

Tips on Mainframe

This BOK is organised in the form of questions and answers. These are some tips on the TSO environment which makes working on TSO easier.

ISPF Environment

1. How do I create multiple instances of ISPF sessions?
 - A. Use PDF command from the TSO panel, which will initiate a new ISPF session, Type =x to comeback to previous ISPF session. You can also type 'start' to initiate a new ISPF session, in this case you have to swap to go to the other session. You can have as many as 6 sessions open.(This command is installation specific)
2. I want to clear off the PF keys that are shown at the bottom of my ISPF panels.
 - A. Use command 'PFSHOW OFF' on command line. If you want to turn it on, issue 'PFSHOW ON'.
3. I typed '/' before pressing some Pfkey and this takes me to some other session
 - A. Character '/' is used as a jump character for going to TPX screen in most of the installations. Therefore typing '/' preceded by a PFkey is as good as going to TPX main menu and going to the corresponding session.
4. How do I see someone else's jobs in IOF/SDSF?
 - A. In IOF menu give 'userid' in SCOPE field. In SDF you may have to type ' u xxxxx' where xxxxx is the id or some other option will be available.
5. How do I compare a specific column in two files on ISPF?
 - A. Go to Option 3.13 (SUPERCE) and type 'edit'. You can give your compare options here. Also, you can specify many other options such as 'treat certain records as comments' etc.
6. How do I recover a Dataset I deleted by mistake, or maybe overwrote?
 - A. Use the TSO command HRECOVER, you'll have to mention the generation or date of the backup you want restored. You can restore it to a new dataset. Usually, HRECOVER option can be found in 'HSM' utility panel.
7. How do you allocate a file similar to existing production file though a job?
 - A. Specify production file as Model dataset. If you want to allocate a file similar to another file you can use the LIKE command and override any DCB parameter that you want different in your file.
8. How do I create a sequential file from VSAM file?
 - A. Use IDCAMS utility with the repro command. You can create a VSAM from a sequential file: the only condition is the sequential file should be sorted on the key fields.
9. How do I compare VSAM datasets?
 - A. Use either compare option in file-aid or 'comparex' utility or 'data-xpert' utility.
10. How do I know which version of Cobol compiler I am using?
 - A. Look at the first line of your compilation listing
11. How do I find out which base cluster does an alternate index file belong to?
 - A. Display information in file aid for the '.PATH' file which will show the base cluster as well as corresponding alt index file.

12. If I am using 3.4 and try to create a new member in an empty PDS, I can't ?
A. Use option 2 and the new member name.
13. I got a B37 abend when tried to save the file.
A. Your PDS is out of space. Start another session open this PDS in 3.4 and put a 'z' next to it. It will compress the PDS. All x37 abends are 'out of space' situations.
14. I got an error message 'NO SPACE IN DIRECTORY' while creating a member in PDS.
A. Your PDS can no longer accommodate more members in it. You need to increase the 'Directory blocks'. Each directory block can hold at least 4 members.
15. I want to copy only the first 500 records of my file.
A. Use file-aid or dataexpert and give the number of records in the option.
16. The dataset I want is migrated, but I don't want my screen to be frozen when I recall it.
A. Type HRECALL next to the dataset name in 3.4
17. I want to send a message to another person logged on to TSO
A. Say 'TSO SEND 'message line' U(user_id)'. If the person is not logged on but you want to send a message which he can read when he logs on say 'TSO SEND 'message line' U(user_id) LOGON'
18. I want to see the LIMIT of a GDG.
A. Use LISTCAT in TSO or File-Aid option 3.2
19. I want to know the % free and other statistics of my dataset.
A. If you press 'right or PF11' on your 3.4 listing you can see the dataset statistics or use option 3.1 and I
20. I keep using certain commands that I want to save.
A. The commands you use regularly can be saved as a function key. E.g. – if you often change a JCL, save it, submit it and then go to the job spool. You could save a PF key as 'save; sub; =IOF'. To do this type 'KEYS' on 'command line' and make the necessary entries.
21. I am not able to delete a dataset that resides on a tape.
A. Yes. You cannot delete/rename a tape dataset. Only you can uncatalog it.

ISPF Editor

22. How do I see only those lines that contain a particular string?
A. Type 'X all' then 'F all *search-string*'
23. Now I want to see only those lines that contain a particular value in the display I get after doing an 'X all, F all'.
A. Type 'F *new_value* all nx'. 'nx' will restrict the search only to the displayed lines.
24. How do I go to a particular line numbers ?
A. Use 'L *search-string*' command. This is the Label command.
25. I want to find for a search-string that is Not prefix/suffix of another word. I want to find for an instance of a search-string that is whole word by itself. How can I do this?
A. Use keyword 'word' at the end of find command. E.g., 'f job word' will find for the whole word 'job'.

26. How do I specify the direction of search i.e., how do I search for a string in backward / forward direction (w.r.t., your current cursor position)?

A.

Direction	Keyword	Example
Backward	PREV	F 'job' PREV finds for string 'job' in backward direction
Forward	No need to mention any keyword. It's default direction	F 'job' finds for string 'job' in forward direction.
From the beginning of the file	FIRST	F 'job' FIRST finds the first instance of sting 'job' in the file.
Count of all instances in file	ALL	F 'job' FIRST finds the first instance of sting 'job' in the file and gives <i>total-no-of-instances</i> of sting 'job' in the file.

27. How do I search for a value say '0980312' stored in comp-3 format?

A. Type F X'0980312'.

28. How do I do case sensitive search find for a given search-string?

A. Just, enclose the search-string within quotes and have a letter C in front of the string itself. For e.g., F C'FindMe' will find all FindMe strings only if the case matches.

29. How do I find for *any* non-blank characters?

A. Use picture string '^'. E.g., "F P'^' 36" will find the next non-blank characters in column 36.

30. How do I find for *any* numeric character?

A. Use picture string '#'. E.g., 1. "F p'#" finds the next numeric character. 2. "F 'PAGE ##' will find the next instance of the string 'page followed by a blank followed by 2 numeric characters'.

- Page 4 of 42

42. How do I make the numbers on Col 1-6 contiguous, i.e., the COBOL numbers
 A. Type 'RENUM'. ISPF sometimes recommends you to do this. You can ignore it.
43. How do I replace a particular value in a particular column with a constant value?
 A. Type *c 'from_value' 'to_value' 6 all*. If you want this change in a particular range of rows, you'll have to block the rows with 'xx' and say *c from_value to_value 6 x all*. Here '6' is the column number.
44. I want to copy a block of records from one dataset to another.
 A. Block the records and type 'CUT' at the command line. Open the other dataset in edit mode and type 'PASTE' at the command line and type 'a' or 'b' on the row after / before which you want these records.
45. I have a file of record length 240 and want to know in which column the value I am looking at occurs.
 A. Say cols on the Command line if in browse mode and in the column command if in edit mode.

File-Aid

46. How do I get record length of a copybook?
 A. Use File-aid option 8
47. File aid says insufficient memory?
 A. Increase region size in TSO logon prompt.
48. Above option is tried but still complete file is not displayed.
 A. Use initial records & skip options.
49. How do I overlay a field with a particular value for all the records in a file?
 A. Use file aid 3.6 option
50. I have multiple record layouts in the copybook. How do I select the record layout of my choice for viewing the file in FileAid?
 A. Type the command USE on command prompt which will show a list of available record lay-outs and you can choose one from them.
51. How do I make file-aid select different record layouts automatically depending upon data content?
 A. Use XREF which allows you to specify what rec lay-out to use under which conditions.
52. In file-aid if I am viewing a file in the formatted mode, how to I go to a particular field?
 A. Type 'L field_name'.

Common Abends:

1. s322 : timed out, try changing job class
2. s806 : load module not found. Check library specified in joblib
3. s913 : Insufficient authority. Check if you have required access to dataset
4. s878 : region size is not enough. Increase the value you have specified in REGION parameter of JOB statement or in EXEC step.
5. s522: job cancelled by either user or operator.
6. s0c4: storage related problem. Check your linkage section, table definition, and FD section.
7. JCL error: file attributes doesn't match; I have given RECFM=VB, RECLLEN is same as that specified in FD section. Why do I get this error? For variable record format files you should add 4 bytes to record length in DCB.
8. s0c7 : Invalid character in COMP/COMP-3 numeric field – check all COMP/COM-3 numeric fields and arithmetic operations.
9. s013 – A file open error.
10. S722 – The Sysout or spool is full. Your program is writing too many things to Sysout. Increase job's sysout limit by specifying 'LINES=(150,WARNING)' option in job statement and then retry. This will increase your sysout limit to '150' *thousand* lines.

COBOL-FAQs

1. Name the divisions in a COBOL program. - GS

IDENTIFICATION DIVISION, ENVIRONMENT DIVISION, DATA DIVISION, PROCEDURE DIVISION.

2. What are the different data types available in COBOL?

Alpha-numeric (X), alphabetic (A) and numeric (9).

3. What does the INITIALIZE verb do? - GS

Alphabetic, Alphanumeric fields & alphanumeric edited items are set to SPACES.
 Numeric, Numeric edited items set to ZERO.
 FILLER , OCCURS DEPENDING ON items left untouched.

4. What is 77 level used for ?

Elementary level item. Cannot be subdivisions of other items (cannot be qualified), nor can they be subdivided themselves.

5. What is 88 level used for ?

For condition names.

6. What is level 66 used for ?

For RENAMEs clause.

7. What does the IS NUMERIC clause establish ?

IS NUMERIC can be used on alphanumeric items, signed numeric & packed decimal items and unsigned numeric & packed decimal items. IS NUMERIC returns TRUE if the item only consists of 0-9. However, if the item being tested is a signed item, then it may contain 0-9, + and - .

8. How do you define a table/array in COBOL?

```
01    ARRAYS.
      05 ARRAY1    PIC X(9) OCCURS 10 TIMES.
      05 ARRAY2    PIC X(6) OCCURS 20 TIMES INDEXED BY WS-INDEX.
```

9. Can the OCCURS clause be at the 01 level?

No.

10. What is the difference between index and subscript? - GS

Subscript refers to the array occurrence while index is the displacement (in no of bytes) from the beginning of the array. An index can only be modified using PERFORM, SEARCH & SET.

Need to have index for a table in order to use SEARCH, SEARCH ALL.

11. What is the difference between SEARCH and SEARCH ALL? - GS

SEARCH - is a serial search.

SEARCH ALL - is a binary search & the table must be sorted

(ASCENDING/DESCENDING KEY clause to be used & data loaded in this order) before using SEARCH ALL.

12. What should be the sorting order for SEARCH ALL? - GS

It can be either ASCENDING or DESCENDING. ASCENDING is default. If you want the search to be done on an array sorted in descending order, then while defining the array, you should give DESCENDING KEY clause. (You must load the table in the specified order).

13. What is binary search?

Search on a sorted array. Compare the item to be searched with the item at the center. If it matches, fine else repeat the process with the left half or the right half depending on where the item lies.

14. My program has an array defined to have 10 items. Due to a bug, I find that even if the program access the 11th item in this array, the program does not abend. What is wrong with it?

Must use compiler option SSRANGE if you want array bounds checking. Default is NOSSRANGE.

15. How do you sort in a COBOL program? Give sort file definition, sort statement syntax and meaning. - GS

Syntax:

```
SORT file-1 ON ASCENDING/DESCENDING KEY key....
USING file-2
GIVING file-3.
```

USING can be substituted by INPUT PROCEDURE IS para-1 THRU para-2
GIVING can be substituted by OUTPUT PROCEDURE IS para-1 THRU para-2.

file-1 is the sort workfile and must be described using SD entry in FILE SECTION.
file-2 is the input file for the SORT and must be described using an FD entry in FILE SECTION and SELECT clause in FILE CONTROL.

file-3 is the outfile from the SORT and must be described using an FD entry in FILE SECTION and SELECT clause in FILE CONTROL.

file-1, file-2 & file-3 should not be opened explicitly.

INPUT PROCEDURE is executed before the sort and records must be RELEASEd to the sort work file from the input procedure.

OUTPUT PROCEDURE is executed after all records have been sorted. Records from the sort work file must be RETURNed one at a time to the output procedure.

16. How do you define a sort file in JCL that runs the COBOL program?

Use the SORTWK01, SORTWK02,..... dd names in the step. Number of sort datasets depends on the volume of data being sorted, but a minimum of 3 is required.

17. What are the two ways of doing sorting in a COBOL program? Give the formats. - GS

See question 16.

18. Give the format of USING and GIVING in SORT statement. What are the restrictions with it? - GS

See question 16. Restrictions - Cannot massage records, cannot select records to be sorted.

19. What is the difference between performing a SECTION and a PARAGRAPH? - GS

Performing a SECTION will cause all the paragraphs that are part of the section, to be performed.

Performing a PARAGRAPH will cause only that paragraph to be performed.

20. What is the use of EVALUATE statement? - GS

Evaluate is like a case statement and can be used to replace nested ifs. The difference between EVALUATE and case is that no 'break' is required for EVALUATE i.e. control comes out of the EVALUATE as soon as one match is made.

21. What are the different forms of EVALUATE statement?

EVALUATE
STATUS

WHEN A=B AND C=D
 imperative stmt
WHEN (D+X)/Y = 4
 imperative stmt
WHEN OTHER
 imperative stmt
END-EVALUATE

EVALUATE SQLCODE ALSO FILE-

WHEN 100 ALSO '00'
 imperative stmt
WHEN -305 ALSO '32'
 imperative stmt
WHEN OTHER
 imperative stmt
END-EVALUATE

EVALUATE SQLCODE ALSO A=B
WHEN 100 ALSO TRUE
 imperative stmt
WHEN -305 ALSO FALSE
 imperative stmt
END-EVALUATE

EVALUATE SQLCODE ALSO TRUE
WHEN 100 ALSO A=B
 imperative stmt
WHEN -305 ALSO (A/C=4)
 imperative stmt
END-EVALUATE

22. How do you come out of an EVALUATE statement? - GS

After the execution of one of the when clauses, the control is automatically passed on to the next sentence after the EVALUATE statement. There is no need of any extra code.

23. In an EVALUATE statement, can I give a complex condition on a when clause?

Yes.

24. What is a scope terminator? Give examples.

Scope terminator is used to mark the end of a verb e.g. EVALUATE, END-EVALUATE; IF, END-IF.

25. How do you do in-line PERFORM? - GS

```
PERFORM ... <UNTIL> ...
<sentences>
END PERFORM
```

26. When would you use in-line perform?

When the body of the perform will not be used in other paragraphs. If the body of the perform is a generic type of code (used from various other places in the program), it would be better to put the code in a separate para and use PERFORM paraname rather than in-line perform.

27. What is the difference between CONTINUE & NEXT SENTENCE ?

CONTINUE is like a null statement (do nothing) , while NEXT SENTENCE transfers control to the next sentence (!!) (A sentence is terminated by a period)

28. What does EXIT do ?

Does nothing ! If used, must be the only sentence within a paragraph in OSVS COBOL. In COBOL II you can have other statements along with EXIT.

29. Can I redefine an X(100) field with a field of X(200)?

Yes. Redefines just causes both fields to start at the same location. For example:
 01 WS-TOP PIC X(1)
 01 WS-TOP-RED REDEFINES WS-TOP PIC X(2).

If you MOVE '12' to WS-TOP-RED,
 DISPLAY WS-TOP will show 1 while
 DISPLAY WS-TOP-RED will show 12.

This works only if the level number is 01. If the respective level numbers were say 05, then you will get a severe error in compilation.

30. Can I redefine an X(200) field with a field of X(100) ?

Yes.

31. What do you do to resolve SOC-7 error? - GS

Basically you need to correct the offending data.

Many times the reason for SOC7 is an un-initialized numeric item. Examine that possibility first.

Many installations provide you a dump for run time abends (it can be generated also by calling some subroutines or OS services thru assembly language). These dumps provide the offset of the last instruction at which the abend occurred. Examine the compilation

output XREF listing to get the verb and the line number of the source code at this offset. Then you can look at the source code to find the bug. To get capture the runtime dumps, you will have to define some datasets (SYSABOUT etc) in the JCL.

If none of these are helpful, use judgement and DISPLAY to localize the source of error.

Some installation might have batch program debugging tools. Use them.

32. How is sign stored in Packed Decimal fields and Zoned Decimal fields?

Packed Decimal fields: Sign is stored as a hex value in the last nibble (4 bits) of the storage.

Zoned Decimal fields: As a default, sign is over punched with the numeric value stored in the last byte.

33. How is sign stored in a comp-3 field? - GS

It is stored in the last nibble. For example if your number is +100, it stores hex 0C in the last byte, hex 1C if your number is 101, hex 2C if your number is 102, hex 1D if the number is -101, hex 2D if the number is -102 etc...

34. How is sign stored in a COMP field ? - GS

In the most significant bit. Bit is on if -ve, off if +ve.

35. What is the difference between COMP & COMP-3 ?

COMP is a binary storage format while COMP-3 is packed decimal format.

36. What is COMP-1? COMP-2?

COMP-1 - Single precision floating point. Uses 4 bytes.

COMP-2 - Double precision floating point. Uses 8 bytes.

37. How do you define a variable of COMP-1? COMP-2?

No picture clause to be given. Example 01 WS-VAR USAGE COMP-1.

38. How many bytes does a S9(7) COMP-3 field occupy ?

Will take 4 bytes. Sign is stored as hex value in the last nibble.

General formula is $\text{INT}((n/2) + 1)$, where $n=7$ in this example.

39. How many bytes does a S9(7) SIGN TRAILING SEPARATE field occupy ?

Will occupy 8 bytes (one extra byte for sign).

40. How many bytes will a S9(8) COMP field occupy ?

4 bytes.

41. What is the maximum value that can be stored in S9(8) COMP?

99999999

42. What is COMP SYNC?

Causes the item to be aligned on natural boundaries. Can be SYNCHRONIZED LEFT or RIGHT.

For binary data items, the address resolution is faster if they are located at word boundaries in the memory. For example, on main frame the memory word size is 4 bytes. This means that each word will start from an address divisible by 4. If my first variable is x(3) and next

one is s9(4) comp, then if you do not specify the SYNC clause, S9(4) COMP will start from byte 3 (assuming that it starts from 0). If you specify SYNC, then the binary data item will start from address 4. You might see some wastage of memory, but the access to this computational field is faster.

43. What is the maximum size of a 01 level item in COBOL I? in COBOL II?

In COBOL II: 16777215

44. How do you reference the following file formats from COBOL programs:

Fixed Block File - Use ORGANISATION IS SEQUENTIAL. Use RECORDING MODE IS F, BLOCK CONTAINS 0 .

Fixed Unblocked - Use ORGANISATION IS SEQUENTIAL. Use RECORDING MODE IS F, do not use BLOCK CONTAINS

Variable Block File - Use ORGANISATION IS SEQUENTIAL. Use RECORDING MODE IS V, BLOCK CONTAINS 0. Do not code the 4 bytes for record length in FD ie JCL rec length will be max rec length in pgm + 4

Variable Unblocked - Use ORGANISATION IS SEQUENTIAL. Use RECORDING MODE IS V, do not use BLOCK CONTAINS. Do not code 4 bytes for record length in FD ie JCL rec length will be max rec length in pgm + 4.

ESDS VSAM file - Use ORGANISATION IS SEQUENTIAL.

KSDS VSAM file - Use ORGANISATION IS INDEXED, RECORD KEY IS, ALTERNATE RECORD KEY IS

RRDS File - Use ORGANISATION IS RELATIVE, RELATIVE KEY IS

Printer File - Use ORGANISATION IS SEQUENTIAL. Use RECORDING MODE IS F, BLOCK CONTAINS 0. (Use RECFM=FBA in JCL DCB).

45. What are different file OPEN modes available in COBOL?

Open for INPUT, OUTPUT, I-O, EXTEND.

46. What is the mode in which you will OPEN a file for writing? - GS

OUTPUT, EXTEND

47. In the JCL, how do you define the files referred to in a subroutine ?

Supply the DD cards just as you would for files referred to in the main program.

48. Can you REWRITE a record in an ESDS file? Can you DELETE a record from it?

Can rewrite(record length must be same), but not delete.

49. What is file status 92? - GS

Logic error. e.g., a file is opened for input and an attempt is made to write to it.

50. What is file status 39 ?

Mismatch in LRECL or BLOCKSIZE or RECFM between your COBOL pgm & the JCL (or the dataset label). You will get file status 39 on an OPEN.

51. What is Static, Dynamic linking?

In static linking, the called subroutine is link-edited into the calling program, while in dynamic linking, the subroutine & the main program will exist as separate load modules. You choose static/dynamic linking by choosing either the DYNAM or NODYNAM link edit option. (Even if you choose NODYNAM, a CALL identifier (as opposed to a CALL literal), will translate to a DYNAMIC call).

A statically called subroutine will not be in its initial state the next time it is called unless you explicitly use INITIAL or you do a CANCEL. A dynamically called routine will always be in its initial state.

52. What is AMODE(24), AMODE(31), RMODE(24) and RMODE(ANY)? (applicable to only MVS/ESA Enterprise Server).

These are compile/link edit options.

AMODE - Addressing mode. RMODE - Residency mode.

AMODE(24) - 24 bit addressing. AMODE(31) - 31 bit addressing. AMODE(ANY) - Either 24 bit or 31 bit addressing depending on RMODE.

RMODE(24) - Resides in virtual storage below 16 Meg line. Use this for 31 bit programs that call 24 bit programs. (OS/VS Cobol pgms use 24 bit addresses only).

RMODE(ANY) - Can reside above or below 16 Meg line.

53. What compiler option would you use for dynamic linking?

DYNAM.

Db2 Fags

1. In the WHERE clause what is BETWEEN and IN? - GS

BETWEEN supplies a range of values while IN supplies a list of values.

2. Is BETWEEN inclusive of the range values specified? - GS

Yes.

3. What is 'LIKE' used for in WHERE clause? What are the wildcard characters? - GS

LIKE is used for partial string matches. '%' (for a string of any character) and '_' (for any single character) are the two wild card characters.

4. When do you use a LIKE statement?

To provide partial search facility e.g. to search employee by name, you need not specify the complete name, using LIKE, you can search for partial string matches.

5. What is the meaning of underscore ('_') in the LIKE statement? - GS

Match for any single character.

6. What do you accomplish by GROUP BY HAVING clause? - GS

Can think of the HAVING as a 'WHERE' clause on the GROUP

7. What is a cursor? why should it be used? - GS

When multiple of rows are to be retrieved with embedded SQL, a cursor should be used.

8. Where would you specify the DECLARE CURSOR statement? - GS

See answer to next question.

9. How do you specify and use a cursor in a COBOL program? - GS

Use DECLARE CURSOR statement either in working storage or in procedure division(before open cursor), to specify the SELECT statement. Then use OPEN, FETCH rows in a loop and finally CLOSE.

10. How would you retrieve rows from a DB2 table in embedded SQL? - GS

Either by using the single row SELECT statements,or by using the CURSOR.

11. What is the COBOL picture clause for a DB2 column defined as DECIMAL(11,2)? - GS

PIC S9(9)V99 COMP-3.

Note: In DECIMAL(11,2), 11 indicates the size of the data type and 2 indicates the precision.

12. What is DCLGEN ? - GS

DeCLarations GENerator: used to create the host language copy books for the table definitions. Also creates the DECLARE table.

13. What are the contents of a DCLGEN? - GS

1. EXEC SQL DECLARE TABLE statement which gives the layout of the table/view in terms of DB2 datatypes.
2. A host language copy book that give the host variable definitions for the column names.

14. Is it mandatory to use DCLGEN? If not, why would you use it at all? - GS

It is not mandatory to use DCLGEN.

Using DCLGEN, helps detect wrongly spelt column names etc. during the precompile stage itself (because of the DECLARE TABLE). DCLGEN being a toll, would generate accurate host variable definitions for the table reducing chances of error.

15. Is DECLARE TABLE in DCLGEN necessary? Why it used?

It not necessary to have DECLARE TABLE statement in DCLGEN. This is used by the pre-compiler to validate the table-name, view-name, column name etc.

16. What is EXPLAIN? - GS

EXPLAIN is used to display the access path as determined by the optimizer for a SQL statement. It can be used in SPUFI (for single SQL statement) or in BIND step (for embedded SQL).

17. What do you need to do before you do EXPLAIN?

Make sure that the PLAN_TABLE is created. Do RUNSTATS. (Any thing else?)

18. Where is the output of EXPLAIN stored? - GS

In userid.PLAN_TABLE

19. EXPLAIN has output with MATCHCOLS = 0. What does it mean? – GS

While doing the accesspath, objects accessed have matching cols as 0, in other words index scan or TS scan is used depending on access type R or I

20. How do you do the EXPLAIN of a dynamic SQL statement?

Using Spufi. At bind time, accesspath are not defined. So all permutation and combinations of SQLs need to be examined separately in spufi.

21. How do you simulate the EXPLAIN of an embedded SQL statement in SPUFI/QMF?
(Give an example with a host variable in WHERE clause.)

22. What are the isolation levels possible ? - GS

CS: Cursor Stability – A read lock is released as soon as access is moved to next page

RR: Repeatable Read – Lock is released only after commit or end of execution

23. Where do you specify them ?

ISOLATION LEVEL is a parameter for the bind process.

24. I use CS and update a page. Will the lock be released after I am done with that page?
No

25. What is ALTER ? - GS

SQL command used to change the definition of DB2 object.

26. What are PACKAGES ? - GS

They contain executable code for SQL statements. Can contain SQL statements for only one DBRM.

Non Executable accesspath instruction for a DBRM.

27. What are the advantages of using a PACKAGE?

In Online Systems – Where there is normally one plan used, You do not have to bind the plan again. So downtime is reduced.

If packages are used than binding changed program is required, however in other case you will have to bind whole plan.

28. What is RUNSTATS? - GS

A DB2 utility used to collect statistics about the data values in tables which can be used by the optimizer to decide the access path. These statistics are stored in DB2 catalog tables and is critical in determining accesspaths for a SQL

29. When will you chose to run RUNSTATS?

After a load, or after mass updates, inserts, deletes, or after REORG. And Periodically

30. Give some example of statistics collected during RUNSTATS?

Col Count – Number of unique values in a column (if high index access is used), Number of columns populated.

31. In SPUFI suppose you want to select max. of 1000 rows , but the select returns only 200 rows. What are the 2 sqlcodes that are returned? - GS

100 (for successful completion of the query), 0 (for successful COMMIT if AUTOCOMMIT is set to Yes).

32. How would you print the output of an SQL statement from SPUFI? - GS

Print the output dataset.

33. How do you pull up a query which was previously saved in QMF ? - GS

34. How do you select a row using indexes? - GS

Specify the indexed columns in the WHERE clause.

35. Lot of updates have been done ona table due to which indexes have gone haywire.

What do you do? – GS

Reorg

36. What are split indexes? (exact question is not known) GS

Ramesh, I think they were talking about what do you do if index splits occur due to mass inserts/updates. I think the answer is a REORG is required.

37. What happens when you say OPEN CURSOR?

If there is an ORDER BY clause, rows are fetched, sorted and made available for the FETCH statement. Other wise simply the cursor is placed on the first row.

In case of Open Cursor

If Cursor statement is complex (i.e. multiple tables accessed, access path use multiple indexes etc.) than materialization happens and a temporary table is created.

In other case cursor is simply placed on first row depending on Order By clause

38. Is DECLARE CURSOR executable?

No.

39. Can you have more than one cursor open at any one time in a program ? - GS

Yes.

40. How would you find out the total number of rows in a table? - GS

Use SELECT COUNT(*) ...

41. How do you eliminate duplicate values in SELECT? - GS

Use SELECT DISTINCT ...

42. How do you find the maximum value in a column? - GS

Use SELECT MAX(...

43. What does the sqlcode of -818 pertain to? - GS

This is generated when the consistency tokens in the DBRM and the load module are different.

44. What is UNION, UNION ALL? - GS

UNION : eliminates duplicates

UNION ALL: retains duplicates

Both these are used to combine the results of different SELECT statements.

45. Suppose I have five SQL SELECT statements connected by UNION/UNION ALL, how many times should I specify UNION to eliminate the duplicate rows? - GS

Once.

46. What is dynamic SQL? - GS

Dynamic SQL is a SQL statement created at program execution time.

47. What else is there in the PLAN apart from the access path? - GS

PLAN has the executable code for the SQL statements in the host program

48. When is the access path determined for dynamic SQL? - GS

At run time, when the PREPARE statement is issued.

49. Suppose I have a program which uses a dynamic SQL and it has been performing well till now. Off late, I find that the performance has deteriorated. What happened? - GS

Probably RUN STATS is not done and the program is using a wrong index due to incorrect stats.

Probably RUNSTATS is done and optimizer has chosen a wrong access path based on the latest statistics.

50. Apart from cursor, what other ways are available to you to retrieve a row from a table in embedded SQL? - GS

Single row SELECTs.

51. How do you retrieve the data from a nullable column? - GS

Use null indicators. Syntax INTO :HOSTVAR:NULLIND

52. What is the picture clause of the null indicator variable? - GS
S9(4) COMP.

53. What does it mean if the null indicator has -1, 0, -2

-1 : the field is null
0 : the field is not null
-2 : the field value is truncated

54. How do you insert a record with a nullable column?

To insert a NULL, move -1 to the null indicator
 To insert a valid value, move 0 to the null indicator

55. Some questions on concatenate, substring features of DB2. - GS

56. What is IMAGECOPY ? - GS

It is full backup of a DB2 table which can be used in recovery.

57. When do you use the IMAGECOPY? - GS

To take routine backup of tables
 After a LOAD with LOG NO

58. What is a clustering index ? - GS

A mandatory index defined on a partitioned table space. Causes the data rows to be stored in the order specified in the index. Obviously a table can have only one clustering index.

59. What are correlated subqueries? - GS

One in which the lower level nested select refers back to the table in the higher level.

60. What are the issues related with correlated subqueries? - GS

61. What is sqlcode -922 ?

62. What is sqlcode -811?

63. What is a DBRM, PLAN ?

DBRM: DataBase Request Module, has the SQL statements extracted from the host language program by the SQL precompile.

PLAN: A result of the BIND process. It has the executable code for the SQL statements in the DBRM.

64. What happens to the PLAN if index used by it is dropped?

Plan is marked as invalid. The next time the plan is invoked, it is recreated.

65. What is the difference between primary key & unique index ?

66. What is QUIESCE?

A QUIESCE flushes all DB2 buffers on to the disk. This gives a correct snapshot of the database and should be used before any IMAGECOPY to maintain consistency.

67. Are views updatable ?

Not all of them. Some views are updatable e.g. single table view with all the fields or mandatory fields. Examples of non-updatable views are views which are joins, views that contain aggregate functions(such as MIN).

68. If I have a view which is a join of two or more tables, can this view be updatable? - GS

No.

69. What is a synonym ?

Synonym is an alternate name for a table or view. A synonym is accessible only by the creator.

70. What is FREEPAGE and PCTFREE in TABLESPACE creation?

PCTFREE: percentage of each page to be left free

FREEPAGE: Number of pages to be loaded with data between each free page

71. What is CHECK PENDING ?

Pend status of table space to check for different values. Usual before load TS is pended in four different pend status. After load a image copy job is run which will eliminate these pend statuses

72. What are the 4 environments which can access DB2 ?

TSO, CICS, IMS and BATCH

73. What is outer join ?

Outer join is one in which you want both matching and non matching rows to be returned. DB2 has no specific operator for outer joins, it can be simulated by combining a join and a correlated sub query with a UNION.

74. What are simple, segmented and partitioned table spaces ?

Simple Tablespace:

Can contain one or more tables

Rows from multiple tables can be interleaved on a page under the DBAs control and maintenance

Segmented Tablespace:

Can contain one or more tables

Tablespace is divided into segments of 4 to 64 pages in increments of 4 pages.

Each segment is dedicated to single table. A table can occupy multiple segments

Partitioned Tablespace:

Can contain one table

Tablespace is divided into parts and each part is put in a separate VSAM dataset.

75. How is a typical DB2 batch pgm executed ?

Use DSN utility to run a DB2 batch program. An example is shown:

```
DSN SYSTEM(DSP3)
  RUN PROGRAM(EDD470BD) PLAN(EDD470BD)
LIB('EDGS01T.OBJ.LOADLIB')
END
```

Use IKJEFT01 utility program to run this command in a JCL.

76. Assuming that a site's standard is that pgm name = plan name, what is the easiest way to find out which pgms are affected by change in a table's structure ?

Query the catalogue table SYSPLANDEP.

77. Name some fields from SQLCA.

SQLCODE, SQLERRM, SQLERRD ...

78. When do you specify the isolation level? How?

During the BIND process. ISOLATION (CS/RR)...

79. How can you quickly find out the # of rows updated after a mass update statement?

Check the value stored in SQLERRD(3).

80. Consider the employee table with column PROJECT nullable. How can you get a list of employees who are not assigned to any project?

```
SELECT EMPNO
FROM EMP
WHERE PROJECT IS NULL;
```

81. Why SELECT * is not preferred in embedded SQL programs?

For three reasons:

- If the table structure is changed (a field is added), the program will have to be modified
- Program might retrieve the columns which it might not use, leading on I/O over head.

- The chance of an index only scan is lost.

82. What is filter factor?

Number of distinct col values/Number of rows in the table

83. What is index cardinality? - GS

84. What are the various locking levels available?

PAGE, TABLE, TABLESPACE

Subpage, row level with type2 indexes

85. How does DB2 determine what locking level to use?

Type of indexes, Bind

86. What are the disadvantages of PAGE level lock?

Concurrency is limited

87. What is lock escalation?

Lock moved from a subpage to page or page to tablespace

88. What are the various locks available?

SHARE, EXCLUSIVE, UPDATE

89. What is the difference between CS and RR isolation levels?

CS: Releases the lock on a page after use

RR: Retains all locks acquired till end of transaction

90. Can I use LOCK TABLE on a view?

No. To lock a view, take lock on the underlying tables.

91. What are COLLECTIONS?

Prefixes for a package name. Makes it convenient to use in PKLIST for plans.

92. When you COMMIT, is the cursor closed?

Yes.

93. How do you leave the cursor open after issuing a COMMIT? (for DB2 2.3 or above only)

Use WITH HOLD option in DECLARE CURSOR statement. Has no effect in CICS. I believe CICS will retain posn after a SYNCPOINT???

In pseudoconversation CURSOR with HOLD also gets closed

94. Give the COBOL definition of a VARCHAR field.

95. What is the physical storage length of each of the following DB2 data types:

DATE, TIME, TIMESTAMP?

DATE: 4bytes
 TIME: 3bytes
 TIMESTAMP: 10bytes

96. What is the COBOL picture clause of the following DB2 data types:
 DATE, TIME, TIMESTAMP?

DATE: PIC X(10)
 TIME : PIC X(08)
 TIMESTAMP: PIC X(26)
 97. What is the result of this query if no rows are selected:
 SELECT SUM(SALARY)
 FROM EMP
 WHERE QUAL='MSC';

NULL

98. What is the difference between SYNONYM and ALIAS?

SYNONYM: is dropped when the table or tablespace is dropped. Synonym is available only to the creator.

ALIAS: is retained even if table or tablespace is dropped. ALIAS can be created even if the table does not exist. It is used mainly in distributed environment to hide the location info from programs. Alias is a global object & is available to all.

99. My SQL statement SELECT AVG(SALARY) FROM EMP yields inaccurate results. Why?

Because SALARY is not declared to have NULLs and the employees for whom the salary is not known are also counted.

100. How do you retrieve the first 5 characters of FIRSTNAME column of EMP table?

SELECT SUBSTR(FIRSTNAME,1,5) FROM EMP;

101. How do you concatenate the FIRSTNAME and LASTNAME from EMP table to give a complete name?

SELECT FIRSTNAME || ' ' || LASTNAME FROM EMP;

102. What is the use of VALUE function?

Avoid handling NULLable fields. It assigns a default of 0 to numeric fields which are NULL.

103. What do you mean by NOT NULL WITH DEFAULT? When will you use it?

In insert if column is not specified than default value is taken

104.What do you mean by NOT NULL? When will you use it?

Column needs to have some value specified.

105.What are aggregate functions?

Max, Sum, Avg

106.What is REORG? When is it used?

107.How do I create a table MANAGER (EMP#, MANAGER) where MANAGER is a foreign key which references to EMP# in the same table? Give the exact DDL.

108.Will precompile of an DB2-COBOL program bomb, if DB2 is down?

No. Because the precompiler does not refer to the DB2 catalogue tables.

109.Can you use MAX on a CHAR column?

YES.

110.What is the restriction on using UNION in embedded SQL?

It has to be in a CURSOR.

111.When does the authorization check on DB2 objects is done - at BIND time or run time?

Both, there is bind authority and execution authority

112.What is COPY PENDING status?

A state in which, an image copy on a table needs to be taken, In this status, the table is available only for queries. You cannot update this table. To remove the COPY PENDING status, you take an image copy or use REPAIR utility.

113.How many clustering indexes can be defined for a table?

Only one.

114.How does DB2 store NULL physically?

High Values

115.When would you prefer to use VARCHAR?

116.What are the disadvantages of using VARCHAR?

117.What happens to the plans when an index used by them is dropped?

Marked as invalid

118.What is auditing?

Logging updates

119.What is ACQUIRE/RELEASE in BIND?

When to release the lock at commit or task termination point.

JCL-FAQs

1. What is primary allocation for a dataset?

The space allocated when the dataset is first created.

2. What is the difference between primary and secondary allocations for a dataset?

Secondary allocation is done when more space is required than what has already been allocated.

3. How many extents are possible for a sequential file ? For a VSAM file ?

16 extents on a volume for a sequential file and 123 for a VSAM file.

4. What does a disposition of (NEW,CATLG,DELETE) mean? - GS

That this is a new dataset and needs to be allocated, to CATLG the dataset if the step is successful and to delete the dataset if the step abends.

5. What does a disposition of (NEW,CATLG,KEEP) mean? - GS

That this is a new dataset and needs to be allocated, to CATLG the dataset if the step is successful and to KEEP but not CATLG the dataset if the step abends. Thus if the step abends, the dataset would not be catalogued and we would need to supply the vol. ser the next time we refer to it.

6. How do you access a file that had a disposition of KEEP? - GS

Need to supply volume serial no. VOL=SER=xxxx.

7. What does a disposition of (MOD,DELETE,DELETE) mean ?

The MOD will cause the dataset to be created (if it does not exist), and then the two DELETES will cause the dataset to be deleted whether the step abends or not. This disposition is used to clear out a dataset at the beginning of a job.

8. What is the DD statement for a output file?

Unless allocated earlier, will have the foll parameters:
DISP=(NEW,CATLG,DELETE), UNIT , SPACE & DCB .

9. What do you do if you do not want to keep all the space allocated to a dataset? - GS

Specify the parameter RLSE (release) in the SPACE e.g.
SPACE=(CYL,(50,50),RLSE)

10. What is DISP=(NEW,PASS,DELETE)?

This is a new file and create it, if the step terminates normally, pass it to the subsequent steps and if step abends, delete it. This dataset will not exist beyond the JCL.

11. How do you create a temporary dataset? Where will you use them?

Temporary datasets can be created either by not specifying any DSNAME or by specifying the temporary file indicator as in DSN=**TEMP.

We use them to carry the output of one step to another step in the same job. The dataset will not be retained once the job completes.

12. How do you restart a proc from a particular step? - GS

In job card, specify RESTART= procstep.stepname
where procstep = name of the jcl step that invoked the proc
and stepname = name of the proc step where you want execution to start

13. How do you skip a particular step in a proc/JOB? - GS

Can use either condition codes or use the jcl control statement IF (only in ESA JCL)

14. A PROC has five steps. Step 3 has a condition code. How can you override/nullify this condition code? - GS

Provide the override on the EXEC stmt in the JCL as follows:

```
//STEP001 EXEC procname,COND.stepname=value
```

All parameters on an EXEC stmt in the proc such as COND, PARM have to be overridden like this.

15. How do you override a specific DDNAME/SYSIN in PROC from a JCL?

```
//<stepname.dd> DSN=...
```

16. What is NOTCAT 2 - GS

This is an MVS message indicating that a duplicate catalog entry exists. E.g., if you already have a dataset with dsn = 'xxxx.yyyy' and u try to create one with disp new,catlg, you would get this error. the program open and write would go through and at the end of the step the system would try to put it in the system catalog. at this point since an entry already exists the catlg would fail and give this message. you can fix the problem by deleting/uncataloging the first data set and going to the volume where the new dataset exists(this info is in the msglog of the job) and cataloging it.

17. What is 'S0C7' abend? - GS

Caused by invalid data in a numeric field.

18. What is a S0C4 error ? - GS

Storage violation error - can be due to various reasons. e.g.: READING a file that is not open, invalid address referenced due to subscript error.

19. What are SD37, SB37, SE37 abends?

All indicate dataset out of space. SD37 - no secondary allocation was specified. SB37 - end of vol. and no further volumes specified. SE37 - Max. of 16 extents already allocated.

20. What is S322 abend ?

Indicates a time out abend. Your program has taken more CPU time than the default limit for the job class. Could indicate an infinite loop.

21. Why do you want to specify the REGION parameter in a JCL step? - GS

To override the REGION defined at the JOB card level.
REGION specifies the max region size. REGION=0K or 0M or omitting REGION means no limit will be applied.

22. What does the TIME parameter signify ? What does TIME=1440 mean ?

TIME parameter can be used to overcome S322 abends for programs that genuinely need more CPU time. TIME=1440 means no CPU time limit is to be applied to this step.

23. What is COND=EVEN ?

Means execute this step even if any of the previous steps, terminated abnormally.

24. What is COND=ONLY ?

Means execute this step only if any of the previous steps, terminated abnormally.

25. How do you check the syntax of a JCL without running it?

TYPERUN=SCAN on the JOB card or use JSCAN.

26. What does IEBGENER do?

Used to copy one QSAM file to another. Source dataset should be described using SYSUT1 ddname. Destination dataset should be described using SYSUT2. IEBGENER can also do some reformatting of data by supplying control cards via SYSIN.

27. How do you send the output of a COBOL program to a member of a PDS?

Code the DSN as pds(member) with a DISP of SHR. The disp applies to the pds and not to a specific member.

28. I have multiple jobs (JCLs with several JOB cards) in a member. What happens if I submit it?

Multiple jobs are submitted (as many jobs as the number of JOB cards).

29. I have a COBOL program that ACCEPTs some input data. How do you code the JCL statment for this? (How do you code instream data in a JCL?)

```
//SYSIN DD*
input data
input data
/*
```

30. Can you code instream data in a PROC ?

No.

31. How do you overcome this limitation ?

One way is to code SYSIN DD DUMMY in the PROC, and then override this from the JCL with instream data.

32. How do you run a COBOL batch program from a JCL? How do you run a COBOL/DB2 program?

To run a non DB2 program,
//STEP001 EXEC PGM=MYPROG

To run a DB2 program,
//STEP001 EXEC PGM=IKJEFT01
//SYSTSIN DD *
DSN SYSTEM(....)
RUN PROGRAM(MYPROG)
PLAN(.....) LIB(....) PARMS(...)
/*

33. What is STEPLIB, JOBLIB? What is it used for? - GS

Specifies that the private library (or libraries) specified should be searched before the default system libraries in order to locate a program to be executed.

STEPLIB applies only to the particular step, JOBLIB to all steps in the job.

34. What is order of searching of the libraries in a JCL? - GS

First any private libraries as specified in the STEPLIB or JOBLIB, then the system libraries such as SYS1.LINKLIB. The system libraries are specified in the linklist.

35. What happens if both JOBLIB & STEPLIB is specified ?

JOBLIB is ignored.

36. When you specify multiple datasets in a JOBLIB or STEPLIB, what factor determines the order? - GS

The library with the largest block size should be the first one.

37. How to change default proclib ?

```
//ABCD JCLLIB ORDER=(ME.MYPROCLIB,SYS1.PROCLIB)
```

38. The disp in the JCL is MOD and the program opens the file in OUTPUT mode. What happens ? The disp in the JCL is SHR and the pgm opens the file in EXTEND mode. What happens ?

Records will be written to end of file (append) when a WRITE is done in both cases.

39. What are the valid DSORG values ?

PS - QSAM, PO - Partitioned, IS - ISAM

40. What are the differences between JES2 & JES3 ?

JES3 allocates datasets for all the steps before the job is scheduled. In JES2, allocation of datasets required by a step are done only just before the step executes.

CICS-FAQs

1. How do you place the cursor on a particular position on the screen? - GS
Move -1 to the length attribute of the field and use the CURSOR option.
Define the field with IC in the BMS map.
2. What are the two outputs created as a result of generation of a map? - GS
The map copybook and the load module.
3. What is the difference between physical map and symbolic map? - GS
The physical map is the load module and the symbolic map is the data structure.
4. How do you protect a field from being overlaid? - GS

5. What is the attribute byte? - GS
Defines the display/transmission of field. most cases is an output field from the program.
6. What are the 3 working storage fields used for every field on the map? - GS
Length, attribute and input/output field.
7. How is dynamic memory allocated within a CICS application program? - GS
Use a GETMAIN
8. What are the restrictions while using GETMAIN and FREEMAIN? - GS
9. How are VSAM files Read in CICS pgms? - GS
File Control Commands. Random, Sequential, forward and backward.
10. When you compile a CICS program, the (pre)compiler puts an extra chunk of code. Where does it get included and that is it called? What is its length? - GS
DFHEIBLK, DFHCOMMAREA.
11. List all the CICS tables and explain their contents. - GS

PPT	SIT
PCT	JCT
FCT	SNT
DCT	SRT
RCT	TCT
12. I have written a CICS program. What tables should I setup to run this program? - GS
PPT, PCT, (FCT, DCT, RCT (if needed)).
13. In which table would you make an entry for a BMS map? - GS
PPT
14. What is the content of the PPT entry? - GS
Length, Source, Use count, Lang, Res count DFHRPL number
15. For a CICS-DB2 program, how is the plan referenced? - GS
Uses a RCT table.
16. What is the use of a TDQ, TSQ? - GS
Temporary data stores.
17. How do you read from a TSQ? - GS
Temp storage read command

-
18. If I create a TSQ from one transaction, can I read it from another transaction? - GS
Yes. As long as they run in the same region.
19. Can you issue SQL COMMIT from a CICS program? - GS
No.
20. What is the other way of terminating a transaction? - GS
EXEC CICS SYNCPOINT. Assuming it is a LUW. This will not end the Xn.
21. What is an ASRA abend ?
Any data exception, problem SOC7, SOC4 etc.
22. What is an AEY9 abend ?
DB2/IDMS not up.
23. What are the situations under which NEWCOPY is required ?
When a program has been used in CICS atleast once and then changed and recompiled.
24. What is 2 phase commit?
Simultaneous Syncpoint for two different DB for ex VSAM and DB2 updates
25. What are extra partition & intra partition TDQs?
Extra partition TDQs are datasets used for communication b'n CICS and other CICS/Batch regions. Intrapartition TDQs are queues for communication within regn.
26. What is trigger level in the context of TDQs?
For intrapartition TDQs specify the # records at which ATI happens. not applicable for extra partition TDQs.
27. What is ENQ, DEQ ?
Task control commands to make resources serially reusable.
28. What is MDT? What are FSET, FRSET ?
Modified Data Tag. Bit in the attribute byte indicating modification of field on screen.
Happens on an input operation.
FSET. Sets MDT on to ensure field is transmitted. Happens on an output operation.
FRSET. Resets MDT. Until this happens, field continues to be sent.
29. What is EXEC CICS RETRIEVE ?
Used by STARTed tasks to get the parameters passed to them.
30. What do you do if you do not want characters entered by the user to be folded to uppercase ?
Use ASIS option on RECEIVE.

31. What does the BUFFER option in RECEIVE mean ?
Brings the entire datastream from the terminal buffer.
32. What are SEND MAP MAPONLY & SEND MAP DATAONLY ?
33. What is the difference between a PF key & a PA key ?
PF keys wake up the task and transmit modified data, PA keys only wake up the task.
34. Name some important fields in the EIB block ?
EIBRESP, EIBCALEN, EIBRRCDE, EIBTASK, EIBDATE, EIBTIME
35. Can you use DYNAMIC calls in CICS ?

Yes, the called routine must be defined in PPT and the calling program must use CALL identifier..
36. How do you handle errors in CICS pgms ?
Check EIBRESP after the call or use the HANDLE condition.
37. How do you use extended attributes ?
Define EXTATT=YES and the correct terminal type.
38. Suppose pgm A passes 30 bytes to pgm B thru commarea and pgm B has defined its DFHCOMMAREA to be 50 bytes . Is there a problem ?
Yes, if B tries to access bytes 31-50.
39. When an XCTL is done, does the tranid change ? Is a new task created ? Does it cause an implicit SYNCPOINT to be issued ?
No, No, Yes.
40. How do you execute a background CICS txn ?
With a START or ATI.
41. How do you fire a batch job from a CICS txn ?
Define an extrapartition TDQ as an internal reader and write the JCL to it. Terminate the JCL with /*EOF.
42. Can a CICS region be attached to more than one DB2 subsystem ?
no and yes. You can access objects of other db2 subsystems by defining alias. However explicit access to remote db2 subsystem object is not possible
43. What determines the DB2 subsystem to which a particular CICS region is attached ?
RCT
44. What is the DSN transaction used for ?
for establishing link between cics and db2

45. What is the use of DSECT parameter in BMS?
Is the parameter to generate a symbolic map.
46. Do you receive the attribute byte in the symbolic map?
On EOF yes.
47. How do you make your BMS maps case sensitive?
Use ASIS???
48. What is effect on RECEIVE MAP when
- PF key is pressed? Data transmission may happen,
 - PA key is pressed? Data transmission will not happen.
49. What is the use of DCT?
Destination Control Table used to define TDQs
50. How do you handle error in a CICS program?
Same as 36.
51. Name the macros used to define the following:
- | | | |
|--------|--------|--------|
| MAP | MAPSET | FIELD |
| DFHMSD | DFHMDI | DFHMDF |
52. Can you use OCCURS in a BMS map? If you do, what are the issues related with its use?
Yes. cannot use group by clause???
53. What is the meaning of BMS length of field = 0?
Data was not entered in the field
54. Can you simply check if length = 0 for checking if a field was modified?
No, not if ERASE EOF was used.
55. What is ATI? What kind of TDQ can be used?
Automatic Task Initiation. Intra partition TDQ.
56. Do you require a table entry for a TSQ?
If recovery is needed.
57. Is there any entry for TSQs in CICS tables?
Yes in the DFHTST.
58. What is the difference between START and XCTL ?
START is used to start a new task. It is a interval control command. XCTL is used to pass control to a program within the same task. It is a program control command.

59. Can you define multiple maps in a BMS mapset?
Yes.
60. How is the storage determined in the symbolic map, if you have multiple maps?
Storage for maps redefine the first. This means largest map has to be the first.
61. What is the usage of language in the PPT entry?
Language interface and call parameters???
62. Can you have CICS code in a copybook? If yes, what happens during compilation?
Yes. Needs to be preprocessed.
63. What is an AICAabend?
Runaway Task.
64. How would you resolve an ASRAabend?
In COBOL II start with CEBR, and get the offset/instruction.
65. What are the steps you go through to create a BMS executable?
Assemble to create CSECT and Link
66. How will you access a VSAM file using an alternate index?
Thru the path. Define path as an FCT and use normal File control commands.
67. I have TSQ with 15 items. I want to delete the 10th item. How do I do that?
68. How do you rollback data written to an ESDS file?
Define the file as recoverable. in cases where records have been inserted into the file, you may need to run a batch program to logically delete the inserted records.
69. I invoke a transaction from CICS. The program has a code: MOVE DFHCOMMAREA TO WS-AREA. What happens to this transaction? What happens to the other transactions?
Junk may get moved in. Will cause Storage violation. ????
70. When you do a START, what will the value of EIBCALEN?
Zero.
71. I have done a START BROWSE on a VSAM dataset. Can I do another START BROWSE without doing an END BROWSE?
No.
72. How do I find the name of the CICS region inside my COBOL program?
73. Can you access QSAM (seq) files from CICS ?
No.

Can you access ESDS files from CICS ?

Yes.

VSAM-FAQs

1. What are the different types of VSAM files available?

ESDS: Entry Sequence Data Set

KSDS: Key Sequence Data Set

RRDS: Relative Data Set

2. What is IDCAMS ?

IDCAMS is the Access Method Services program. You run the IDCAMS program and supply AMS commands thru SYSIN. (examples of AMS commands are DELETE, DEFINE, REPRO etc..).

3. Can AMS commands be run from the TSO prompt ?

Yes

4. Syntax of AMS modal commands ?

Note: these can be used only under IDCAMS and not from the TSO prompt.

IF LASTCC(or MAXCC) >(or < , = etc..) value -

THEN -

DO -

command set (such as DELETE, DEFINE etc..)

ELSE -

DO -

command set

LASTCC - Condition code from the last function(such as delete) executed

MAXCC - Max condition code that was returned by any of the prev functions

SET is also a valid AMS command. SET LASTCC (or MAXCC) = value

The maximum condition code is 16. A cond code of 4 indicates a warning. A cond code of 8 is usually encountered on a DELETE of a dataset that is not present.

5. Under IDCAMS , multiple functions can be executed, each of which returns a cond code. What will be the condition code returned to the operating system ?

The maximum condition code generated is returned as the condition code of the IDCAMS step.

6. What is Control Interval, Control Area

Control Interval is analogous to a physical block for QSAM files. It is the unit of i/o. Must be between 512 bytes to 32 k. Usually either 2K or 4K. A larger control interval increases performance for sequential processing while the reverse is true for random access. Under CICS when a record is locked, the entire CI gets locked.

Control area is a group of control intervals. CA is used during allocation. CA size is calculated based on the allocation type (cyl, tracks or records) and can be max of 1 cylinder

7. What is FREESPACE ?

Coded in the DEFINE as FREESPACE(ci ca) where ci is the percentage of each control interval to be left free for insertions, ca is the percentage of control intervals in each control area to be left empty.

8. How do you decide on optimum values for CI, FREESPACE etc...

CI size should be based on record length, type of processing. Usually CI is 4K. If record length is larger(>1K), chose 6K or 8K.

FREESPACE should be large if more number of insertions are envisaged. Usual values are (20 20) when heavy updates are expected. CI size can be calculated.

9. Would you specify FREESPACE for an ESDS?

No. Because you cannot insert records in an ESDS, also when you rewrite a record, it must be of the same length. Thus putting any value for freespace does not make any sense.

10. What is SHAREOPTS ?

SHAREOPTS is a parameter in the DEFINE and specifies how an object can be shared among users. It is coded as SHAREOPTS(a b), where a is the cross region share option ie how two or more jobs on a single system can share the file, while b is the cross system share option ie how two or more jobs on different MVSES can share the file. Usual value is (2 3).

11. What is the meaning of each of the values in SHAREOPTS(2 3)?

Value of 2 for cross region means that the file can be processed simultaneously by multiple users provided only one of them is an updater. Value of 3 for cross system means that any number of jobs can process the file for input or output (VSAM does nothing to ensure integrity).

12. How do you define a KSDS ?

DEFINE CLUSTER(cluster name) with the INDEXED parameter. Also specify the ds name for the DATA component & the ds INDEX component. Other important parms are RECORDSIZE, KEYS, SHAREOPTIONS.

13. How do you define an ALTINDEX ? How do you use ALTINDEXs in batch, CICS pgms ?

DEFINE ALTERNATEINDEX. Important parameters are RELATE where you specify the base cluster name, KEYS, RECORDSIZE, SHAREOPTIONS, UNIQUEKEY (or NONUNIQUEKEY), DATA(ds name for the data component), INDEX(ds name for the index component).

Then DEFINE PATH. Important parameters are NAME (ds name for the path), PATHENTRY (ds name of the alternate index name), UPDATE (or NOUPDATE) which specifies whether an alt index is updated when a update to the base cluster takes place.

Then BLDINDEX. Parameters are INDATASET(ds name of base cluster), OUTDATASET(ds name of AIX).

Using alternate indexes in batch pgms:

In the JCL, you must have DD stmts for the cluster and for the path(s). In the cobol pgm, SELECT .. ASSIGN TO ddname for base cluster RECORD KEY IS... ALTERNATE RECORD KEY IS..

Using alternate indexes in CICS pgms:

FCT entries must be created for both base cluster & the path. To read using the alternate index, use the dd name of the path in CICS file control commands.

14. What happens when you open an empty VSAM file in a COBOL program for input?

A VSAM file that has never contained a record is treated as unavailable. Attempting to open for input will fail. An empty file can be opened for output only. When you open for output, COBOL will write a dummy record to the file & then delete it out.

15. How do you initialize a VSAM file before any operation? a VSAM with alternate index?

Can write a dummy program that just opens the file for output & then closes it.

16. What does a file status of 02 on a VSAM indicate?

Duplicate alternate key . Happens on both input and output operation

17. How do you calculate record size of an alternate cluster? Give your values for both unique and non-unique.

Unique Case: $5 + (\text{alt-key-length} + \text{primary-key})$

Nonunique Case: $5 + (\text{alt-key-length} + n * \text{primary-key})$

where $n = \#$ of duplicate records for the alternate key

???? Ramesh - can you explain ?

18. What is the difference between sequential files and ESDS files?

Sequential(QSAM) files can be created on tape while ESDS files cannot.

Also, you can have ALTINDEX for an ESDS while no such facility exists for QSAM files.

19. How do you load a VSAM data set with records ?

Using the REPRO command.

20. How do you define a GDG ?

Use the DEFINE GENERATIONDATAGROUP command. In the same IDCAMS step, another dataset must be defined whose DCB parameters are used when new generations of the GDG are created. This dataset is known as the model dataset. The ds name of this model dataset must be the same as that of the GDG, so use a disp of keep rather than catlg and also specify space=(trk,0)

21. Do all versions of the GDG have to be of the same record length ?

No, the DCB of the model dataset can be overridden when you allocate new versions.

22. How are different versions of GDG named ?

base-file-name.GnnnnnV00 where nnnn= generation number (upto 255).
nnnn will be 0000 for the 1st generation.

23. Suppose 3 generations of a GDG exist. How would you reference the 1 st generation in the JCL? - GS

Use GDG name(-2).

24. Suppose a generation of GDG gets created in a particular step of a proc. How would you refer the current generation in a subsequent step? What would be the disposition of this generation now? - GS

Relative generation numbers are updated only at the end of the job, not at the end of a step. To allocate a new generation, we would be using (+1) with a DISP of (NEW,CATLG,DELETE). To refer to this in a subsequent step in the same job, we would again use (+1) but with a DISP of SHR or OLD.

25. What more info you should give in the DD statement while defining the next generation of a GDG? - GS

Give (+1) as the generation number, give (new,catlg) for disp, give space parameter, can give the dcb parameter if you want to override the dcb of the model dataset.

26. Assuming that the DEFINE jcl is not available, how do you get info about a VSAM file's organisation ?

Use the LISTCAT command.

27. During processing of a VSAM file, some system error occurs and it is subsequently unusable . What do you do ?

Run VERIFY.

54. What is SSRANGE, NOSSRANGE ?

These are compiler options w.r.t subscript out of range checking. NOSSRANGE is the default and if chosen, no run time error will be flagged if your index or subscript goes out of the permissible range.

55. How do you set a return code to the JCL from a COBOL program?

Move a value to RETURN-CODE register. RETURN-CODE should not be declared in your program.

56. How can you submit a job from COBOL programs?

Write JCL cards to a dataset with
//xxxxxxx SYSOUT=(A,INTRDR) where 'A' is output class, and dataset should be opened for output in the program. Define a 80 byte record layout for the file.

57. What are the differences between OS VS COBOL and VS COBOL II?

OS/VS Cobol pgms can only run in 24 bit addressing mode, VS Cobol II pgms can run either in 24 bit or 31 bit addressing modes.

Report writer is supported only in OS/VS Cobol.

USAGE IS POINTER is supported only in VS COBOL II.

Reference modification eg: WS-VAR(1:2) is supported only in VS COBOL II.

EVALUATE is supported only in VS COBOL II.

Scope terminators are supported only in VS COBOL II.

OS/VS Cobol follows ANSI 74 stds while VS COBOL II follows ANSI 85 stds.

Under CICS Calls between VS COBOL II programs are supported.

58. What are the steps you go through while creating a COBOL program executable?

DB2 precompiler(if embedded sql used), CICS translator (if CICS pgm), Cobol compiler, Link editor.

If DB2 program, create plan by binding the DBRMs.

59. Can you call an OS VS COBOL pgm from a VS COBOL II pgm ?

In non-CICS environment, it is possible. In CICS, this is not possible.

