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A<sub>1</sub> - what is eclipse = eclipse is an integrated development environment used in programming languages or it is an application which is used to develop Java

A<sub>2</sub> = where is package explorer and what is the use?

A<sub>2</sub> = package explore is in left side of eclipse, and it holds projects, packages, and classes.

B = where is code editor and what do you use it for?

A<sub>3</sub> = code Editor is mostly in the middle of the eclipse page, we are using it a lot, like when we write our codes, Edit codes generally any operation we are doing to the codes are inside code Editor.

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Q2 = what is console, where and when do you see it?

A2 = console is a window, we can locate it anywhere in eclipse but most of the time place in bottom of eclipse, and it shows the return of our codes, when we print out our codes we can see console.

Q2 Explain below Keyboard shortcuts and give examples of how they can help?

a =  $\text{ctrl} + \text{d}$  = deletes current line in the Editor.

b =  $\text{ctrl} + \text{shift} + \text{F}$  = format the codes.

c =  $\text{ALT} + \text{shift} + \text{r}$  = refactor variables.

d =  $\text{ctrl} + \text{space}$  = get suggestion for our code.

e =  $\text{ctrl} + \text{c}$  = it <sup>take</sup> copy of codes, text, any context.

f =  $\text{ctrl} + \text{x}$  = it cut codes or any context.

g =  $\text{ctrl} + \text{v}$  = it paste the codes or text you took copy of that.

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Q3 = What is main method? When do you use it?  
What if you don't have it? Explain.

A3 = Main method is a very important method  
in Java. It includes access modifier, return type,  
data type, and we use it when we want to  
execute our codes, if we don't have it we  
are not able to execute our codes.

Question 4: What is keyword/Reserved word in  
Java? Explain and list examples.

Answer 4: Keyword/Reserved word/pre-defined word  
we can not use them as name in ~~java~~ or  
classes, package or projects. Their purpose  
are pre-defined, keyword are almost (57)  
like static, void, extends, implements and so on,  
we can use base on purpose which are created  
already.

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Question 5 = what is pseudocode? Have you ever used it? How does it help? Explain.

Answer 5: Pseudocode is informal code or guide which designed to explain us how to write our code, I have used a lot when I am writing codes, it helps me to find a solution for complex examples.

Question 6: What is JDK?

Answer 6: Java Development Kit is a software development environment, which provide collection of tools and libraries for developing an application anything we write in JDK called Source code / High level code.

Question 7: What is JVM?

Answer 7: Is an engine which converts the byte code to engine language / binary.

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Question 8: what is compiler?

Answer 8: a translator which convert the source code to the byte code.

Question 9: How many flow of control do we have in Java? Explain each with example code

Answer 9: we have four types of control

Flow:

1 Sequential execution is reading from top to bottom and from left to right.

ex= int x = 5; int y = 10; int z = x + y;

2 method call is type control flow which we can create a method first and call that method by writing the name of method.

ex= public double gessomne double a, doubles  
{ double res = a + b; return res; }

3 selection=selection java will select the right condition and will print it out.

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example of selection

```
int a= 5; if(a>b){System.out.println("a");}  
int b= 10;  
} else{System.out.println("b");}
```

4- looping/iterations = looping is using for printing a range of number-

```
ex: int a= 0;  
while(a < 10){System.out.println(a);  
a+=2;}
```

Question 10: What types of program error do we have in java? explain each with example code.

Answer 10: we have three types program error in java.

1 compiler errors = in compiler errors syntax is wrong and won't run at all.

```
ex = int y= "I am Techschool student";
```

2 Runtime errors = it didicates by Jvm and happens during runtime

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also runtime error is mathematical error

ex: int x=5! int y=0! int z=x/y!

3: logical errors: it happens when we chose wrong operators and we will get unexpected result.

ex: int x=7! int y=2! int multiplication =  
x/y!

Question 11: when we talk about components of code in java what do we mean by statement? explain with code example.

Answer 11: statement specify an action and it is used to declare and initialize a variable, also we can say one line of code statement.

ex: System.out.println((a+b)? ++a : ++b)!

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Question 12: what is code block? explain with examples of code.

Answer 12: Code block is multiple line of code which is inclosed by curly braces.  
ex: `public void setAddress(string Adress) {  
 this.Adress = Adress; }`

Question 13: How do we comment in java?

what is the use of commenting? How many types of commenting do we have? Explain with examples.

if we have one line code we can comment it by two of slash (//).

if we want to comment multiple line of code we use at the begining of first line slash with Asterisk /\*) and we write Asterisk with slash at the end of last line (\*/).

Q

commenting is use for preventing from execution of codes also somehow use to explain the codes.

We have two types of commenting

1 single comment.

2 block comment or multiple comments.

Question 14: Does the whitespace that we have in the code matter? what are limitations on the number of spaces and other <sup>white</sup> spaces we have in the code? explain the best of your knowledge.

Answer 14: whitespace does matter in the code

when we use it to break combined letters it will lose its meaning and it wouldn't work, otherwise whitespace doesn't matter.

All binary operators should separate from their operands by spaces.

unary operators doesn't need to separate by spaces.

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~~Line~~ whitespace separates two words.

white space is one more character (such as space, tab, enter,) that do not produce a visible mark. Java will ignore whitespace in code.

Putting properly spaced whitespaces help the code be more readable.

Question 15: What is identifier for objects, class, method, or variable? Explain each one rules and norms and give code example.

Answer 15: Identifier is a name to represent a variable, object, class, method.

a - class and interface identifier always is Capital Camel Case it start with capital letters.

example = public class MoneyRunner { }

b - Project = with lower Camel Case start with lower case. example = newProject .

c - method = with lower camel case, start with lower case. example = public String getFirstName() { return FirstName; }

~~11/18~~

D = Variable = identify with lowerCamelCase

example = int fibNum = 13;

identifier contains (A-Z), (a-z) digit (0-9)  
dollar sign \$ under score,

but identifier can not start with digit.

Question 16: what are the primitive data types in java? explain each and give examples of how would you use each. write the syntax use for each.

Answer 16: primitive data types pre-define by java and it has eight(8) types, as below.

1. byte = use for store ( $\pm 127$ ) few numbers.

example. byte a = 5;

2. short = use to store ( $\pm 32$ ) it store more number than byte. ex = short a = 376;

3. int = ~~integer~~ is use a lot for storing numbers it store ( $\pm 2,147,483$ ) number.  
example int a = 186;

4 = long = is used to store numbers, with long we can store a large amount of numbers like ( $\pm 9,223,372,096,1854$ ). using mostly to count the population.  
long a = 1267893!

5 = boolean = use when the return should be True or False. ex: boolean a = True

6 = char = is used for one character.  
ex: char x = 'a'?

7 = float = use to store or compute rational number or number with decimal point if has about six(6) decimal digits of accuracy.  
ex: float ~~a~~<sup>F</sup> = 13.66! we have to write (f) with float otherwise it assume double.

8 = double = is use a lot in java to store or compute rational number with greater range of about (15) decimal digit of accuracy.  
ex: double a = 15.73?

Question 17 = what is assignment operator? explain with code.

Answer 17 = assignment is use to assign value to a variable, the left side operand is variable and the right side operand is

13,

Value, the right side value should be same as left side data type otherwise compiler will raise error.  
ex: int x = 10;

Question 18 = What is class? explain with example of code, and how you use classes.

Answer 18 = In object oriented programming

class can be define as template or blue print, and class has to members variable and method for creating object. When a class instantiated we can

access to all of variable and method of class.

Ex = public class Khalid { String name = "John";  
public String getName() { return name; } }

Question 19 = What is an object? explain with example of code and how you use object.

Answer 19 = An entity which has state and behavior is known as an object. Also instance of class is called object.

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example of object:

BrowserInterface browser = new Firefox();  
left side is our class and the right side  
is our instance.

Question 20: what are members of a class?

explain each with code examples.

Answer 20: a class has two members variable  
and methods.

a - Variable is data container, or it hold data.  
char gender = 'F';

b - method = is a block of code which use to  
perform a certain action, it run only when  
call the method, we use method to reuse it  
once write use it many times.

ex= public char getGender() { return gender; }

Question 21: what is difference between  
declaring and instantiating a variable?

explain with code examples.

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Answer 21 = declaring is the process of creating variables ~~but~~ with no assignment of value. ex: int age;

Instantiating = means to call constructor of a class, or creating instance or object of class.  
ex = Book History = new Book();

Question 22 = How to we instantiate an object?

What do we need to be able to instantiate an object?

Answer 22 = First we need to create a class with constructor and method, then we would be able to instantiate an object of that class by creating object and then calling the class constructor and method.

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Question 23 = what do we mean by literal value? explain with example.

Answer 23 = a constant or exact value which compatible to a data type, and it assign to a variable, with string, literal value should be inside double quotations (" ") -  
ex = String name = "Khalid";

Question 24 = what is concatenation? explain with example -

Answer 24 = concatenation is operation of printing to value side by side, string concatenation forms a new string with is the combination of multiple string, we have two way to concat string, 1 by + operator and 2 by concat() method - ex =

String a = "Khalid"; String b = "Emad";  
System.out.println(a + b);

System.out.println(a.concat(b));

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Question 25 = what is string? explain with example.

Answer 25 = string is a reference data type which is used to store text, these text or collection of characters surrounded by double quotes. ex =

String name = "TEK School";

Question 26 = what are the arithmetic operators? explain each and give example code for each.

Answer 26 = Java provides Arithmetic operators

For mathematical operations, below is types of Arithmetic operators.

a = + or Addition = to add two operands.

b = - or subtraction = to subtract two operands.

c = \* or Multiplication = to multiply two values.

E = / or Division = to divide two operands

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$F = \%$  or Modulus = to get the remainder of division of two operands.

Question 27 = what is the precedence of Arithmetic operators and parenthesis? Explain and give code example.

Answer 27 = precedence is priority on expressions that which one should evaluate and execute first below operators from left to right will execute in order.

( ), ++, --, \*, /, %, +, -, >, <, >=, <=, ==, !=,

$^, !, \text{ ex } = \text{System.out.println}(2+3 \times 1+(3-1) \neq 2)$   
result = 6.

Question 28 = what are the limitations on division for integer and double variables? Explain with examples and results.

Answer 28 = limitations on division for integer is, if you divide two integer result is

integer, if you want to get decimal point

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Answer 38: 'for' loop is used to iterate a set of statements as many as you defined in the condition.

Syntax of 'For' loop is:

For(initialization; condition; update){  
    body }

When we initialize then it will check

the condition and will execute body if condition is true it update iteration.

For(int i=0; i<5; i++){ System.out.println(i);}  
result is print 1 to 4 because condition is  
true it will update iterate 4 times.

Question 39: explain while loop in detail and give code example.

Answer 39: iterate a set of statements

and first check the condition then

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or if you want to print more precise should use double or perform promotion operation

```
int x = 5; int y = 10; int a = ((double)x+y);  
double a = (x+y); System.out.println(a);  
result = 15.00
```

and if you want to divide an integer by 0 you will get exception.

Limitations on double is if you want to divide a double number by double you will get double number, but if you want to get without decimal point you

need do down casting ex: double a = 13.7;  
double b = 4.5;  
int x = (int)(a/b); System.out.println(x);

Question 29: How do we explicitly cast data types?  
give code example.

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Answer 29 = explicitly cast or narrowing casting  
converting a larger data type to a smaller  
data type. ex = int x = 5; double y = 15.3;  
int c = (int)(y/x); System.out.println(c);

a) Type when we assign the value of one  
primitive data type to another type.  
we two types of casting.

a - widening casting = converting smaller  
data type to larger data type.

b - narrowing casting I mentioned above.

Question 30 = How do we use short cut  
Arithmetic operators? Give code example.

Answer 30 = short cut Arithmetic operators also  
called shortcircuit, we can use them with  
and && and or ||.  
as with and && use only when first part of  
code is false, jvm will not read the rest

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code and print it false.

$b = \text{or} \text{||}$  with use only when first part of our code is True then will not read the rest of our code and will print True.

ex= int a=10! int b = 3! if(a>12&&b<7){

System.out.println("a is correct")!

} else { System.out.println("b is correct") }

- result=b is correct.

if(true||false||false){ System.out.println("true") }

} else { System.out.println("false") }

result=true.

Question 31= What is increment & decrement in both prefix and postfix? explain each in detail and give code example for each.

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Answer 31 = increment and decrement operators known as unary operators because they operate on a single operand.

~~post~~-increment operator will add  $(++) 1$

- decrement operator  $(--)$  will subtract  $1$   
- pre-increment, operator use in front of operand

first add 1 then assign to variable

ex = int a = 10; System.out.println (++a);

result = 11.

post-increment, operators use after operand

first it will assign to variable and then

will increment by 1.

int a = 10; System.out.println (a++);

result = 10

→ pre-decrement = operator use in front of operand

first it will subtract 1 then assign to variable

ex = int a = 10; System.out.println (--a);

result = 9

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post-decrement, operator use after Operand, first it will assign to variable then it will decrease by 1 -

ex = int a = 9; System.out.println(a--);  
result = 9.

Q32 = what is escape sequence?  
explain and give example in code.

Answer 32 = escape sequence is a character with backslash (\) we use it to perform some specific task like - \n = will insert new line, \t = will insert a tab, \" = will insert double quote.

ex = System.out.println("This is\\ninteresting")  
result = This is  
          interesting .

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Question 33 = what is an array? what is the use of arrays? What are the limitations on arrays? explain and give code example.

Answer 33 = arrays approach index arrays are used to store multiple values in a single variable, instead of declaring separate variables for each value.

The limitations or disadvantages of array is a = array is fix in size, we will specify how many elements do we have when we create array.

b - arrays are fix in data type, we should use reference data type, if we want to use primitive data type we should use wrapper class. ex =

String [] car = {"toyota", "corolla", "Ford", "BMW"}  
int [] num = {10, 20, 30, 40};

25-

Question 34: what is syntax structure of arrays? explain and code example.

Answer 34: Syntax structure of an array is  
datatype - square bracket - variable name -  
Assign - values.

~~String [] months = { "Jan", "Feb", "March", "Apr" };~~

When we create our array we have to

specify the number of values. ex

~~int [] array = new int[3];~~

~~array[0] = 10;~~

~~array[1] = 20; array[2] = 30;~~

Question 35 = How many dimensions can you have on an array? Give example and explain one dimension and 2 dimension array.

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Answer 35 = we have three types of dimensions array. one dimensional array, two dimensional array, multidimensional array.

a = one dimensional array = is made of same data type variable is one of dimensional.

b = tow dimensional array = is made by multi single dimension, it is like a table.

ex = int [ ] num = new int [3]! - one di

ex = int [ ][ ] temp = new int [3] [4]! ~~two di~~

Question 36 = What is loop? what does the word 'iteration' mean? why do we use loop.

Answer 36 = loop is a control statement which iterate a set of statements many and many times bas on condition.

iterate = means is process of repeating steps.

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we use loop because it can execute a block of code as long as a specified condition is done, we can save time and loop is more readable.

Question 37 = How many types of loop have studied.

Answer 37: we have studied four types of loop so far, as below.

1: while loop. 2: do while loop.

3: For loop. 4: for each loop.

Question 38: explain for loop in detail and give example in code. make sure to cover each section of syntax and explain what goes where. and try to clarify flow of execution with your examples -

Ans

Answer 49: in return type we actually define or specify that what type of value a method returns. example  
public int div(int x, int y) {  
return (x/y); }

in above example we defined our return type 'int' so we will get 'int'

Question 50: where do we define what a method returns? in other words, where is the output of a method defined? refer to your structure and explain with code example.

Answer 50: inside curly brace of a method or body of method we can specify what a method return. example -

public int multiplication(int x, int y),  
return (x \* y); }

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Answer 38: 'for' loop is used to iterate a set of statements as many as you defined in the condition.

Syntax of 'For' loop is:

For(initialization; condition; update){  
body }

When we initialize then it will check

the condition and will execute body if condition is true it update iteration.

For(int i=0; i<5; i++){ System.out.println(i);}

result is print 1 to 4 because condition is

true it will ~~update~~ iterate 4 times.

Question 39: explain while loop in detail and give code example.

Answer 39: iterate a set of statements

and first check the condition then

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check the body. example:

`int i=0; while (i<5) { System.out.println(i); }`

in the example above it run the code

over and over until reach to less than 5.

Question 40: what are the differences  
between while and for loops?

Answer 40: For loop mainly use increment  
or decrement.

when the number of iteration is pre-defined  
we usually use for loop, and if the

iteration number is not define in  
advance we use while loop, ~~it know~~  
~~should iterate at least one in~~  
~~while loop~~.

Question 41: what is difference between  
class and object? what is the relation  
between them? explain.

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Answer 41: class is a template or blueprint  
but class object is the instance of class  
also class has methods and constructors  
but object doesn't have.

class has every thing for share with  
object, but object doesn't have anything

for share.

class is one, but you can execute  
many object of that.

The relation is object call the methods  
of class. and object is copy of  
class.

a class doesn't allocate memory space  
on the other hand object allocates  
memory space.

a class is a logical entity while an object  
is a physical entity.

3)

Question 42: How many types of have we covered in class?

Answer 42: we have covered two types of method in class, as below.

1 general method/function

2 constructor. we have two types of constructors, 1 default constructor. 2

parameterized constructor.

Question 43: what is the structure of a constructor method? what are the rules of constructor method? why do we use constructors?

Answer 43: constructor is a block of code similar to method it is called when instance of class is created,

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rules of constructor is:

- 1 constructor doesn't have return type.
- 2 constructor name should match the name of class.
- 3 constructor must have unique signature.

We use constructor for creating object or initialize the object.

Question 44: explain get, set methods with code example. Start by defining structure of method and then explain each type of method?

Answer 44: get and set methods are used when we use private access modifier so we want to take control of our data in this case we use get method & accessor

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to give access the data to the caller  
of getmethod, get method return the value  
of variable name. example  
public string Getfullname() { return  
 fullname }

Set method / mutator is also you want  
to give control of data to change it  
to caller of method be able to change  
base on needs. example

public void Setfullname(string fullname) {

this.fullname = fullname }  
caller of set method would be able to  
modify the value of variable.

Question 45: Can we have two method  
with <sup>same</sup> identifier? Explain your answer.

Answer 45: Java programming language  
support overloading methods, it means

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than we can have many methods with same identifier, but parameter should be different, overloading method happens in same class.

Question 46: What is method overloading? Explain with code example.

Answer 46: overloading / static polymorphism

Or compile-time polymorphism, overloading allows different method have the same name but different signatures, where signature can be differ by number of input parameters or type input parameters overloading happens in same class

Example: public class Sum {

public int sum (int x, int y) {

return (x+y); }

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~~public int sum(int x, int y, int z) {  
 return (x+y+z); }~~

Question 47: what is keyword 'this'?  
what is use? explain in code.

Answer 47: 'this' keyword refers to  
the current object in a method or  
constructor.

it will remove confusion between class  
attributes and parameters with the  
same name.

~~public class Main { int a;~~

~~public Main() { this.a = 1; }~~

Question 48: what is the structure of  
a class? what goes first, second...? give  
example and explain why things have to  
be in place.

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Answer 48: First a class should be in a package, then a class structure

start with Access modifier, it will specify accessibility, then the 'class' keyword used to specify a class, then

the name of a class, then we have opening curly brace, inside curly brace we could have class instance variable, constructor, method,

public class Math { String name?  
int age! - - .

all element designed to be in order otherwise we will get error.

Question 49: where we define what a method takes? in other words, where is the input of a method defined?  
refer to your structure and explain with code example.

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Answer 49: in return type we actually define or specify that what type of value a method returns - example

```
public int div(int x, int y) {  
    return (x/y); }
```

in above example we defined our return type 'int' so we will get 'int'

Question 50: where do we define what a method returns? in other words, where is the output of a method defined? refer to your structure and explain with code example.

Answer 50: inside curly brace of a method or body of method we can specify what a method return - example -

```
public int multiplication(int x, int y),  
    return (x * y); }
```

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inside the body we specified that this method should return multiplication of those given numbers.

Question 51: where do we define what a method performs? in other words, where is the process/work/job of a method defined? refer to your structure and with code examples.

Answer 51: we define the performance of a method inside the body of method or the functionality of method define in implementation. example:

```
public int sum(int a, int b){
```

```
    return (a+b); }
```

actually the return inside the body define what does this method performs.

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Question 52: Assuming that I have a main method inside my class, can I have custom method in that class?

Can I run the method in the main method of the same class? where should things go in such scenario? explain with code and point out can do and can not do of this scenario.

Answer 52: in a class if we have main method we can have custom method and also we can run it in the same class by considering its rules. example you can create first your method then you can call it on top of same class code sample.

Q8/

```
public class Method {  
    public static void main (String [] args) {  
        multiply (3, 5); } }  
public static void multiply (int a, int b) {  
    System.out.println (a * b); }
```

in the above example we first create the method then at the top create a object of method and run it.

— The End —

