Name: Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
END Semester Examination, May 2023

Course: Advanced Functional Thinking **Semester: 6**
Program: B.Tech CSE (Big Data Minor) **Time: 03 hrs.**
Course Code: CSBD3002P **Max. Marks: 100**

Instructions: There are three Sections. Attempt all questions.

SECTION A

S. No.		Marks	CO
Q1	Define identifiers. List and explain different Scala Identifiers in brief.	4	CO1
Q2	Using examples explain the difference between var and val keywords in SCALA.	4	CO1
Q3	With the help of an example, illustrate the properties of a pure function.	4	CO1
Q4	What is a programming paradigm? Compare Imperative and declarative programming paradigms.	4	CO1
Q5	What is the difference between functions and methods in Scala.	4	CO2
	SECTION B		
Q6	List benefits of a Functional programming language. How is SCALA different from Java?	10	CO1
Q7	Compare strict and lazy evaluation. Write SCALA code for both to illustrate the execution difference between them.	10	CO3
Q8	i. Define SCALA stream. Give an example each of a finite stream and an infinite stream. ii. val stream=77#::99#::69#::Stream.empty println(stream) println(stream.head) println(stream.take(3).min) println(stream.map{_*2}(2)) println(stream)	10	CO2

Q9	i. Define recursion. How does tail recursion helps in solving stack overflow problem of recursion? ii. Write a code to compute factorial for given user number using tail recursion. Or i. What is Proxy pattern? With help of a diagram, illustrate the process of Client accessing the real objects via Proxy. ii. Create a Scala program to reverse, and then format to upper case, the given String: "Scala-Community/Scala-Exercises". Format the String to replace Scala with Java.	**10**	**CO3**
SECTION C			
Q10	i. Define Traits in Scala. How do they help in achieving multiple inheritance? ii. Create a Scala program to represent a List with a sequence of number from 100 to 150. You should omit the last numeric item of 150, and each numeric item should have a 10 numeric interval. You should then calculate the sum of all the numeric items in the List. Or i. Define Functors and Monads in Scala with examples. ii. Create a class called Employee whose objects are records for an employee. This class will be a derived class of the class person which you will have to copy into a file of your own and compile. An employee record has an employee's name (inherited from the class person), an annual salary represented as a single value of type double, a year the employee started work as a single value of type int and a national insurance number, which is a value of type string.	**10+10**	**CO3**
Q11	i. Discuss type inference property of Scala with an example. ii. Give the output for following: a. println("BatMaTSatRatIn".drop(3).take(7).replace("t", "s")) println(List(1,2,3).flatMap(x=>List(x,4, x*2))) b. def quadruple(x:Int):Int=x*4 val quadrupleCopy=quadruple _ println(quadrupleCopy(-1) + quadruple(2)) c. val fruits = List("mango", "apple", "pear") val fruits1=fruits.updated(1, "orange") println(fruits.flatMap(_.toUpperCase)) println(fruits1.filter(_.take(1)=="o"))	**5+15**	**CO2**