University of Mumbai
Examination 2020
Program: **INFORMATION TECHNOLOGY**
Curriculum Scheme: Rev2019
Examination: DSE Semester III
Course Code: ITC305 and Course Name: PCPF

Time: 2 hour   Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Which is **NOT,** one of the standard Haskell type
Option A:	Booleans
Option B:	Lists
Option C:	Tuples
Option D:	Structures
2.	Consider following predicates shown in Image 1 that are defined in two distinct prolog files.Which of the following statements is **TRUE** about the above two KBs
Option A:	Query route(b,b) will evaluate as true in both KBs
Option B:	Query route(b,b) will evaluate as false in both KBs
Option C:	Query route(b,b) will evaluate as true in KB-1 and false in KB-2
Option D:	Query route(b,b) will evaluate as true in KB-1 and will not terminate in KB-2
3.	Which of the following programming concepts shown by Object Oriented Programming Languages are examples of use of polymorphism?
Option A:	function overriding, extending an interface, abstract base class
Option B:	function overloading, friend function, creation of package/module
Option C:	creation of package/module, multiple constructors for same class, encapsulating members in Class
Option D:	function overriding, function overloading, encapsulating members in Class
4.	Consider the knowledge base shown in Image 2 below. Which option represents **all result/s** in the correct order, when the query "colleagues(amar,X)." is submitted to a prolog interpreter.

worksfor(amar, infosys).
worksfor(amit, infosys).
worksfor(anagha, syntel).
worksfor(ajit, syntel).
colleagues(X, Y) :- worksfor(X, Z), worksfor(Y, Z).

Image 2

Option A:	X=amar; X=amit
Option B:	X=amit; X=amar
Option C:	X=amit
Option D:	X=amar
5.	Consider the following expression shown in Image is executed in ghci on prelude prompt, What will be the output?

Prelude> zipWith (++) ['A','O','C','M'] ["pple", "range", "l·····", "·····"] |
Option A:	["Apple","Orange","Cherry","Mango"]
Option B:	"Apple","Orange","Cherry","Mango"
Option C:	['Apple','Orange','Cherry','Mango']
Option D:	Error in execution as we cannot concatenate char with [char]
6.	Consider declaration of predicate "*natural*" shown in Image 5 below Which is the most appropriate description for this declaration ?

natural(1).
natural(N) :- natural(M), N is M+1.

Image 5 |
Option A:	It represents a generator for an infinite set of all natural numbers.
Option B:	It is a test for checking whether an input number is natural or not.
Option C:	It represents a generate and validate idiom in prolog programming.
Option D:	It will only be true for natural(1) and will throw an error for any query natural(n) where n is a natural number other than 1.
7.	Image refers to the definition for user defined Haskell function "**rope**". what will be the output, if we apply the "**rope**" function to input **21**?

```
rope :: (Integral a) => a -> [a]
rope 1 = [1]
rope n
    | even n =  n:rope (n `div` 2)
    | odd n  =  n:rope (n*3 + 1)
```

Option A:	[21,64,32,16,8,4,2,1]
Option B:	21,64,32,16,8,4,2,1
Option C:	[64,32,16,8,4,2,1]
Option D:	64,32,16,8,4,2,1
8.	In simple Prolog implementation, which type refers to a symbol which represents a value like "a" or "b".
Option A:	Boolean
Option B:	Variable
Option C:	Atom
Option D:	Real
9.	What is the use of '=' in prolog programming?
Option A:	Unification
Option B:	Arithmetic Evaluation
Option C:	Reduction
Option D:	None of the above
10.	What is the use of 'is' in prolog programming?
Option A:	Unification
Option B:	Arithmetic Evaluation
Option C:	Reduction
Option D:	None of the above
11.	Why We Use Prolog Programming Language?
Option A:	SWI-Prolog is free, open-source, and very well maintained.
Option B:	It's much much easier to distribute SWI-Prolog applications than Java ones
Option C:	Prolog is much less verbose,which is helpful when during development.
Option D:	All of the above
12.	In Prolog, a _____ refers to an ordered sequence of elements.
Option A:	Tuple
Option B:	Lists
Option C:	Dictionary
Option D:	Array
13.	Which of the following is used place the new clause below the other mypred clauses in the database?
Option A:	assertz
Option B:	Asserta
Option C:	Length

Option D:	append
14.	Which of the following is used to place the new clause above the other mypred clauses in the database?
Option A:	assertz
Option B:	Asserta
Option C:	Length
Option D:	append
15.	Which of the following is classified as a list?
Option A:	(a,b,c)
Option B:	[a,b,c]
Option C:	[1,2,3]
Option D:	['1','2','3']
16.	What is meant by; "Haskell is Statically typed" ?
Option A:	Every expression in Haskell has a type which is determined at compile time
Option B:	You don't have to explicitly write out every type in a Haskell program
Option C:	Haskell has explicit handling of effects
Option D:	Functions don't evaluate their arguments
17.	Say True or False; Haskell is an example of Functional Programming Paradigm.
Option A:	True
Option B:	False
Option C:	--
Option D:	--
18.	Evaluate the function, f(x)=2x, when x=4.
Option A:	f(4)=4
Option B:	f(4)=2
Option C:	f(4)=6
Option D:	f(4)=8
19.	What programming paradigm - uses classes ?
Option A:	Procedural
Option B:	Declarative
Option C:	Functional
Option D:	Object Oriented
20.	Which of the following is a compiler used to compile Haskell programs?
Option A:	Open64
Option B:	GCC
Option C:	GHC
Option D:	MinGW

Q2.	Solve any Two Questions out of Three	10 marks each
A	Explain with example the difference between declarative and imperative programming paradigm.	
B	Briefly describe the process of resolution and unification in logic programming with example.	
C	What mathematical formalism underlies functional programming?	

Q3.	Solve any Two Questions out of Three	10 marks each
A	Define Haskell function that inputs one operator +,-,*,^ and two operands which may be Int, Integer, Float or Double. The function will perform the operation and computes the result. Clearly mention the type signature for the function. Note: Students are not expected to write the main function and do user IO.	
B	Explain various programming paradigms.	
C	Explain the database manipulation commands in Prolog.	