University of Mumbai

Examination 2021 under cluster 7 (Lead College: SSJCOE)

Examinations Commencing from 15th June 2021 to 24th June 2021

Program: **Information Technology**

Curriculum Scheme: Rev2019

Examination: DSE (Reduced Syllabus) (REV-2019 'C' Scheme) KT.

Course Code: ITC305 and Course Name: Paradigms and Computer Programming Fundamentals

Time: 2 hour Max. Marks: 80

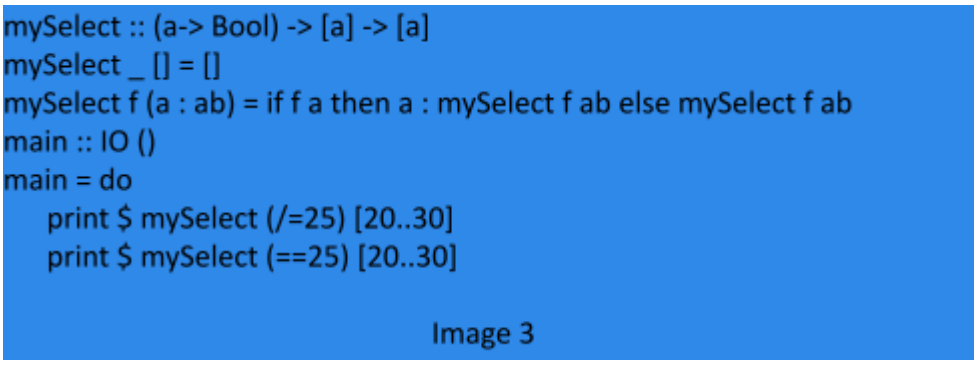
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Which of the following is **NOT** a correct syntax for a type signature of a Haskell function ?
Option A:	sort :: [a] -> [a]
Option B:	sort :: Ord [a] -> Ord [a]
Option C:	sort :: (Num a, Ord a) => [a] -> [a]
Option D:	sort :: Ord a => [a] -> [a]
2.	Following Image 1 shows predicates defined in two distinct prolog files KB1 and KB2 Which of the following statements is true about the above two Kbs KB-1: edge(a,b). edge(b,c). path(X, X). path(X, Y) :- edge(Z, Y), path(X, Z). KB-2: edge(a,b). edge(b,c). path(X, Y) :- path(X, Z),edge(Z, Y). path(X, X). Image 1
Option A:	Query path(a,a) will evaluate as true in both KBs
Option B:	Query path(a,a) will evaluate as false in both KBs
Option C:	Query path(a,a) will evaluate as true in KB-1 and false in KB-2
Option D:	Query path(a,a) will evaluate as true in KB-1 and will not terminate in KB-2

3.	_____ is the process of associating names to a much complicated programming fragment, so that it (the programming fragment) can be thought in terms of its functionality or purpose rather than how actually the functionality is carried out.
Option A:	Recursion
Option B:	Abstraction
Option C:	Repetition
Option D:	Inclusion
4.	Object lifetimes generally correspond to one of three principal storage allocation mechanism. Which of the following is **not** a principal storage allocation mechanism.
Option A:	Static
Option B:	Random Access
Option C:	Stack
Option D:	Heap
5.	Following Image 2 shows a knowledge base. takes(sujay, ME201). takes(sujay, ITC305). takes(abhay, ME302). takes(abhay, ITC305). classmates(X, Y) :- takes(X, Z), takes(Y, Z). Image 2 Which of the following is correct re-declaration of predicate "**classmate**" that will never result in attributing a student to be his/her own classmate. e.g. we do not want the query **"classmates(sujay, sujay)"** to evaluate as **true**.
Option A:	No change in 'classmates' predicate declaration is required.
Option B:	This can't be achieved by only changing the predicate 'classmates'.
Option C:	New declaration of 'classmates' will be: classmates(X, Y) :- takes(X, Z), takes(Y, Z), X \= Y.
Option D:	New declaration of 'classmates' will be: classmates(X, Y) :- X \= Y, takes(X, Z), takes(Y, Z).
6.	In Prolog,backward chaining search strategy starts with ____

Option A:	existing clauses
Option B:	goal
Option C:	first clauses
Option D:	last clause
7.	Translation of high-level language to assembly or machine language is the job of a system program known as a _____.
Option A:	compiler.
Option B:	converter
Option C:	processor
Option D:	composer

8.	Consider following Haskell Function is loaded in ghci session:
	`myFun t mylist = do`
	`if (mylist == [])`
	`then t`
	`else myFun (t + (head mylist)) (tail mylist)`
	If we provide input **myFun 3 [2,5,4,5,6]** at prelude what is the expected output

Option A:	25
Option B:	[24]
Option C:	24
Option D:	[25]
9.	Haskell prelude functions like map, foldl and foldr are examples of _____.
Option A:	Currying function
Option B:	Higher order function
Option C:	Anonymous function
Option D:	polymorphism
10.	Image 3 shows the haskell code.

	 Image 3 Which of the following options represents correct output when main is executed?
Option A:	[20, 21, 22, 23, 24, 26, 27, 28, 29, 30] [25]
Option B:	[20, 21, 22, 23, 24, 26, 27, 28, 29, 30] 25
Option C:	[21, 22, 23, 24, 26, 27, 28, 29] [25]
Option D:	20, 21, 22, 23, 24, 26, 27, 28, 29, 30 25
11.	Data types like Arrays, Object and Records are referred to as
Option A:	Context types
Option B:	Composite Types
Option C:	Numeric types
Option D:	User defined Types
12.	Functional Programming finds its roots in _____.
Option A:	Turing Theory
Option B:	Lambda Calculus
Option C:	Post Hypothesis
Option D:	Kleene Theory
13.	When object is strictly defined with its type and if it enforces strong typing at compile time then language is known as_____
Option A:	Statically typed language

Option B:	Dynamically typed language
Option C:	Poorly typed language
Option D:	Run time language
14.	Which of the following is not true about Guards?
Option A:	Provides multiple statements for different conditions
Option B:	Guards of a function evaluate from bottom to top
Option C:	If no guards are true, none of the definitions are used
Option D:	Makes the code more readable
15.	Which is **NOT** one of the unification rules in prolog.
Option A:	A constant unifies only with itself.
Option B:	Two structures unify if and only if they have the same predicate name and the same arity, and the corresponding arguments unify recursively.
Option C:	A variable unifies with anything. If the other thing has a value, then the variable is instantiated. If the other thing is an uninstantiated variable, then the two variables are associated in such a way that if either is given a value later, that value will be shared by both.
Option D:	It is sufficient to consider that two structures unify each other when they have the same predicate name and the same arity.
16.	Which is the most suitable paradigm to choose to implement the following case: "In a large warehouse, autonomous robots need to transport and place pallets of inventory from one location to another" ?
Option A:	Functional
Option B:	Logical
Option C:	Scripting
Option D:	Concurrent
17.	In logic Programming axioms are written in a standard form known as a _____
Option A:	Data clause
Option B:	Program Clause
Option C:	Horn Clause

Option D:	Error Clause
18.	Which one of the ollowing query would return true/yes for the given prolog KB ? mango(alphonso,1000). vegetable(cabbage,40). fruit(alphonso,1000).
Option A:	?- mango(alphonso,1000).
Option B:	?- mango('alphonso',1000).
Option C:	?- mango(A,1000).
Option D:	?- mango(1000,alphonso).
19.	Which is **NOT** a type class in Haskell.
Option A:	Show
Option B:	Read
Option C:	Bounded
Option D:	Binding
20.	ArithmeticException is thrown in which of the following cases of executions?
Option A:	Divide by zero
Option B:	Divide by one
Option C:	Divide by float
Option D:	Divide by double

Q2.	**Solve any Four out of Six** **5 marks each**
A	Write prolog code to complete following tasks: (Solve any 2) a. To find the length of the list of student names. b. To find if a number is present in a number list c. To sum all elements in the list Clearly show with example how to query your prolog KB to complete specific operation.
B	Which are important factors to be considered, while making a choice of a programming language ?
C	What is a guard expression? Give an example and explain how to implement a tail function using guard expression in haskell.

D	Describe the difference between forward chaining and backward chaining. Which is used in Prolog by default?
E	Explain concept of polymorphism in haskell with an example.
F	Explain static scoping rules for programming languages that support nested subroutines
Q3.	**Solve any Four out of Six** **5 marks each**
A	Which principal storage allocation mechanism used to manage an object's space?
B	Explain features of Functional Programming Languages.
C	Name and explain use of any 5 list processing function in haskell's prelude library.
D	Briefly describe the process of resolution and unification in logic programming with example.
E	Explain how Prolog differs from imperative languages in its handling of arithmetic.
F	Describe different parameter passing modes.

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Question Number	Correct Option
Q1.	B
Q2.	D
Q3.	B
Q4	B
Q5	C
Q6	B
Q7	A
Q8.	D
Q9.	B
Q10.	A
Q11.	B
Q12.	B
Q13.	A
Q14.	B
Q15.	D
Q16.	B
Q17.	C
Q18.	A
Q19.	D
Q20.	A