Q1)1,2

| Q1. | **Choose the correct option for the following questions. All the questions are compulsory and carry equal marks** |
|---|---|
| 1. | Object lifetimes generally correspond to one of three principal storage allocation mechanisms. Which of the following is **not** a principal storage allocation mechanism. |
| Option A: | Static |
| Option B: | Random Access |
| Option C: | Stack |
| Option D: | Heap |
| | |
| 2. | _____allocated memory objects reside in a fixed zone of memory |
| Option A: | Statically |
| Option B: | Dynamically |
| Option C: | Freely |
| Option D: | Completely |

Q1)3,4,5

| | |
|---|---|
| 3. | 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 |
| | |
| 4. | To maintain the stack layout following steps are followed by the caller in some order. Find out which is the first step? |
| Option A: | Computes the values of arguments and moves them into the stack or registers |
| Option B: | Uses a special subroutine call instruction to jump to the subroutine, simultaneously passing the return address on the stack or in a register |
| Option C: | Saves any caller-saved registers whose values will be needed after the call is served |
| Option D: | Computes the static link and passes it as an extra, hidden argument |
| | |
| 5. | Higher-order functions and recursion are the basic ingredients of _____ computational model. |
| Option A: | stateless |
| Option B: | stateful |
| Option C: | in-state |
| Option D: | out-state |

Q1)6,7,8

| | |
|---|---|
| 6. | 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 |
| | |
| 7. | Functional Programming finds its roots in _____. |
| Option A: | Turing Theory |
| Option B: | Post Hypothesis |
| Option C: | Lambda Calculus |
| Option D: | Kleene Theory |
| | |
| 8. | In Prolog, backward chaining search strategy starts with ____ |
| Option A: | existing clauses |
| Option B: | goal |
| Option C: | first clauses |
| Option D: | last clause |
| | |

Q1)9,10

| | |
|---|---|
| 9. | In Prolog premise is called as___and consequent is called as____ |
| Option A: | subgoal,goal |
| Option B: | subgoal,tail |
| Option C: | head,tail |
| Option D: | tail,head |
| | |
| 10. | What will be the answer by the Prolog interpreter for the following query:<br>?- [[],p] = [X,Y\|Z]. |
| Option A: | **X = Z, Z = [],**<br>**Y = p.** |
| Option B: | **X** = p,<br>**Y** = [ ], **Z** = [ ] |
| Option C: | **Error** |
| Option D: | **X** = p,<br>**Y** = Z, **Z** = _ |

Q2,Q3

| Q2. | Solve the following. (20 Marks) |
|---|---|
| A | **Solve any Two** **5 marks each** |
| i. | Write following English statements in Prolog. Mention which are facts and rules.<br>a. Ram writes a book.<br>b. Sham reads a book if it is written by Ram.<br>c. If someone reads any book then he is a scholar.<br>d. If someone reads a book written by Ram he is a fan of Ram .<br>e. Sham is a fan of ram. |
| ii. | Differentiate early binding times and late binding times. |
| iii. | Describe the concept of gated expressions in Haskell with an example. |
| B | **Solve any One** **10 marks each** |
| i. | What do you mean by type class ? Explain in detail. |
| ii. | Explain unification in prolog with the help of an example. Describe the unification rules for prolog. |

| Q3 | Solve the following. (20 Marks ) |
|---|---|
| A | **Solve any Two** **5 marks each** |
| i. | What is pattern matching in Haskell ? Explain with the example. |
| ii. | What is a composite data type? Explain different composite data types. |
| iii. | Name and explain use of any 5 list processing function in Haskell's prelude library |
| B | **Solve any One** **10 marks each** |
| i. | Illustrate storage management mechanisms with the help of labeled diagrams. |
| ii. | Describe the Prolog search strategy. Discuss backtracking and the instantiation of variables. |

Q4)

| Q4 | *Solve the following.* (20 Marks ) |
|---|---|
| A | **Solve any Two** **5 marks each** |
| i. | Explain the concept of Higher Order function in Functional programming with an example. |
| ii. | Compare Imperative and Declarative paradigms with reference to, definition, purpose, complexity, flexibility, subcategory and applications. |
| iii. | Which are important factors to be considered, while making a choice of a programming language ? |
| B | **Solve any One** **10 marks each** |
| i. | Describe functional language features in detail. Which are often missing in imperative programming languages. |
| ii. | Consider following knowledge base in prolog:<br>smog(delhi).<br>smog(simla).<br>fog(delhi).<br>polluted(X) :- smog(X), fog(X).<br><br>Explain how the following three queries are answered by the Prolog system and also tell the output given by Prolog when you submit these queries.<br>a. polluted(X) b. polluted(simla) |