your defect tracking system you track:  
affected version, version of software in which this defect was found.  
release date, date when version was released  
**DRE = Number of defects resolved by the development team / total number of defects at the moment of measurement**.

DRE is typically measured at the moment of version release, the best visualization is just to show current value of DRE as a number.

Example  
For example, suppose that 100 defects were found during QA/testing stage and 84 defects were resolved by the development team at the moment of measurement. The DRE would be calculated as 84 divided by 100 = 84%

<https://swtestingconcepts.wordpress.com/test-metrics/defect-removal-efficiency/>

Defect-removal efficiency-the percentage of bugs eliminated by software reviews, inspections and tests-is a powerful software quality metric that should be understood by everyone in the software business. Many top companies have used this metric since the 1960s. In fact, one of the most common attributes of "best in class" companies is that their software managers, programmers and quality assurance staff know their defect-removal efficiency levels. This rather simple metric can lead to some very sophisticated analyses and change "quality" from an ambiguous, amorphous term to a tangible factor.

### *Inspection catches 70% of defects*

**Research Finding:**  
*The combination of design and code inspections usually removes at least 70% of the defects in a product.*

[The combination of design and code inspections usually removes at least 70% of the defects in a product](http://www.ifsq.org/finding-put-2.html)

### *Inspection catches 60% more errors than testing*

**Research Finding:**  
*Code inspection at NASA's Software Engineering Laboratory found 20 to 60 percent more errors than testing did.*

### *Code inspection is four times more effective than testing*

**Research Finding:**  
*Microsoft's applications division has found that it takes 3 hours to find and fix a defect using code inspection compared to 12 hours by using testing.*

### *Design defects take 6 times longer to find using testing*

**Research Finding:**  
*Detection of design defects costs 6 times more using testing than by using inspections.*

### Inspect during development

Software maintenance starts from day one of a project and inspected software is less expensive to alter, fix and maintain.

Research has yielded these findings:

* [The average project experiences about a 25 percent change in requirements during development](http://www.ifsq.org/finding-idd-5.html).
* [70 to 85 percent of rework on a typical project is caused by changes in requirements during development](http://www.ifsq.org/finding-idd-6.html).
* [Raytheon reduced its cost of rework from about 40% of total project cost to 20% through an initiative that focused on inspections](http://www.ifsq.org/finding-idd-7.html).

**Test Case Efficiency**

Test Case Efficiency = (Number of defects detected / Number of test cases run)\* 100

Objective: -To know the efficiency of the test cases that are being executed in the testing phase. The quality of the test cases can be determined.

 [Basic Testing Concepts](https://swtestingconcepts.wordpress.com/basic-testing-concepts/)

* [Bug](https://swtestingconcepts.wordpress.com/basic-testing-concepts/bug/)
* [Quality Assurance (QA)](https://swtestingconcepts.wordpress.com/basic-testing-concepts/quality-assurance-qa/)
* [Quality Control](https://swtestingconcepts.wordpress.com/basic-testing-concepts/3-quality-control/)
* [Reviews](https://swtestingconcepts.wordpress.com/basic-testing-concepts/reviews/)
* [Software Quality](https://swtestingconcepts.wordpress.com/basic-testing-concepts/software-quality/)

 [Test Artifacts](https://swtestingconcepts.wordpress.com/test-artifacts/)

* [Test case](https://swtestingconcepts.wordpress.com/test-artifacts/test-case/)
* [Test data](https://swtestingconcepts.wordpress.com/test-artifacts/test-data/)
* [Test harness](https://swtestingconcepts.wordpress.com/test-artifacts/test-harness/) [https://en.wikipedia.org/wiki/Test\_harness]
* [Test Plan](https://swtestingconcepts.wordpress.com/test-artifacts/test-plan/)
* [Test script](https://swtestingconcepts.wordpress.com/test-artifacts/test-script/)
* [Test suite](https://swtestingconcepts.wordpress.com/test-artifacts/test-suite/)
* [Traceability matrix](https://swtestingconcepts.wordpress.com/test-artifacts/traceability-matrix/)

 [Test Methods](https://swtestingconcepts.wordpress.com/test-methods/)

* [Automated Testing](https://swtestingconcepts.wordpress.com/test-methods/automated-testing/)
* [Black Box Testing](https://swtestingconcepts.wordpress.com/test-methods/black-box-testing/)
* [Manual Testing](https://swtestingconcepts.wordpress.com/test-methods/manual-testing/)
* [White Box Testing](https://swtestingconcepts.wordpress.com/test-methods/white-box-testing/)

 [Test Metrics](https://swtestingconcepts.wordpress.com/test-metrics/)

* [Defect Detection Percentage](https://swtestingconcepts.wordpress.com/test-metrics/defect-detection-percentage/)
* [Defect Removal Efficiency](https://swtestingconcepts.wordpress.com/test-metrics/defect-removal-efficiency/)
* [Test Case Efficiency](https://swtestingconcepts.wordpress.com/test-metrics/test-case-efficiency/)

 [Test Types](https://swtestingconcepts.wordpress.com/test-types/)

* [Exploratory Test](https://swtestingconcepts.wordpress.com/test-types/exploratory-test/)
* [Functional Test](https://swtestingconcepts.wordpress.com/test-types/functional-test/)
* [Performance Test](https://swtestingconcepts.wordpress.com/test-types/performance-test/)
* [Regression Test](https://swtestingconcepts.wordpress.com/test-types/regression-test/)
* [Sanity Test](https://swtestingconcepts.wordpress.com/test-types/sanity-test/)

<https://swtestingconcepts.wordpress.com/basic-testing-concepts/>

<https://en.wikipedia.org/wiki/Test_harness>

# Test harness From Wikipedia, the free encyclopedia

In [software testing](https://en.wikipedia.org/wiki/Software_testing), a **test harness** or **automated test framework** is a collection of [software](https://en.wikipedia.org/wiki/Software) and test data configured to test a program unit by running it under varying conditions and monitoring its behavior and outputs. It has two main parts: the [test execution engine](https://en.wikipedia.org/wiki/Test_execution_engine) and the [test script](https://en.wikipedia.org/wiki/Test_script) [repository](https://en.wikipedia.org/wiki/Software_repository).

Test harnesses allow for the [automation of tests](https://en.wikipedia.org/wiki/Test_automation). They can call functions with supplied parameters and print out and compare the results to the desired value. The test harness is a [hook](https://en.wikipedia.org/wiki/Hooking) to the developed code, which can be tested using an [automation framework](https://en.wikipedia.org/wiki/Test_Automation_Framework). A test harness should allow specific tests to run (this helps in optimizing), orchestrate a runtime environment, and provide a capability to analyse results.

The typical objectives of a test harness are to:

* Automate the testing process.
* Execute test suites of test cases.
* Generate associated test reports.

These individual objectives may be fulfilled by unit test framework tools, stubs or drivers.[[1]](https://en.wikipedia.org/wiki/Test_harness#cite_note-1)

A test harness **may** provide some of the following benefits:

* Increased productivity due to automation of the testing process.
* Increased probability that [regression testing](https://en.wikipedia.org/wiki/Regression_testing) will occur.
* Increased quality of software components and application.
* Repeatability of subsequent test runs.
* Offline testing (e.g. at times that the office is not staffed, like overnight).
* Access to conditions and/or use cases that are otherwise difficult to simulate (load, for example).

## Alternative definition

An alternative definition of a test harness is software constructed to facilitate [integration testing](https://en.wikipedia.org/wiki/Integration_testing). Where [test stubs](https://en.wikipedia.org/wiki/Test_stubs) are typically components of the application under development and are replaced by working components as the application is developed ([top-down integration testing](https://en.wikipedia.org/w/index.php?title=Top-down_integration_testing&action=edit&redlink=1)), test harnesses are external to the application being tested and simulate services or functionality not available in a test environment.

For example, when attempting to build an application that needs to interface with an application on a mainframe computer, but no mainframe is available during development, a test harness may be built to use as a substitute.

A test harness may be part of a project deliverable. It is kept separate from the application source code and may be reused on multiple projects. A test harness simulates application functionality; it has no knowledge of test suites, test cases or test reports. Those things are provided by a testing framework and associated automated testing tools. A part of its job is to set up suitable [test fixtures](https://en.wikipedia.org/wiki/Test_fixture). The test harness will generally be specific to a development environment such as [Java](https://en.wikipedia.org/wiki/Java_(programming_language)). However, [interoperability](https://en.wikipedia.org/wiki/Interoperability) test harnesses have been developed for use in more complex systems.[[2]](https://en.wikipedia.org/wiki/Test_harness#cite_note-2)

## References

 [ISTQB Exam Certification - "What is Test harness/ Unit test framework tools in software testing?"](http://istqbexamcertification.com/what-is-test-harness-unit-test-framework-tools-in-software-testing/), accessed 19 October 2015

 Ricardo Jardim-Gonçalves, Jörg Müller, Kai Mertins, Martin Zelm, editors, [*Enterprise Interoperability II: New Challenges and Approaches*](https://books.google.com/books?id=JZRDvNC78ZcC&pg=PA650&lpg=PA650&dq=interoperability+test+harness&source=bl&ots=o48FDE0adT&sig=xb4tLcq0tWdOBq9vU6FPJsNeaSE&hl=en&sa=X&ved=0CEAQ6AEwBWoVChMI7u-z6ILOyAIVAmkUCh2s5A7n#v=onepage&q=%5B3%5D&f=false), Springer, 2007, p. 674, accessed 19 October 2015

## Further reading

* Pekka Abrahamsson, Michele Marchesi, Frank Maurer, *Agile Processes in Software Engineering and Extreme Programming*, Springer, 1 January 2009

<https://www.guru99.com/sap-abap-interview-questions.html>

# Top 35 SAP ABAP Interview Questions & Answers

**1) What is SAP ABAP?**

SAP is a type of software known as ERP (Enterprise Resource Planning) that large company use to manage their day to day affairs. ABAP (Advanced Business Application Programming) is the coding language for SAP to develop RICEFW objects. (Reports, Interfaces, Extensions, Forms and Workflows).

**2) What do you mean by an ABAP data dictionary?**

To describe the logical structures of the objects that are used in application development ABAP 4 data dictionary is used. It is also used to show the underlying relational database in tables.

**3) Explain the difference between pool tables and transparent tables?**

Transparent tables: It has one to one relation with the table in the database. Its structure corresponds to single database field.

Pooled tables: It has many to one relation with the table in the database. Pooled tables are stored at the database level.

a) Basic List: For simple reports

b) Statistics: For Percentage, Average etc.

c) Ranked List : For analytical reports

**4) What do you mean by BDC (Batch Data Communications) programming?**

It is an automatic procedure to transfer large or external data into SAP system. 'Queue file' is the central component of the transfer, which receives the data through batch input programs and groups that are associated into 'sessions'.

**5) Describe the data classes?**

The data classes are classified into following classes

**Master Data**: The data in this class seldom change

**Transaction Data**: The data can be changed often in this class

**Organization Data**: This data is a customized data and is entered in the system when the system is configured. It is rarely changed.

**System Data:** This data is used by R/3 system itself

**6) What are the internal tables?**

Internal table exists only when the program is run. It is used for performing table calculations on subset of database tables and also for re-organizing the content of database tables as per the users need.

**7) List down the functional modules used in sequence in BDC?**

There are 3 functional modules which are used in sequence to perform data transfer successfully using BDC programming. They are

a) BDC\_OPEN\_GROUP

b) BDC\_INSERT

c) BDC\_CLOSE\_GROUP

**8) What is a foreign key relationship?**

To ensure the consistency of data, foreign keys are used. The relationship established between the tables and must be explicitly defined at field level. Data entered should be checked against the existing data to ensure that there is no contradiction. Cardinality has to be specified while defining foreign key relationship.

**9) In ABAP what are the differences between table and structure in data dictionary?**

The difference between structure and table is

a) Data can be stored physically in Table, but a structure cannot

b) Structure does not have primary key but table can have

c) Table can have the technical attribute but the structure does not have

**10) What is Smart Forms?**

Smart forms allow you to create forms using a graphical design tool.

**11) What are the components of SAP scripts?**

For SAP, SAP scripts are a word processing tool. It has a function like standard text and layout sets. Its layout set consists of: Windows and pages, Character formats, Paragraph formats etc**.**

**12) How to create 'table cluster'?**

a) In ABAP dictionary, select object type Table, enter a table name and choose create

b) A field maintenance screen for the table is displayed. Table type Transparent table, set it as a default

c) Make the necessary entries in the short description and delivery classified on the Attributes page. Then define the fields of the table.

d) Proceed as when creating a transparent table. Now save your entries

e) Now choose EXTRASàChange table category

f) When a dialogue box appears you have to select the table type 'Pooled table' or 'Cluster table'

g) After selecting the table, return to the field maintenance screen for the table. Field pool or cluster name is displayed on the Attributes tab page in addition to the standard fields.

h) Now enter the name of the table cluster or table pool to which you want to assign the cluster table.

**13) How can you format the data before write statement in the report?**

By using the loop event the reports output can be formatted

a) .at first

b) .at new

c) .at last

**14) Explain the difference between Template and Table?**

The difference between the table and template is that, table is a dynamic and template is a static.

**15) Mention what is ALV programming in ABAP? When is this grid used in ABAP?**

ALV stands for Application List Viewer. To enhance the output of the report, SAP provides a set of ALV function modules which can be used, and it also improves the functionality and readability of any report output. It is an efficient tool used for arranging the columns in a report output.

**16) When do we use End-of-selection?**

End of the selection event is mostly used when we are writing HR-ABAP code. In the HR-ABAP code, data is retrieved in the start of selection event and printing on the list and all will be done at the end of the selection event.

**17) Mention the difference between ABAP and OOABAP? In what situation do you use OOABAP?**

ABAP is used to develop traditional programs in R/3, while OOABAP is used to develop BSP/ PCUI applications and also anything that an involved object oriented like BADI's and SmartForms etc.

**18) What is table buffer? Which type of tables used this buffer?**

Over here, buffer means memory area, table buffer means the table information is available on the application server. When you call data from database table, it will come from application server. Transparent tables and pool tables are buffered, while cluster table cannot be buffered.

**19) What is the use of 'pretty printer'?**

To format the ABAP code 'pretty printer' is used.

**20) What is the difference between 'Type' and 'Like'?**

'Type': You assign data type directly to the data object while declaring.

'Like': You assign the data type of another object to the declaring data object.

'Type' refers the existing data type while 'Like' refers to the existing data object.

**21) What are the different ABAP/4 editors? What are the differences?**

The 2 editors are SE38 and SE80 and both have the ABAP editor in place. In SE38 , you can create programs and view online reports and basically do all the development of objects in this editor. In SE80, there are additional features such as creating packages, function group, module pool, classes, programs and BSP applications.

**22) Explain the difference between dialog program and a report?**

A report is an executable program; dialog is a module pool program. It has to be executed via a transaction only. Dialog programming is used for customizations of screens.

**23) What is lock object?**

To synchronize access of several users using same data Lock objects are used.

**24) How data is stored in cluster table?**

A cluster table contains data from multiple DDIC tables. It stores data as name value pair.

**25) How can you debug a script form?**

To debug a script form, you have to follow

SE71-->give the form name->utilities->activate debugger

**26) What are different types of data dictionary objects?**

The different types of data dictionary objects are:

a) Tables

b) Views

c) Domain

d) Data Element

e) Type Groups

f) Search Helps/Matchcode Objects

g) Lock Objects

h) Structures

i) Table Types

**27) What are the ways you can do the tuning? What are the major steps will you use for these?**

Tunning can be done in three ways disk i/o, [SQL](https://www.guru99.com/sql.html) tunning and memory tunning. Before tunning, you have to get the status of your database using oracle utility called statpack and tkprof .

**28) In the 'select' statement what is 'group by'?**

To fetch the data from the table by the specified field Group by Clause is used.

**29) What is dispatcher?**

A control agent referred as SAP dispatcher, manages resources for the R/3 applications.

**30) Mention what are the two methods of modifying SAP standard tables?**

There are two methods for modifying SAP standard tables

a) Append structures

b) Customizing includes

**31) What is the difference between a 'Database index' and a 'Match code'?**

'Database Index' contains fields from one table while 'Match Code' contain fields from several tables. Match code objects can be built on cluster tables, transparent tables and pooled tables.

**32) Explain the benefits of modularization technique?**

By using modularization techniques, you can avoid redundancy if the program contains the same or similar blocks of statements or it is required to process the same function several times. By modularizing the ABAP/4 programs, we make them easy to read and improve their structure. Modularized programs are also easier to maintain and update.

**33) How can you create callable modules of program code within one ABAP/4 program?**

a) By defining Macros

b) By creating include programs in the library.

**34) What are different types of parameters? How can you distinguish between different kinds of parameters?**

The different types of parameters are

a) Formal Parameters: It is defined during the definition of subroutine with the 'FORM' statement

b) Actual Parameters: It is specified during the call of a subroutine with the 'PERFORM' statement

You can distinguish different kind of parameters by their functionality. Input parameters are used to pass data to subroutines, while output parameters are used to pass data from subroutines.

**35) What are the different databases Integrities?**

a) Semantic Integrity

b) Relational Integrity

c) Primary Key Integrity

d) Value Set Integrity

e) Foreign Key Integrity

f) Operational Integrity

Also, it has 50 Qs Mock Exam/Test on SAP ABAP