SAP R/3 Technical Consultant Certification Program

SAP Australia & New Zealand

Release 3.0

SAP® AG **Neurottstr. 16** **D-69190 Walldorf**
5001 2228

1 Copyright

Ordering Information

To order additional copies of this manual, use product number 5001 2228.

Contents

2 Program Overview

2.1 The Concept of Knowledge Dissemination

Since Release 3.0 of the R/3 System, SAP has offered a certification program for consultants in the areas of R/3 administration, system management, and database administration.

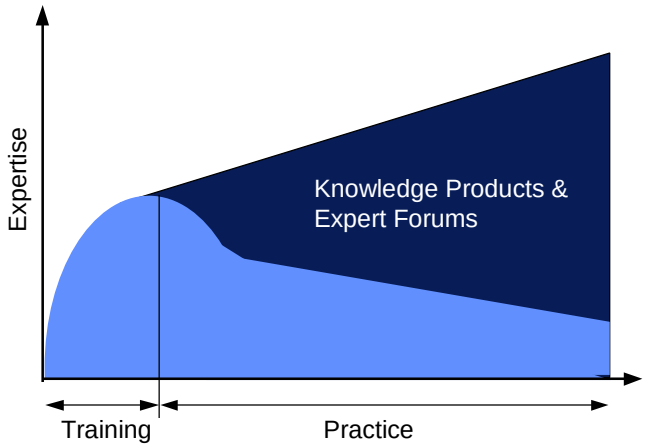
The aims of the program are to:

- improve the quality and efficiency of training courses
- reduce training times
- increase the transparency of the certification procedure
- simplify the consultant certification procedure

To reach these goals, we must forge new paths for knowledge dissemination and reinforcement. Our primary consideration is to reverse the typical negative trend in the learning curve that occurs once training is complete and to guarantee that this trend remains positive.

This concept includes the following elements for knowledge dissemination:

- *Training*
- *Knowledge Products*
- *Expert Forums*



In particular, the *Knowledge Products* and *Expert Forums* components ensure that learning does not end with the training course, rather, that is intensified.

2.2 Training

While individual aspects of the R/3 Basis system were emphasized in the past, the new training concept concentrates on providing knowledge about all aspects of the R/3 Basis implementation. When the Expert Workshops, and the respective certification tests, are successfully completed, candidates are awarded the "R/3 Technical Consultant Certification".

The training program is divided into the following levels:

Planning Competence

This level provides an opportunity to find out about planning and carrying out the technical aspects of an R/3 implementation.

Core Competence

The necessary knowledge for operating a computer center is provided in the Technical Core Competence training courses.

Expert Competence

Specific subjects are discussed in detail in the Expert Workshops "from professionals for professionals".

2.3 Knowledge Products

At the conclusion of every training course, each participant receives the appropriate "Knowledge Product" CD. The Knowledge Products are multimedia encyclopedias that cover the following areas:

2.3.1 Training

This area contains the training material, questions, and exercises used during the corresponding training course. This provides the participant with a way to review the materials after completion of the course, thus reinforcing the lessons.

2.3.2 Reference Section

The reference section contains the documents that SAP has available on a specific subject area. This provides the participant with access to information that goes beyond the scope of the training course and contains references to related subjects. This is supported through a clear hierarchy structure, helpful search functions, and practical indexing.

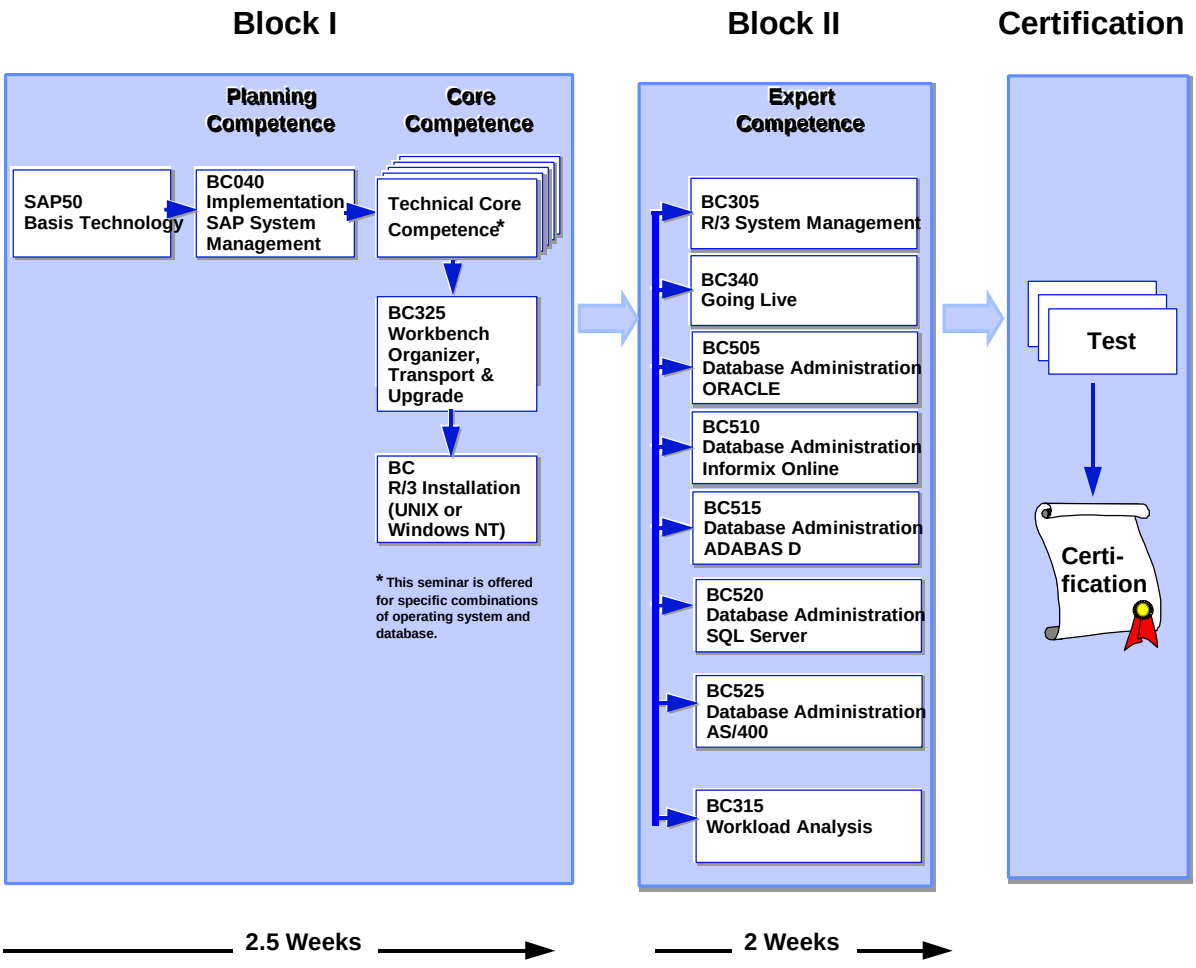
2.3.3 Technical Implementation Project

The example of a "technical implementation project" is used to describe the issues that must be considered during the implementation of an R/3 System. The appropriate concepts, options, and strategies relevant to mastering the corresponding tasks are introduced from a consulting standpoint. This is followed by a sample project schedule, representing a realistic implementation outline of the tasks. Finally, the user has the option to document and comment on the results.

2.4 Expert Forums

The discussion forums open new possibilities for conversing with experts via the WWW or OSS. Questions and topics may be discussed helping to convert theoretical knowledge into practical experience. In addition, suggestions and recommendations for optimizing the training courses and/or the Knowledge Products may be submitted back to SAP through these means.

2.5 Training Program



The training program recommended as preparation for certification is divided into two blocks. These training blocks are involved with teaching basic and advanced technical knowledge and discussing conceptual issues involved in the implementation and operation of an R/3 System.

Due to the advanced technical concepts covered in the second training block (Block 2), it is highly recommended that certification candidates first utilize and reinforce the skills learned in the first training block (Block 1) through practical R/3 project work.

2.5.1 Block 1

The first block begins with course SAP50, providing a general understanding of the R/3 System architecture. The BC040 seminar is intended for consultants and managers of technical R/3 implementation projects. The aim of this seminar is to provide fundamental knowledge about the R/3 Basis system and R/3-specific aspects for planning and implementing an R/3 computer center.

The necessary information on R/3 administration, operating system management, and database administration is provided in a Technical Core Competence workshop and is reinforced through practical exercises. The R/3 Installation course is only offered within the curriculum of the certification program, and is operating system-specific (UNIX or MS Windows NT).

Upon completion of the first training block, participants have been trained in installing an R/3 System, setting up basic system configurations, performing administration tasks, and evaluating and realizing strategies for system implementation.

2.5.2 Block 2

The aim of the second training block is to provide participants with the advanced knowledge they will require for a career as a consultant, ”from professionals for professionals”. The training courses have a workshop format and focus on specific topical areas.

2.6 Certification

The certification is based upon the R/3 Basis System components and is called:

"SAP Certified R/3 Technical Consultant"

It is valid for the specific combination of R/3 release, database, and operating system for which the certification was awarded.

Certification is solely based upon whether, or not, candidates pass the relevant certification tests as described in this document.

2.6.1 Scope of the Certification

The certification strives to confirm competence in the **R/3-specific aspects** of the implementation and operation of an R/3 computer center. It does **not** guarantee mastery of the necessary operating system and database-related skills also required of a certified consultant. Certification candidates should obtain these skills **before** attending the certification tests through formal training and through experience.

2.6.2 Admittance to the Certification Program

There are no restrictions on certification program participation. We assume that certification candidates have prepared themselves for testing by attending the recommended training courses from SAP and from our partners in the operating system, database and networking areas.

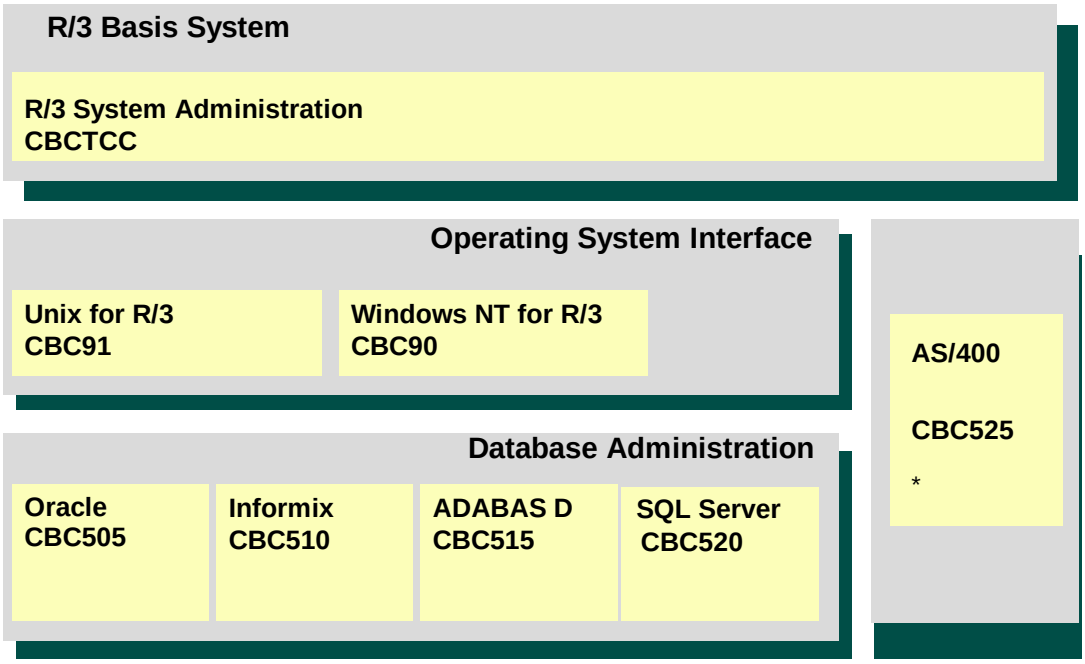
The ability to understand written English is necessary to participate in the certification program because the tests are only available in English.

2.7 Certification Procedures

2.7.1 Initial Certification

Certification tests are performed as part of the certification process. These certification tests have a modular structure that is arranged according to the following core subjects:

- R/3 Basis System
- Operating System Interface
- Database Administration



* Incl. DB2/400

The certification test module for "R/3 System Administration" is independent from the operating system and database test modules. The Operating System Interface and Database Administration areas are covered in specific certification tests for the respective database and operating system.

Combining the above certification tests results in the following possible certifications which are operating system and database-specific:

R/3 Certified Technical Consultant			
	Test Modules		
For	R/3 Basis System	Operating System	Database Administration
• R/3 UNIX Oracle	CBCTCC	CBC91	CBC505
• R/3 UNIX Informix	CBCTCC	CBC91	CBC510
• R/3 UNIX Adabas D	CBCTCC	CBC91	CBC515
• R/3 NT Oracle	CBCTCC	CBC90	CBC505
• R/3 NT Informix	CBCTCC	CBC90	CBC510
• R/3 NT Adabas D	CBCTCC	CBC90	CBC515
• R/3 NT SQL Server	CBCTCC	CBC90	CBC520
• R/3 AS/400	CBCTCC	CBC525	

A candidate who has passed all of the certification tests for one of the combinations listed above is awarded the corresponding certification. No partial certification is awarded for passing individual certification tests.

2.7.2 Execution and Contents of the Certification Tests

The certification tests are held in multiple-choice form, and exclusively, in English.
Candidates are permitted to refer to the corresponding "R/3 Online Documentation" during the tests.
The contents and emphasis of each certification test have been standardized and are explained in the Test Specification section of this document.
To enroll in a particular certification test, contact either the SAP Partner Academy or your local SAP Subsidiary.

2.7.3 Duration of the Initial Certification

The approximate duration of the individual tests has been defined as follows:

- R/3 Basis System Approx. 2 hours
- Operating System Interface Approx. 1 hour *
- Database Administration Approx. 1 hour *

Total duration **Approx. 4 hours**

***** Note: The AS/400 test module is 2 hours long because it contains both the operating system and database components.

2.7.4 Supplementing the Certification

If a candidate already has one certification, that certification can be supplemented by passing the corresponding certification tests for other databases and/or operating systems. The modular structure of the certification test enables several combinations.

Three different cases are differentiated:

- **Supplementing the certification with another database under the same operating system**
  In this case, the candidate must pass the certification test for the corresponding database (CBC505, 510, 515,). As preparation, we recommend attending the respective database workshop (BC500 series; see course description in the Test Specification section of this document).
- **Supplementing the certification with another operating system under the same database**
  In this case, the candidate must pass the certification test for the corresponding operating system (CBC90, 91). As preparation, we recommend attending the respective installation workshop (PABC90, 91; see course description in the Test Specification section of this document).
- **Supplementing the certification with another operating system and database**
  In this case, the candidate must pass the certification tests for the corresponding operating system (CBC90, 91, CBC525) and database (CBC500 series). As preparation, we recommend attending the appropriate workshops (see above and the Test Specification section of this document).

2.8 Changing Existing Certifications

Since August 1996, SAP has offered the ”SAP Certified R/3 Technical Consultant” certification. The ”SAP R/3 Certified Installer” certification is no longer valid.
Previous Certified Installer certifications for Release 3.0 have been updated to ”SAP Certified R/3 Technical Consultant” certifications. This is limited to the databases and platforms for which the prior installer certification was awarded.
”SAP Certified R/3 Technical Consultant” certifications awarded in this manner can also be supplemented with additional databases and/or operating system platforms by passing the corresponding certification tests.

3 Course Descriptions

3.1 BC040 - Implementation Planning for R/3 System Management

Target Group
- Project Managers
- IT Managers

Aims
Participants are informed about the main aspects of a technical implementation of the R/3 System. They will also go through a complete list of the tasks and roles involved in supporting a live R/3 System. Concepts and staffing of the implementation will be explained using case studies.

Prerequisites
SAP050 Basis Technology

Course Contents
- System environment
    - Test, consolidation, and production system environment
- Software logistics
    - Transport system
    - System upgrades
- R/3 System administration
    - System configuration
    - User administration / system authorizations
    - R/3 background processing
    - Spool management
    - Archiving
- Database administration
    - Database backup
    - Database monitoring
- Data interfaces
- Training concepts for employees in the Basis implementation area
- Desktop management
    - HelpDesk integration
    - Software distribution
    - PC network

Note
This seminar is oriented towards IT management staff who are responsible for the R/3 implementation. We recommend it in preparation for the technical kickoff meeting.

3.2 BC310, BC312, BC314 - TCC NT, BC360, BC361, BC362 - TCC UNIX BC370 - TCC AS/400

TTC = Technical Core Competence

Target Group

- Project team
- SAP administrators
- System administrators
- Database administrators

Aims

This course provides specific recommendations on handling the individual tasks of R/3 administration. All administrative tasks will be introduced and practiced based on practical examples.

Prerequisites

- SAP050 Basis Technology
- Advanced knowledge of the corresponding operating system and database system.

Course Contents

- Software logistics
  - System and client concept
  - System configuration in the Correction and Transport System
- System administration
  - System configuration
  - User administration / system authorizations
  - Archiving
- R/3 background processing
- Spool management
- Database administration
  - Database backup
  - Database monitoring
- Data interfaces
- Error analysis
- Analyzing system load

Note

Course	Name	Operating system	Database
BC310	Technical Core Competence	MS Windows NT	ORACLE
BC312	Technical Core Competence	MS Windows NT	ADABAS D
BC314	Technical Core Competence	MS Windows NT	SQL Server
BC360	Technical Core Competence	UNIX	ORACLE
BC361	Technical Core Competence	UNIX	INFORMIX
BC362	Technical Core Competence	UNIX	ADABAS D
BC370	Technical Core Competence	AS/400	(incl. DB2 / 400)

3.3 BC305 - Advanced R/3 System Management

Target Group

- Project team
- SAP administrators
- System administrators

Aims

This course reinforces the knowledge required to master the specific tasks of an R/3 System administrator.

Prerequisites

- SAP050 Basis Technology
- Technical Core Competence (BC310, BC312, BC314, BC360, BC361, BC362, BC370)
- Advanced knowledge of the corresponding operating system and database system.

Course Contents

- SAP user administration (from a technical perspective
- CCMS configuration
  - R/3 profile maintenance
  - Definition of the R/3 operation mode
  - Definition of logon groups
- CCMS monitoring in overview
- Background scheduling system
  - Controlling background jobs
  - Monitoring background jobs
- Spool and printer management
- Error analysis in the R/3 System
  - System log

Note

We recommend attending this course six months after the initial training block.

3.4 BC315 - Workload Analysis

Target Group

- Project team
- SAP administrators
- System administrators
- Database administrators

Aims

This course provides an introduction to R/3 performance monitoring and fine-tuning. Understanding of these advanced topics is enhanced through the use of practical examples.

Prerequisites

- SAP050 Basis Technology
- Technical Core Competence (BC310, BC312, BC314, BC360, BC361, BC362, BC370)
- Advanced knowledge of the corresponding operating system and database system.

Course Contents

- Analysis tools for performance monitoring
  - Using the tools
  - Configuration
- Demonstration of performance analysis based on practical examples

Note

We recommend attending this course six months after the initial installation.

3.5 BC325 - Workbench Organizer & Transport System, System Upgrade

Target Group

- Project team
- SAP administrators
- System administrators
- Database administrators

Aims

This course deals with the software logistics of the R/3 System. Case studies are used to explain an R/3 administrator's essential tasks when importing new software objects.

Prerequisites

- SAP050 Basis Technology
- Technical Core Competence (BC310, BC312, BC314, BC360, BC361, BC362, BC370)
- Advanced knowledge of the corresponding operating system and database system.

Course Contents

- Configuring an R/3 System environment
  - Systems and clients
  - Configuring the Workbench Organizer and the Transport System
- Working with the Workbench Organizer and the Transport System
- R/3 System upgrade

Note

We recommend attending this course two months after the initial installation.

3.6 BC340 - Going Live

Target Group

- Project team
- SAP administrators
- System administrators
- Database administrators

Aims

Specific tasks like data migration, setting up the production system, and performing a stress test are introduced in this course. Participants receive practical descriptions of procedures for the efficient execution of tasks involved in computer center operation that must be mastered during the going live phase.

Prerequisites

- SAP050 Basis Technology
- Technical Core Competence (BC310, BC312, BC314, BC360, BC361, BC362, BC370)
- Advanced knowledge of the corresponding operating system and database system.

Course Contents

- Setting up the production R/3 System
  - Copying the customizing client to the production client
  - Cleaning up the production client
  - Integration of the production system within the software logistics framework
- Performing a stress test
  - Definition of a load profile
  - Organizational preparations - execution and analysis
- Sizing check
  - Workload profile
  - Memory sizing check
  - CPU sizing check
- Installation and configuration check

Note

We recommend attending this course four to six months before going live.

3.7 BC505 - Database Administration ORACLE

Target Group

- Project team
- System administrators
- Database administrators

Aims

This course provides participants with an introduction to the tools for R/3 database administration. Participants are presented with recommendations for data backup and database monitoring.

Prerequisites

- SAP050 Basis Technology
- Technical Core Competence (BC310, BC312, BC314, BC360, BC361, BC362, BC370)
- Advanced knowledge of the corresponding operating system and database system.

Course Contents

- Data backup
  - Backup concepts
  - Carrying out a data backup
- Database restore and recovery
- Database monitoring
  - Using the SAPDBA tool
  - Working with CCMS-DBA

Note

We recommend attending this course two months after the initial installation.

3.8 BC510 - Database Administration INFORMIX ONLINE

Target Group

- Project team
- System administrators
- Database administrators

Aims

This course provides participants with an introduction to the tools for R/3 database administration. Participants are presented with recommendations for data backup and database monitoring.

Prerequisites

- SAP050 Basis Technology
- Technical Core Competence (BC310, BC312, BC314, BC360, BC361, BC362, BC370)
- Advanced knowledge of the corresponding operating system and database system.

Course Contents

- Data backup
  - Backup concepts
  - Carrying out a data backup
- Database restore and recovery
- Database monitoring
  - Using the SAPDBA tool
  - Working with CCMS-DBA

Note

We recommend attending this course two months after the initial installation.

3.9 BC515 - Database Administration ADABAS D

Target Group

- Project team
- System administrators
- Database administrators

Aims

This course provides participants with an introduction to the tools for R/3 database administration. Participants are presented with recommendations for data backup and database monitoring.

Prerequisites

- SAP050 Basis Technology
- Technical Core Competence (BC310, BC312, BC314, BC360, BC361, BC362, BC370)
- Advanced knowledge of the corresponding operating system and database system.

Course Contents

- Data backup
  - Backup concepts
  - Carrying out a data backup
- Database restore and recovery
- Database monitoring
  - Using the SAPDBA tool
  - Working with CCMS-DBA

Note

We recommend attending this course two months after the initial installation.

3.10 BC520 - Database Administration MS SQL SERVER

Target Group

- Project team
- System administrators
- Database administrators

Aims

This course provides participants with an introduction to the tools for R/3 database administration. Participants are presented with recommendations for data backup and database monitoring.

Prerequisites

- SAP050 Basis Technology
- Technical Core Competence (BC310, BC312, BC314, BC360, BC361, BC362, BC370)
- Advanced knowledge of the corresponding operating system and database system.

Course Contents

- Data backup
  - Backup concepts
  - Carrying out a data backup
- Database restore and recovery
- Database monitoring
  - Using the SAPDBA tool
  - Working with CCMS-DBA

Note

We recommend attending this course two months after the initial installation.

3.11 BC525 - Database Administration DB2/400

Target Group

- Project team
- System administrators
- Database administrators

Aims

This course provides participants with an introduction to the implementation and administration of an R/3 database on AS/400. Participants are presented with recommendations for data backup and database monitoring.

Prerequisites

- SAP050 Basis Technology
- Technical Core Competence (BC370)
- Advanced system administration skills in the corresponding operating system and database.

Course Contents

- Database architecture
- R/3 on DB/2 for OS/400
- Data backup
  - Backup concepts
  - Carrying out a data backup
- Database restore and recovery
- Database monitoring

Note

We recommend attending this course two months after the initial R/3 System installation.

3.12 PABC90 - R/3 Installation under MS Windows NT, PABC91 - R/3 Installation under UNIX

These courses are offered for the MS Windows NT (PABC90) and UNIX platforms (PABC91) and are database independent.

Target Group

- Consultants
- R/3 Installers
- System administrators

Aims

This course present students with an overview of the R/3 System installation and an in-depth discussion of critical implementation issues.

Prerequisites

- Operating system training and experience
- Database administration training and experience
- R/3 Technical Core Competence training

Course Contents

- Installation Planning and hardware requirements
- R/3 System installation
- Desktop Integration
- Language Transport
- Setup of Remote Connection to SAP
- Setup of additional R/3 Systems

4 Test Specifications

4.1 Overview

The SAP R/3 Technical Consultant Certification assesses the respective knowledge of a technical consultant in the areas of the R/3 Basis System, Operating System, and Database Administration for a supported R/3 System platform.
Standard certification tests target the set of skills that R/3 Technical Consultants should have and the tasks for which they should be qualified. The following Qualification Profile lists these skills and tasks:

4.2 Qualification Profile of a Certified SAP R/3 Technical Consultant:

- Advise customers on system, networking, and hardware planning in terms of R/3 security and performance for specific user and application environments
- Advise customers on R/3 System Landscape implementations in terms of development, quality assurance, and production environments
- Advise customers on R/3 client/server implementation scenarios
- Advise customers on SAP Remote Connection
- Install R/3 for specific operating system and database combinations
  - Plan the distribution of critical database, operating system, and R/3 Instance components on available devices
  - Implement SAP security and performance conventions
  - Install and configure the database and the components of an R/3 System
  - Plan and implement the R/3 Desktop components
  - Verify that an R/3 installation is complete and correct
- Upgrade R/3 Systems and perform upgrade related tasks
  - Perform R/3 System, database, and operating system modifications as required
  - Modify/activate ABAP/4 Dictionary objects
  - Perform R/3 object modifications using the transactions SPDD and SPAU
  - Apply Hot Packages
- Perform R/3 System Administration activities
  - Manage user administration
  - Manage spool administration
  - Schedule and monitor background processing
  - Maintain R/3 clients
  - Set up and maintain the R/3 Workbench Organizer/Transport system
  - Analyze the R/3 System log
  - Troubleshoot system problems
  - Perform R/3 Basis System customizations
- Use R/3 performance tools
  - Monitor system performance
  - Identify major performance bottlenecks
- Perform database administration tasks
  - Advise customers on database backup procedures and strategies

Advise customers on how to prevent problems with the database
Perform database storage management tasks
Perform database restore and recovery tasks
Plan and implement the copying of an existing R/3 System to another computer

- Use the SAP OSS System to register problems, to look up R/3 Notes, and to solve problems

4.3 Test: CBCTCC- R/3 Basis System

4.3.1 Overview

The R/3 Basis System test module covers the R/3 Basis System areas:

R/3 System Administration
R/3 System Workload Analysis
R/3 System Workbench Organizer, Transport, and Upgrade

Each certification candidate must successfully complete the CBCTCC-R/3 Basis System test and the corresponding operating system and database test modules.

The goal of the R/3 Basis System test is to establish whether a test candidate has a good understanding of the R/3 Basis System.

Certification candidates can prepare themselves for the R/3 Basis System test by attending the respective R/3 Technical Core Competence course, other R/3 Basis courses, and through supplementary practical experience.

The test duration is 2 hours and consists of approximately 80 multiple-choice and free-text questions taken from the following topics:

4.3.2 R/3 System Administration test topics

- **Starting and Stopping the R/3 System**
  - Be familiar with the operating system level programs and requirements for starting and stopping R/3
  - Use the startsap and stopsap programs to startup and shutdown Unix based R/3 Systems
  - Use the SAP Service Manager to startup and shutdown Windows NT based R/3 Systems
  - Be familiar with the startup and shutdown sequences for R/3 System components
  - Understand the function of the R/3 System profiles and maintain them using CCMS
  - Use CCMS to administer local and remote R/3 Instances
  - Use operating system level procedures to administer local and remote R/3 Instances
  - Be familiar with correct handling procedures in response to uncontrolled shutdown or hardware failure
- **Background Processing**
  - Run background jobs based on event triggering
  - Create Class-A background jobs using operation modes
  - Be familiar with external program functionality support and related security limitations
  - Schedule system maintenance jobs to remove old log entries
  - Schedule system performance collector jobs
  - Maintain background processing profile parameters
  - Be familiar with security authorizations
  - Use the job scheduling programming interface (background API) to design complex scheduling solutions and to control user access to background resources
- **Spooling and Printing**
  - Plan, set up, and manage LAN and WAN based R/3 System printing environments
  - Plan and implement practices and standards to meet critical printing and secure printing requirements
  - Plan and implement practices and standards in terms of high availability and mass printing requirements
  - Be familiar with practices and standards for customizing the printing environment for application specific requirements
  - Be familiar with the limitations and trade-offs involved in printing across a remote connection
  - Implement effective printer naming conventions
  - Use authorizations to control printer usage
  - Be familiar with SAP provided tools and techniques for printer administration
- **User Connections**

- Be familiar with the processes and options available to administrators for connecting to the R/3 System
- Administer R/3 user front-ends and implement logon load balancing
- Administer the distribution of application server resources
- Implement R/3 System high availability conventions and practices
- Implement security conventions and practices in terms of operating system and networking issues
- Be familiar with the use and implementation of SAProuter
- Integrate non-SAP hardware and networking practices in the R/3 environment

· **User Administration**
- Be familiar with the tasks and responsibilities of administrators for creating, managing, and controlling access to the R/3 System and its data
- Be familiar with the various R/3 user types and their functions
- Administer the R/3 System users, operating system users, and database users necessary for R/3 operations
- Manage and create new users, groups, and profiles using the respective R/3 transactions
- Implement 3-tiered authorization control within the R/3 System
- Use standard R/3 System transactions to trace user activity and transactions, to verify authorizations, and to display user authorizations
- Transport client specific user objects between R/3 Systems or between clients
- Use transaction SM04 to monitor and control active users

· **Alert Monitoring**
- Use the R/3 System Alert Monitors to recognize critical situations during R/3 System runtime and in operating system, database, and network environments
- Interpret the color scheme used with the Alert Monitors
- Recognize system performance bottlenecks and system disruptions as displayed by the Alert Monitors
- Maintain Alert Monitor threshold values and adjust them to meet customer-specific requirements

· **Troubleshooting**
- Be familiar with the 3 categories of problem situations in the R/3 System diagnostic road map -
  start/stop problems, runtime problems, and performance problems
- Verify the integrity of an R/3 System installation to determine whether all software, hardware, and configuration requirements have been met
- Determine the source of R/3 System runtime problems by analyzing the R/3 System logs, operating system logs, and database log files
- Be familiar with R/3 System process management concepts and conventions
- Use the CCMS to monitor the R/3 System interface to the operating system and database components

4.3.3 R/3 System Workload Analysis test topics

- **Performance Problems due to Expensive Selects**
  - Expensive selects
  - Tuning expensive selects
  - Finding expensive selects
  - SQL Trace
  - Explain SQL
- **Performance Problems due to ABAP/4 Program Buffering**
  - ABAP/4 Program Buffer
  - Performance consequences of having a small buffer
  - Monitoring the ABAP/4 buffers
  - Tuning procedures when using small ABAP/4 buffers
- **Table Buffering in R/3**
  - Buffered tables
  - Types of buffering
  - When tables may be buffered
- **Performance Bottlenecks due to Load from External Sources**
  - Effects of external programs on R/3 performance
  - Identifying external programs causing load
  - Typical external load
- **Memory Management in the R/3**
  - Memory management in release 2.2
  - ROLL/PAGE areas in R/3
  - ROLL/PAGE bottlenecks in R/3
  - Memory management in release 3.0
- **SAP Wait Time vs. Operating System Wait Time**
  - SAP wait time
  - Operating system wait time
  - Effects of OS and SAP wait time on R/3 performance
  - Identifying SAP and OS wait time problems in R/3
- **The ABAP/4 Trace Tool (ATRA)**
  - ATRA tool
  - ABAP/4 runtime analysis
  - Use of ATRA in analyzing performance-critical reports

4.3.4 R/3 System Workbench Organizer, Transport, and Upgrade test topics

- **R/3 System Landscape planning**
  - Be familiar with the development, quality assurance, and production system roles and their distribution to R/3 Clients in 1, 2, and 3 system landscapes
  - Understand the advantages of having a 3 system R/3 landscape and the limitations of 1 and 2 system landscapes
  - Plan the architecture of an R/3 System landscape based upon development requirements and hardware resources
- **Setup of the R/3 Development System**
  - Set up the transport system at the operating system level and be familiar with the transport system interface to the host operating system
  - Use transaction SE06 to set up the Workbench Organizer for 1, 2, or 3 system landscapes
  - Be familiar with the function of the R/3 Transport System control tables - TSYST, TASYS, DEVL
  - Be familiar with the purposes and procedures for setting R/3 System Change Options and client attributes
  - Be familiar with the function and use of the Client Copy tool to create new R/3 Clients from existing clients
- **R/3 Implementation Process**
  - Be familiar with the 5 types of R/3 System change levels: Customizing, Customer Developments, Enhancements, Modifications, Advance Corrections
  - Perform customizing tasks and automatically save the changes to a customizing change request
  - Create repository objects and save them to a change request
  - Release change requests for transport
  - Be familiar with version management and be able to locate previous versions of repository objects
  - View the contents of change requests
  - Be familiar with the Workbench Organizer (WBO), Customizing Organizer, and the Implementation Guide (IMG) and their functions in change request management
  - Differentiate between client-dependent and client-independent changes
  - Differentiate between transportable and local change requests
  - Be familiar with the function of the TDEVC table and how development classes are used to define an object's transport path and to group objects
  - Be familiar with the "original system" concept for repository objects
  - Be familiar with the function of the TWSYS table and be able to differentiate between corrections to original objects, repairs to copied objects, and modifications to SAP owned objects
  - Use SAP Software Change Registration (SSCR) to register developers and to modify SAP repository objects

- **Setup and Maintenance of an R/3 System within a System Landscape**
  - Be familiar with the use of change request management during the setup and maintenance of additional R/3 Systems within a system landscape
  - Be familiar with the client copy and client transport tools and how they are used to build an R/3 System landscape
  - View the contents of system transport buffers
  - Be familiar with the use of the ”tp” command and its transport management role
  - Analyze transport log files to verify the success of the import of transport requests
  - Understand the importance of number range initialization when copying clients
- **Advanced Transport Issues**
  - Be familiar with the sequence of processing when importing ABAP/4 Dictionary objects
  - Be familiar with the roles of the R3trans and tp transport programs during imports
  - Be familiar with the function and structure of R/3 System tables relevant to imports
  - Monitor import/export return codes and analyze errors at the operating system and R/3 System levels
  - Copy a complete development class into 1 change request using the Workbench Browser
  - Be familiar with the behavior of delivery classes and their significance when using client copy and client transport tools, and during imports and upgrades
  - Observe established conventions and standards when releasing changes to downstream systems
  - Be familiar with the limitations of using the automatic import functionality for downstream systems
- **Complex System Landscapes**
  - Be familiar with standards used in extending the standard 3-system landscape environment to 4 or more systems
  - Be familiar with the maintenance of the R/3 Transport System tables - TSYST, TASYS, DEVL, and TWSYS - and their roles in extending a system landscape
  - Be familiar with procedures for transporting between multiple Development Systems and the Integration System
  - Be familiar with how the use of C type transports provides managed development and transport control through the ”check-out/check-in” functionality
- **Upgrading a System Landscape**
  - Develop and implement an optimal upgrade strategy
  - Register an SAP-owned repository object for modification
  - Be familiar with the different database archiving options used during R/3 Upgrades
  - Understand an SPDD adjustment of an ABAP/4 Dictionary object
  - Understand an SPAU adjustment of R/3 System objects
  - Be familiar with the SAP Enhancement Concept and adding new functionality to R/3

- Be familiar with the use of the Online Correction Service (OCS) and Hot Packages for program corrections and patches

4.4 Test: CBC090- R/3- MS Windows NT Operating System Interface

4.4.1 Overview

The R/3 - Operating System Interface tests are available in the following versions:

CBC090- R/3 - MS Windows NT Operating System Interface
CBC091- R/3 - Unix Operating System Interface
CBC525- R/3 - AS/400 System Administration (includes DB2/400)

Certification candidates applying for an MS Windows NT oriented certification must successfully complete the CBC090- R/3 - MS Windows NT Operating System Interface test and the corresponding database and R/3 Basis (CBCTCC) test modules.

The CBC090 test applies towards the SAP R/3 Technical Consultant certification for the following MS Windows NT variations:

R/3 Release 3.0, MS Windows NT, Oracle
R/3 Release 3.0, MS Windows NT, Adabas D
R/3 Release 3.0, MS Windows NT, Informix
R/3 Release 3.0, MS Windows NT, SQL Server

The goal of the R/3 Operating System Interface tests is to establish whether a test participant has a good understanding of the R/3 System interface to a supported host operating system.

Certification candidates can prepare themselves for the R/3 Operating System Interface tests by attending the respective R/3 Technical Core Competence (TCC) and R/3 Installation courses, operating system and networking training, and through supplementary practical experience.

The test duration is 1 hour and consists of approximately 40 multiple-choice and free-text questions taken from the following topics:

1.1.2 R/3-MS Windows NT Operating System Interface test topics

- **Installation overview**
  - Identify the local and system-wide (global) shared file and directory resources in a networked R/3 environment
  - Identify the operating system and R/3 processes and understand their basic functions
  - Be familiar with R/3 interprocess communication within an SAP network
  - Be familiar with the significance of the SAP System Number and its use in a networked R/3 environment
- **Installation planning and prerequisites**
  - Be familiar with the system sizing and layout factors which are used when customers order hardware for an R/3 System
  - Be familiar with the tasks for which a customer is responsible before an installation and discuss them with the customer
  - Be familiar with R/3 System data security and performance requirements
  - Identify incorrect disk layout plans and implement measures to bring them into compliance with data security and performance standards
  - Review system sizing and device layout plans
  - Discuss installation activities with customers
  - Acquire and review R/3 installation manuals and Notes before beginning an installation
  - Develop a complete R/3 Installation strategy before beginning an installation
- **R/3 System Definition**
  - Distribute critical database, operating system, and R/3 Instance components to comply with SAP disk layout standards
  - Use the SAPFS file to determine disk layout parameters and database structure requirements
  - Be familiar with optimal and minimal disk layout configurations
  - Be familiar with RAID implementations and the advantages and disadvantages of using RAID technology
  - Be familiar with the advantages and disadvantages of using device mirroring technology
  - Use the SAP tools - R3INST and SAPLICENSE
  - Be familiar with the limitations of the installation tools and manually perform other installation tasks as required
  - Be familiar with the operating system level directories, parameter files, and log files which are created and modified during an R/3 installation
  - Implement security and performance measures in the setup of a Windows NT Domain for 1 or more SAP Instances
  - Perform preinstallation checks and setup activities - hardware and software checks, create domain users, database software installation

- Install an R/3 Central Instance, create and load the R/3 database, import ABAP/4 report loads, and install a Dialog Instance
- Use the Workbench Organizer to setup systems in an R/3 System Landscape
- Set up directory sharing for distributed R/3 Instances in a LAN environment
- Backup the R/3 System installation and perform other post installation activities
- Be familiar with the standards, procedures, and restrictions used for copying an R/3 System in homogeneous and heterogeneous hardware environments
- Copy an R/3 System to another computer
- Verify an R/3 System installation at the hardware, operating system, network, database, and R/3 Instance levels

· **Language Import**
- Be familiar with the Multinational National Language Support (MNLS) concept and its use in providing international language support
- Modify the R/3 Instance profile for specific languages
- Be familiar with the restrictions and requirements of the SMLT transaction
- Use transaction SMLT to import and supplement new languages
- Understand the concept and procedures for Full and Delta language imports
- Supplement newly installed languages from already existing languages
- Be familiar with the structure of the TLSY2 table and its role in language supplementing

· **Desktop Installation**
- Advise customers on R/3 Desktop integration strategies based upon their hardware resources and organizational requirements
- Implement an R/3 Desktop integration plan to minimize the administration expenditure for upgrading and maintaining the frontend software
- Be familiar with TCP/IP communication and networking concepts and practices
- Install and upgrade the components of the SAP Frontend Software in heterogeneous hardware and network environments
- Be familiar with handling and configuring the Desktop Software installation using the SAPSETUP tool
- Install and set up the Desktop Software for local file access and for access over a LAN
- Be familiar with the advantages and disadvantages of local and LAN file access and installation methods
- Be familiar with the special installation strategies for R/3 Frontend Software installations over remote connections and in WAN's

· **Set up SAP Remote Connection**
- Be familiar with the current LAN and WAN networking protocols and standards supported and required by SAP
- Be familiar with the SAP worldwide support network infrastructure and the concept of 24 hour support
- Establish a connection to an SAP Server system and download files
- Establish a remote connection to SAP and test the connection

- Understand the SAProuter concept and its role in remote connection to SAP
- Install and set up SAProuter to communicate with network devices using unofficial IP addresses
- Be familiar with the saprouttab file format and usage
- Be familiar with the SAProuter programs startup and runtime requirements and restrictions
- Be familiar with hardware router configuration and implementation concepts, standards, and security requirements
- Restrict access into an SAP System by configuring SAProuter to work with a hardware router
- Setup the R/3 System for OSS and be familiar with its function and usage

4.5 Test: CBC091- R/3 - Unix Operating System Interface

4.5.1 Overview

The R/3 - Operating System Interface tests are available in the following versions:

CBC090- R/3 - MS Windows NT Operating System Interface
CBC091- R/3 - Unix Operating System Interface
CBC525- R/3 - AS/400 System Administration (includes DB2/400)

Certification candidates applying for a Unix oriented certification must successfully complete the CBC091- R/3 - Unix Operating System Interface test and the corresponding database and R/3 Basis (CBCTCC) test modules.

The CBC091 test applies towards the SAP R/3 Technical Consultant certification for the following Unix variations:

R/3 Release 3.0, Unix, Oracle
R/3 Release 3.0, Unix, Informix
R/3 Release 3.0, Unix, Adabas D

The goal of the R/3 Operating System Interface tests is to establish whether a test participant has a good understanding of the R/3 System interface to a supported host operating system.

Certification candidates can prepare themselves for the R/3 Operating System Interface tests by attending the respective R/3 Technical Core Competence (TCC) and R/3 Installation courses, operating system and networking training, and through supplementary practical experience.

The test duration is 1 hour and consists of approximately 40 multiple-choice and free-text questions taken from the following topics:

4.5.2 R/3-Unix Operating System Interface test topics

- **Installation overview**
  - Identify the local and system-wide (global) shared file and directory resources in a networked R/3 environment
  - Identify the operating system and R/3 processes and understand their basic functions
  - Be familiar with R/3 interprocess communication within an SAP network
  - Be familiar with the significance of the SAP System Number and its use in a networked R/3 environment
- **Installation planning and prerequisites**
  - Be familiar with the system sizing and layout factors which are used when customers order hardware for an R/3 System
  - Be familiar with the tasks for which a customer is responsible before an installation and discuss them with the customer
  - Be familiar with R/3 System data security and performance requirements
  - Identify incorrect disk layout plans and implement measures to bring them into compliance with data security and performance standards
  - Review system sizing and device layout plans
  - Discuss installation activities with customers
  - Acquire and review R/3 installation manuals and Notes before beginning an installation
  - Develop a complete R/3 Installation strategy before beginning an installation
- **R/3 System Definition**
  - Distribute critical database, operating system, and R/3 Instance components to comply with SAP disk layout standards
  - Use the SAPFS file to determine disk layout parameters and database structure requirements
  - Be familiar with optimal and minimal disk layout configurations
  - Be familiar with RAID implementations and the advantages and disadvantages of using RAID technology
  - Be familiar with the advantages and disadvantages of using device mirroring technology
  - Use the SAP tools - R3INST and SAPLICENSE
  - Be familiar with the limitations of the installation tools and manually perform other installation tasks as required
  - Be familiar with the operating system level directories, parameter files, and log files which are created and modified during an R/3 installation
  - Perform preinstallation checks and setup activities - hardware and software checks, create operating system users, modify the Unix kernel, database software installation
  - Install an R/3 Central Instance, create and load the R/3 database, import ABAP/4 report loads, and install a Dialog Instance
  - Use the Workbench Organizer to set up systems in an R/3 System Landscape

- Set up directory sharing for distributed R/3 Instances and Unix R/3 Frontends in a LAN environment
- Backup the R/3 System installation and perform other post installation activities
- Install R/3 Instances in a heterogeneous Unix hardware environment
- Be familiar with the concepts, procedures, and restrictions used for copying an R/3 System in homogeneous and heterogeneous hardware environments
- Copy an R/3 System to another computer
- Verify R/3 System installation at the hardware, operating system, network, database, and R/3 Instance levels

· **Language Import**
- Be familiar with the Multinational National Language Support (MNLS) concept and its use in providing international language support
- Modify the R/3 Instance profile for specific languages
- Be familiar with the restrictions and requirements of the SMLT transaction
- Use transaction SMLT to import and supplement new languages
- Understand the concept and procedures for Full and Delta language imports
- Supplement newly installed languages from already existing languages
- Be familiar with the structure of the TLSY2 table and its role in language supplementing

· **Desktop Installation**
- Advise customers on R/3 Desktop integration strategies based upon their hardware resources and organizational requirements
- Implement an R/3 Desktop integration plan to minimize the administration expenditure for upgrading and maintaining the frontend software
- Be familiar with TCP/IP communication and networking concepts and practices
- Install and upgrade the components of the SAP Frontend Software in heterogeneous hardware and network environments
- Be familiar with handling and configuring the Desktop Software installation using the SAPSETUP tool
- Install and set up the Desktop Software for local file access and for access over a LAN
- Be familiar with the advantages and disadvantages of local and LAN file access and installation methods
- Be familiar with the special installation strategies for R/3 Frontend Software installations over remote connections and in WAN's

· **Set up SAP Remote Connection**
- Be familiar with the current LAN and WAN networking protocols and standards supported and required by SAP
- Be familiar with the SAP worldwide support network infrastructure and the concept of 24 hour support
- Establish a connection to an SAP Server system and download files
- Establish a remote connection to SAP and test the connection
- Understand the SAProuter concept and its role in remote connection to SAP
- Install and set up SAProuter to communicate with network devices using unofficial IP addresses

- Be familiar with the saprouttab file format and usage
- Be familiar with the SAProuter programs startup and runtime requirements and restrictions
- Be familiar with hardware router configuration and implementation concepts, standards, and security requirements
- Restrict access into an SAP System by configuring SAProuter to work with a hardware router
- Setup the R/3 System for OSS and be familiar with its function and usage

4.6 Test: CBC505- R/3 - Oracle Database Administration

4.6.1 Overview

The R/3 - Database Administration tests are available in the following versions:

CBC505- R/3 - Oracle Database Administration
CBC510- R/3 - Informix Database Administration
CBC515- R/3 - Adabas D Database Administration
CBC520- R/3 - MS SQL Server Database Administration
CBC525- R/3 - AS/400 System Administration (includes DB2/400)

Certification candidates applying for an Oracle oriented certification must successfully complete the CBC505- R/3 - Oracle Database Administration test together with the respective R/3- Operating System Interface test and the R/3 Basis System (CBCTCC) test.

The CBC505 test currently applies towards the SAP R/3 Technical Consultant certification for the following R/3 System variations:

R/3 Release 3.0, Unix, Oracle
R/3 Release 3.0, MS Windows NT, Oracle

The goal of the R/3 Database Administration tests is to establish whether a test participant has a good understanding of the R/3 System interface to a supported database system.

Certification candidates can prepare themselves for the R/3 Database Administration tests by attending the respective R/3 Database Administration course (BC500 series), database manufacturer's training, and through supplementary practical experience.

This test consists of approximately 40 multiple-choice and free-text questions taken from the following topics:

4.6.2 R/3- Oracle Database Administration test topics

- **ORACLE 7 Database Architecture in the R/3 Environment**
  - Be familiar with Oracle processes and files
  - Understand the Oracle redo log mechanism
  - Use Oracle tools to startup and shutdown the database
  - Be familiar with the SAP R/3 naming conventions for Oracle files
  - Schedule database administration tasks
- **Database Backup Strategy**
  - Understand R/3 System security aspects relative to the Oracle database
  - Be familiar with SAP database backup tools
  - Be familiar with backup and archive types
  - Use SAP tools to plan and implement backup strategies
  - Use the CCMS for backup maintenance
  - Schedule backup execution and monitor backups
- **SAP Tape Management**
  - Use SAP tools for tape initialization
  - Understand tape management and selection by SAP tools
  - Be familiar with the tape structures used by SAP tools
- **Database Restore and Recovery**
  - Understand Oracle recovery types and mechanisms
  - Be able to handle Oracle media errors
  - Run a restore of SAP database backups
  - Be familiar with all SAP recovery phases
- **Storage Management and Problem Avoidance**
  - Be familiar with disk space requirements
  - Understand storage space management
  - Verify that the setup of filesystems, directories, and devices comply with SAP data security and performance standards
  - Be familiar with SAP R/3 Oracle naming conventions for tablespaces
  - Understand database fragmentation
  - Schedule and understand database monitoring
  - Analyze, plan, and schedule database reorganization
  - Be familiar with the concepts and conventions for modifications of very large Oracle databases
  - Understand the advantages and disadvantages of an Oracle raw device implementation
  - Install an R/3 System using Oracle with raw devices for the data areas
- **A Week in the life of a DBA**
  - Be familiar with R/3 System database administration tasks relative to Oracle
  - Use SAP database monitoring tools
  - Monitor database freespace situations
  - Monitor database backups
  - Be familiar with database performance monitoring

- Be familiar with database index monitoring
- Resolve archiver stuck situations
- Handle disk crashes
- Be familiar with the concepts, procedures, and restrictions used for copying a database in homogeneous and heterogeneous hardware platform environments
- Copy an Oracle database so it may be used to install another R/3 System

- **Top 10 Problems**
  - Handle Oracle tablespace overflows
  - Resolve archiving errors
  - Resolve table/index problems
  - Manage rollback segments and temporary segments
  - Resolve backup and tape errors
  - Use and understand database freespace checks

4.7 Test: CBC510- R/3 - Informix Database Administration

4.7.1 Overview

The R/3 - Database Administration tests are available in the following versions:

CBC505- R/3 - Oracle Database Administration
CBC510- R/3 - Informix Database Administration
CBC515- R/3 - Adabas D Database Administration
CBC520- R/3 - MS SQL Server Database Administration
CBC525- R/3 - AS/400 System Administration (includes DB2/400)

Certification candidates applying for an Informix oriented certification must successfully complete the CBC510- R/3 - Informix Database Administration test together with the respective R/3- Operating System Interface test and the R/3 Basis System test (CBCTCC).

The CBC510 test currently applies towards the SAP R/3 Technical Consultant certification for the following R/3 System variations:

R/3 Release 3.0, Unix, Informix
R/3 Release 3.0, MS Windows NT, Informix

The goal of the R/3- Database Administration tests is to establish whether a test participant has a good understanding of the R/3 System interface to a supported database system.

Certification candidates can prepare themselves for the R/3 Database Administration tests by attending the respective R/3 Database Administration course (BC500 series), database manufacturer's training, and through supplementary practical experience.

This test consists of approximately 40 multiple-choice and free-text questions taken from the following topics:

4.7.2 R/3- Informix Database Administration test topics

- **Installation checks**
  - Be familiar with system configurations having 1 or more R/3 System Instance and 1 or more Informix database instance
  - Identify and distinguish between text files, binary executables, R/3 System specific data files, and Informix raw device files
  - Verify that the setup of the file systems, directories, and Informix raw devices comply with SAP data security and performance standards
  - Be familiar with the administrative, security, and performance issues relating to Informix logs and to the logdbs, physdbs and rootdbs dbspaces
  - Identify and maintain the $ONCONFIG parameters which are critical for R/3 System data security and performance
  - Identify the $ONCONFIG parameters influenced by the operating system level configuration, such as operating system level mirroring versus Informix mirroring, or an increase in the number of CPUs
  - Set up and maintain secure user access for the sapr3 operating system user to data stored in the database
  - Be familiar with the Unix concept of symbolic links and the administration of physical, logical, and raw devices in an Informix database and R/3 System environment
  - Understand the implications of dbspace chunk layout in terms of database archive strategy and performance monitoring
  - Analyze Informix database errors
  - Implement Network File System configurations
  - Understand Informix and R/3 interprocess communication using shared-memory and TCP/IP socket mechanisms
- **Storage management**
  - Implement Informix storage management standards and conventions for R/3 Systems
  - Implement data security and performance conventions for dbspace/chunk layout during the installation and administration of the database
  - Plan the R/3 System installation taking into account the critical importance of the dbspaces rootdbs, logdbs and physdbs and the mapping of their primary and mirror chunks onto physical devices
  - Understand the implications of the implementation of the varying forms of redundancy, such as mirroring and RAID 5, on dbspace/chunk layout
  - Be familiar with the options and limitations of creating raw partitions on physical or logical volumes
  - Be familiar with the elements of space management, e.g. monitoring at dbspace, chunk, device, and table/index levels
  - Use SAPDBA for database monitoring, reorganizing, extending, analyzing, and maintenance
  - Understand the different ways to reorganise a dbspace
  - Be familiar with the way in which an SQL request from an R/3 System to the Informix database is resolved

- Be aware of the critical importance of "update statistics" for the Informix cost-based optimiser
- Use database performance monitoring to identify and resolve system performance deficiencies
- Be familiar with the concepts, procedures, and restrictions used for copying a database in homogeneous and heterogeneous hardware platform environments
- Copy an INFORMIX database so it may be used to install another R/3 System

- **Database archive and logical log backup strategy**
  - Make informed decisions about the data archive and backup strategy for an installation
  - Configure ON-Archive to prepare a newly installed database for archiving and logical log backups
  - Be familiar with the basic concepts of data security for an INFORMIX database and implement concrete strategies
  - Understand the difference between the "data" dbspaces and the logging dbspaces - logdbs and physdbs
  - Understand why dbspaces are archived while logical log files are backed up and why both are critical
  - Use ON-Archive for archiving dbspaces and for backing-up the logical log files
  - Use ondatartr to perform a cold restore
  - Perform an emergency logical log backup to resolve a logs-full situation and later catalog the critical logs
  - Be familiar with the use and limitations of the ontape utility
  - Implement high-availability practices in database archive and logical log backup planning
  - Be familiar with sequential and parallel archiving procedures
  - Differentiate between and create full and incremental database archives in attended and in unattended mode
  - Use automatic logical log backup to secure your logical logs at pre-specified times when activity is low
  - Implement a successful tape cycling strategy
  - Implement SAP recommended archiving and backup practices and procedures
  - Implement measures to reduce the likelihood of a long transaction situation
  - Perform and monitor database archives and logical log backups from within R/3 using the CCMS DBA-Calendar
- **A week in the life of a DBA**
  - Plan and implement procedures for preventative, reactionary, and periodic tasks that an Informix database administrator must perform weekly
  - Implement customer specific solutions based upon their unique system requirements in terms of hardware configuration, R/3 application module and Informix database workload
- **Top problems**
  - Be familiar with the most common problems faced by a database administrator
  - Successfully resolve problems and take measures to prevent recurrences

- Implement preventive maintenance and periodic monitoring practices to avoid problems

4.8 Test: CBC515- R/3 - Adabas D Database Administration

4.8.1 Overview

The R/3 - Database Administration tests are available in the following versions:

CBC505- R/3 - Oracle Database Administration
CBC510- R/3 - Informix Database Administration
CBC515- R/3 - Adabas D Database Administration
CBC520- R/3 - MS SQL Server Database Administration
CBC525- R/3 - AS/400 System Administration (includes DB2/400)

Certification candidates applying for an Adabas D oriented certification must successfully complete the CBC515- R/3 - Adabas D Database Administration test together with the respective R/3- Operating System Interface test and the R/3 Basis System test (CBCTCC).

The CBC515 test currently applies towards the SAP R/3 Technical Consultant certification for the following R/3 System variations:

R/3 Release 3.0, Unix, Adabas D
R/3 Release 3.0, MS Windows NT, Adabas D

The goal of the R/3- Database Administration tests is to establish whether a test participant has a good understanding of the R/3 System interface to a supported database system.

Certification candidates can prepare themselves for the R/3 Database Administration tests by attending the respective R/3 Database Administration course (BC500 series), database manufacturer's training, and through supplementary practical experience.

This test consists of approximately 40 multiple-choice and free-text questions taken from the following topics:

4.8.2 R/3- Adabas D Database Administration test topics

- **Adabas D and the 3 tier Architecture of the SAP R/3 System**
  - Understand how an R/3 instance logs on to the Adabas D database locally and via a remote network connection
  - Be familiar with how R/3 user processes log on to the R/3 System
  - Be familiar with the roles of the 3 layers of the R/3 System Architecture - Presentation, Application, and Database
  - Be familiar with the components of the Adabas D Server and their purposes
  - Be familiar with the SQL modes understood by Adabas D
  - Understand the basic functionality of the R/3 transport system
- **Adabas D Process Architecture**
  - Identify the most important Adabas D kernel parameters and modify them using CONTROL
  - Identify the most important Adabas D processes and their tasks
  - Identify the operating system and database users from an R/3 installation and their roles
  - Change passwords using both QUERY and XUSER
  - Understand the concept of direct logon to the database through a hidden file edited by XUSER
  - Be familiar with the contents of the directories located in the database root directory DBROOT
  - Be familiar with CONTROL and its most important functions
  - Be familiar with the difference between the two methods that change the state of the database from WARM to COLD
  - Be familiar with the sequence of events for starting and stopping the R/3 System
- **Disk Areas and Logging**
  - Be familiar with the meaning of SYSTEM DEVSPACE, transaction log, archive log, and DATA DEVSPACE
  - Be familiar with the functioning and use of Adabas D log modes
  - Be familiar with the concepts: devspace, log segmentation, checkpoint, and savepoint
  - Implement security and performance standards and conventions for the distribution of database components in RAID and non-RAID system configurations
  - Alter an existing configuration using CONTROL
- **Database Backups**
  - Perform a database backup by doing a data backup
  - Perform additional backups by saving the log
  - Identify the differences between save log and save log segment
  - Be familiar with the concepts of save data, save pages, and parallel backup
  - Be familiar with the Media Manager and how to use it
  - Implement a correct backup strategy
  - Be familiar with the CCMS Scheduler and be able to use it
- **Database restore**

- Restore a database by doing a data and log restore
- Restore the archive log, while running in log mode DUAL, without downtime
- Be familiar with typical recovery cases and steps necessary to reimport data
- Be familiar with the location, contents, and analysis of diagnostic files
- Restore the database after the loss of a data devspace
- Restore the database using incremental backups
- Restore the database by importing log backups
- Repair the archive log in Single and in Dual log mode
- Be familiar with the concepts, procedures, and restrictions used for copying a database in homogeneous and heterogeneous hardware platform environments
- Copy an ADABAS D database so it may be used to install another R/3 System

- **Recognizing and resolving problem situations**
  - Identify typical problem situations and the logical steps used in handling them
  - Identify and respond to a log full or database full condition without loss of data
  - Be familiar with update statistics and verify
  - Perform daily administrative tasks using the database Alert Monitor

4.9 Test: CBC520- R/3 - MS SQL Server Database Administration

4.9.1 Overview

The R/3 - Database Administration tests are available in the following versions:

CBC505- R/3 - Oracle Database Administration
CBC510- R/3 - Informix Database Administration
CBC515- R/3 - Adabas D Database Administration
CBC520- R/3 - MS SQL Server Database Administration
CBC525- R/3 - AS/400 System Administration (includes DB2/400)

Certification candidates applying for an MS SQL Server oriented certification must successfully complete the CBC520- R/3 - MS SQL Server Database Administration test together with the CBC090- R/3 - MS Windows NT Operating System Interface test and the R/3 Basis System test (CBCTCC).

The CBC520- R/3- MS SQL Server Database Administration test currently applies towards the SAP R/3 Technical Consultant certification for the following R/3 System variation:

R/3 Release 3.0, MS Windows NT, MS SQL Server

The goal of the R/3- Database Administration tests is to establish whether a test participant has a good understanding of the R/3 System interface to a supported database system.

Certification candidates can prepare themselves for the R/3 Database Administration tests by attending the respective R/3 Database Administration course (BC500 series), database manufacturer’s training, and through supplementary practical experience.

This test consists of approximately 40 multiple-choice and free-text questions taken from the following topics:

1.1.2 R/3- MS SQL Server Database Administration test topics

- **SQL Server Architecture**
  - Be familiar with the NT services and processes that make up a SQL Server system
  - Understand the communication interface between database client programs and the database server
  - Be familiar with the NT thread concept used within SQL Server
  - Understand the SQL Server storage architecture (database, devices, files, extents)
  - Explain the usage of the SQL Server specific databases
  - Understand the concept of transaction logging
  - Explain the difference between clustered and non-clustered indexes
  - Understand locking in SQL Server
- **SQL Server with R/3**
  - Explain the 3 tier architecture with SQL Server
  - Understand the execution path of an Open SQL statement
  - Understand the connections of R/3 work processes to SQL Server
  - Verify the correct device distribution of an R/3 database in SQL Server
  - Explain the mapping of R/3 dictionary objects to database objects
- **Database Backups**
  - Understand the technical procedure of a database and a transaction log backup
  - Explain the necessary conditions for a save backup strategy
  - Understand the SAP recommended tape management
  - Perform a database backup using CCMS tools
  - Perform a transaction log backup using Enterprise Manager
  - Backup the device fragmentation information and explain why it is important
  - Understand how backups scheduled via CCMS work
  - Explain how to check a database backup
- **Database restore**
  - Understand the principle steps of a database restore
  - Explain the possible reasons for a database restore and recovery
  - Understand the difference of master device or other database device loss
  - Recreate a lost database with the previous device fragmentation
  - Perform a restore from history
  - Perform a restore from device
  - Perform a point in time recovery
  - Explain how to check the consistency of a restored and recovered database
- **Regular Maintenance and Error / Alert Handling**
  - Explain the different regular database maintenance tasks
  - Expand an R/3 database device and the R/3 database on it
  - Schedule a complete R/3 database consistency check with CCMS
  - Schedule an update statistics task with CCMS and explain what it does
  - Be familiar with changing SQL Server configuration parameters
  - Be familiar with the locations where database error message may be seen
  - Be familiar with the database alert monitor in CCMS

- Change database alert thresholds within CCMS
- Explain how to handle a full R/3 transaction log

- **Database Performance Monitoring and Tuning**
  - Understand the SQL Server data and procedure cache usage with R/3
  - Verify the correct sizing of the data and procedure cache
  - Explain how to detect a lock wait situation
  - Be familiar with using ST05 trace with SQL Server
  - Explain several possibilities to detect poorly qualified SQL statements
  - Understand the index statistics pages
  - Interpret the output of the stored procedure name cache statistics
  - Explain the rules for creating a good index

4.10 Test: CBC525- R/3 - AS/400 System Administration

4.10.1 Overview

The R/3 - AS/400 System test consists of test items covering the following areas:

R/3 - OS/400 System Administration
R/3 - DB2/400 Database Administration

Each certification candidate must successfully complete the CBC525- R/3 - AS/400 System Administration test together with the R/3 Basis System test (CBCTCC).

The CBC525 test applies towards the SAP R/3 Technical Consultant certification for the following R/3 System variation:

R/3 Release 3.0, AS/400 (includes OS/400 and DB2/400)

The goal of the R/3 - AS/400 System Administration test is to establish whether a test participant has a good understanding of the R/3 System interface to the AS/400 System.

Certification candidates can prepare themselves for the R/3 - AS/400 System Administration test by attending the respective R/3 Basis System and IBM AS/400 System Administration courses and by supplementing the classroom training through practical experience.

This test consists of approximately 80 multiple-choice questions taken from the following topics:

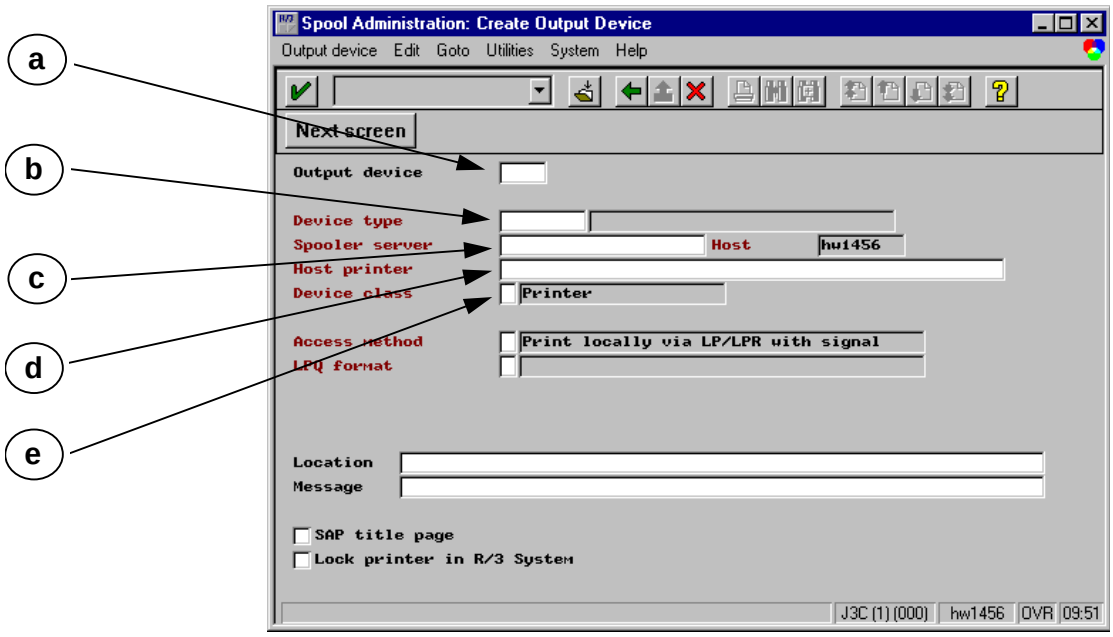
4.10.2 R/3- AS/400 test topics

- **DB2/400 Architecture and Naming Conventions**
  - Three-Tier System
  - The R/3 Work Processes
  - Local and Remote Database Access
  - The Integration of DB/2 into the Operating System
  - The Integrated File System (IFS)
  - The R/3 File System
  - The R/3 Libraries
  - The Optimizer
  - The SQL Collection
  - Journaling
  - SQL Packages
  - User Profiles on AS/400
- **System Configuration and Architecture**
  - Hardware Requirements
  - Elements of System Configuration
  - Memory Pools
  - Job State Transitions
  - Changing Pool Parameters
  - Disk Layout
  - Commitment Control
  - Displaying Journal Entries
  - Checking the PTF Level
  - Optimizing AS/400 Performance
- **DB2/400 Backup and Recovery**
  - Backing up the Database Library
  - The Save-While-Active Option
  - Backing up Journal Receivers
  - Backup up IFS
  - Backing up SQL Packages
  - Tape Management
  - Restoring the Database Library
  - Restoring the SQL Packages
  - Which objects are journaled?
  - Types of Journal Entries
  - Commitment Boundaries
  - Resetting the Database
  - Backout Recovery
  - Forward Recovery
- **DB2/400 Performance Monitoring Tools**
  - The Workload Monitor
  - The DB2/400 Database Monitor

- The Operating System Monitor

4.11 Sample test questions:

4.11.1 R/3 Basis System



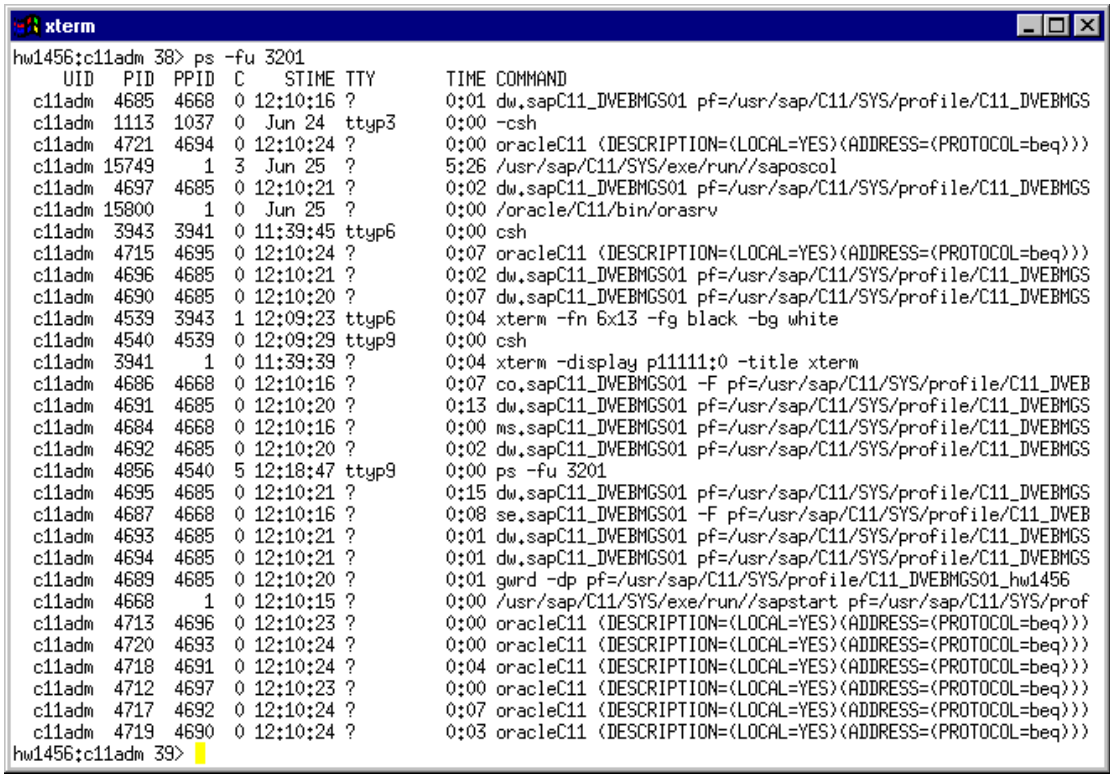
In the above R/3 System Spool Administration - Create Output Device screen please identify the following:
1. If you are setting-up a laser printer for R/3, which field should be used for entering the printer manufacturer's printer model name?

_____ a. Output device
_____ b. Device type
_____ c. Spool server
_____ d. Host printer
_____ e. Device class

2. In which field should the printer name be entered, as it is known at the operating system level of the R/3 Application Server?

_____ a. Output device
_____ b. Device type
_____ c. Spool server
_____ d. Host printer
_____ e. Device class

4.11.2 R/3- Operating System Interface



```
xterm
hw1456:c11adm 38> ps -fu 3201
     UID   PID  PPID  C    STIME TTY      TIME COMMAND
  c11adm  4685  4668  0 12:10:16 ?        0:01 dw.sapC11_DVEBMGS01 pf=/usr/sap/C11/SYS/profile/C11_DVEBMGS
  c11adm  1113  1037  0  Jun 24  ttyp3    0:00 -csh
  c11adm  4721  4694  0 12:10:24 ?        0:00 oracleC11 (DESCRIPTION=(LOCAL=YES)(ADDRESS=(PROTOCOL=beq)))
  c11adm 15749     1  3  Jun 25  ?        5:26 /usr/sap/C11/SYS/exe/run//saposcol
  c11adm  4697  4685  0 12:10:21 ?        0:02 dw.sapC11_DVEBMGS01 pf=/usr/sap/C11/SYS/profile/C11_DVEBMGS
  c11adm 15800     1  0  Jun 25  ?        0:00 /oracle/C11/bin/orasrv
  c11adm  3943  3941  0 11:39:45 ttyp6    0:00 csh
  c11adm  4715  4695  0 12:10:24 ?        0:07 oracleC11 (DESCRIPTION=(LOCAL=YES)(ADDRESS=(PROTOCOL=beq)))
  c11adm  4696  4685  0 12:10:21 ?        0:02 dw.sapC11_DVEBMGS01 pf=/usr/sap/C11/SYS/profile/C11_DVEBMGS
  c11adm  4690  4685  0 12:10:20 ?        0:07 dw.sapC11_DVEBMGS01 pf=/usr/sap/C11/SYS/profile/C11_DVEBMGS
  c11adm  4539  3943  1 12:09:23 ttyp6    0:04 xterm -fn 6x13 -fg black -bg white
  c11adm  4540  4539  0 12:09:29 ttyp9    0:00 csh
  c11adm  3941     1  0 11:39:39 ?        0:04 xterm -display p11111:0 -title xterm
  c11adm  4686  4668  0 12:10:16 ?        0:07 co.sapC11_DVEBMGS01 -F pf=/usr/sap/C11/SYS/profile/C11_DVEB
  c11adm  4691  4685  0 12:10:20 ?        0:13 dw.sapC11_DVEBMGS01 pf=/usr/sap/C11/SYS/profile/C11_DVEBMGS
  c11adm  4684  4668  0 12:10:16 ?        0:00 ms.sapC11_DVEBMGS01 pf=/usr/sap/C11/SYS/profile/C11_DVEBMGS
  c11adm  4692  4685  0 12:10:20 ?        0:02 dw.sapC11_DVEBMGS01 pf=/usr/sap/C11/SYS/profile/C11_DVEBMGS
  c11adm  4856  4540  5 12:18:47 ttyp9    0:00 ps -fu 3201
  c11adm  4695  4685  0 12:10:21 ?        0:15 dw.sapC11_DVEBMGS01 pf=/usr/sap/C11/SYS/profile/C11_DVEBMGS
  c11adm  4687  4668  0 12:10:16 ?        0:08 se.sapC11_DVEBMGS01 -F pf=/usr/sap/C11/SYS/profile/C11_DVEB
  c11adm  4693  4685  0 12:10:21 ?        0:01 dw.sapC11_DVEBMGS01 pf=/usr/sap/C11/SYS/profile/C11_DVEBMGS
  c11adm  4694  4685  0 12:10:21 ?        0:01 dw.sapC11_DVEBMGS01 pf=/usr/sap/C11/SYS/profile/C11_DVEBMGS
  c11adm  4689  4685  0 12:10:20 ?        0:01 gwrd -dp pf=/usr/sap/C11/SYS/profile/C11_DVEBMGS01_hw1456
  c11adm  4668     1  0 12:10:15 ?        0:00 /usr/sap/C11/SYS/exe/run//sapstart pf=/usr/sap/C11/SYS/prof
  c11adm  4713  4696  0 12:10:23 ?        0:00 oracleC11 (DESCRIPTION=(LOCAL=YES)(ADDRESS=(PROTOCOL=beq)))
  c11adm  4720  4693  0 12:10:24 ?        0:00 oracleC11 (DESCRIPTION=(LOCAL=YES)(ADDRESS=(PROTOCOL=beq)))
  c11adm  4718  4691  0 12:10:24 ?        0:04 oracleC11 (DESCRIPTION=(LOCAL=YES)(ADDRESS=(PROTOCOL=beq)))
  c11adm  4712  4697  0 12:10:23 ?        0:00 oracleC11 (DESCRIPTION=(LOCAL=YES)(ADDRESS=(PROTOCOL=beq)))
  c11adm  4717  4692  0 12:10:24 ?        0:07 oracleC11 (DESCRIPTION=(LOCAL=YES)(ADDRESS=(PROTOCOL=beq)))
  c11adm  4719  4690  0 12:10:24 ?        0:03 oracleC11 (DESCRIPTION=(LOCAL=YES)(ADDRESS=(PROTOCOL=beq)))
hw1456:c11adm 39>
```

Using the above Unix process listing please answer the following questions by entering the correct value in the field provided. There is only 1 correct answer per question.

1. What is the process ID for the R/3 dispatcher process?

   _____

2. What is the process ID for the R/3 operating system collector process?

   _____

3. What is the process ID for the R/3 global system log collector process?

   _____

4.11.3 R/3- Database Administration

Why must the R/3 database logs and archive logs reside on physically separate disks?

Choose the correct answer from the following

___ a. to allow better disk access during database backups
___ b. to allow a logical separation of files in separate directories
___ c. to insure data security of log files in case of hardware failure
___ d. to make it easier to reorganize the database when it becomes too big
___ e. to avoid filling the disk with database log files, leaving no disk space for the database archive log files

4.11.4 Answers to the sample test questions:

R/3 Basis System questions:

1. b
2. d

R/3- Operating System Interface questions:

1. 4685
2. 15749
3. 4686

R/3- Database Administration

1. c