B.Tech CSE Nov-24

P.T.U Question Papers B.Tech

Roll No. | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (AIML/ CSE/ CSD) (Sem.–3)

OBJECT ORIENTED PROGRAMMING

Subject Code : BTCS302-18

M.Code : S76437

Date of Examiantion: 18-01-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly:

a. Discuss the issues of procedure oriented systems with respect to object oriented systems.

b. What is the use of static "function?

c. Define Member functions.

d. Discuss the use of nested class.

e. Advantages of function overriding.

f. Give the concept of union.

g. What are the types of type conversions?

h. Discuss base class.

i. What is the use of binding?

j. What is a virtual function?

SECTION-B

2. Explain the steps of input of numbers using arrays.

3. Write the general syntax and working of class and objects in C++.

4. Explain in Memory management in object orientation approach.

5. Explain different string handling functions with examples.

6. What is the benefit of constructor? Write about copy constructor.

SECTION-C

7. Define the pointer with an example, indicate the steps involved in referring to members of the invoking object.

8. What does inheritance mean in C++? What are different forms of inheritance?

9. What is the use of operator overloading? Write a program to any operator.

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B.Tech. (AI&ML/DS/Block Chain/CSE/CS/CSD/ECE/Robotics & Artificial Intelligence/Internet of Things and Cyber Security including Block Chain Technology) (Sem.–3)

DEVELOPMENT OF SOCIETIES

Subject Code : HSMC101-18

M.Code : 76439

Date of Examination : 11-01-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES:

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3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Write briefly:**

   a) Discuss importance of the origin of family system.

   b) Two merits of Social System.

   c) Throw light on the role of individual in the development of society.

   d) Define Social structure.

   e) Who is the founder of political system?

   f) Discuss main features of Governance.

   g) What are capitalism's essential features?

   h) Describe nature of idea of development.

   i) Who is the father of development of Ethics?

   j) How does Buddhism affect economics?

SECTION-B

2. What is the role of clan in the development of society?

3. Write in detail about the founder of Political system.

4. How does Socialism affect society?

5. What are the main ideas of development?

6. Examine Buddhist model of economic development.

SECTION-C

7. Describe in detail major concepts of Social systems.

8. Throw light on the functions of Governing system.

9. Is there any incentive to work and development in society under Marxism.

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B.Tech. (AI&ML/DS/CS&E/CS/ECE/CSD/ Robotics & Artificial Intelligence/ Internet of Things and Cyber Security including Block Chain Technology) (Sem.–3)

PHILOSOPHY

Subject Code : HSMC102-18

M.Code : 77082

Date of Examination : 10-01-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
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SECTION-A

1. Write briefly :

a) What are Heterodox Schools of Indian Philosophy?

b) What is Knowledge according to Greek Philosophy?

c) What is Siksha Valli?

d) What is main content of Brihadaranyaka Upanishad?

e) What is the Socratic's method of Knowledge?

f) What is Sphota?

g) What is the meaning of Gita?

h) What is Tantrayuktis?

i) What is Self?

j) Who was Vyasa?

SECTION-B

2. Discuss the different between Knowledge and Ignorance.

3. Describe invention as a class of knowledge.

4. *Knowledge is power or self realization or both*. Describe on the basis of Bhagvad Gita.

5. What are the tools of acquiring knowledge according to Kautilya?

6. Describe Self according to the Upanishads.

SECTION-C

7. Describe knowledge basis as the sources of Vidya according to Indian System.

8. Describe knowledge about moral and ethical codes of conduct.

9. Discuss the different methods of knowledge according to tradition of Western Philosophy.

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B.Tech.(CSE / AI & DS / AI & ML / Block Chain / Cyber Security / DS / Robotics & Artificial Intelligence / Internet of Things and Cyber Security including Block Chain Technology) (Sem.–3)

DATA STRUCTURE & ALGORITHMS

Subject Code : BTCS-301-18

M.Code : 76436

Date of Examination : 02-01-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

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SECTION-A

1. **Write briefly:**

a) What is time and space complexity? Give suitable example of each.

b) What is Big O notation? Give the Big O of inserting an element in a linear array.

c) Given sorted array with 32 elements find the time complexity in worst case (in term of number of comparisons) for linear search, and binary search algorithm.

d) Give any two applications of stack data structure.

e) What is Big O for enqueue (), dequeue(), isempty(), isfull() operations for array implementation of circular queue?

f) Give any two advantages of doubly linked list over single linked list.

g) What is the advantage of using AVL tree over binary search tree?

h) Give the worst case time complexity (as Big O) for bubble sort, heap sort, selection sort and merge sort.

i) Give adjacency list and adjacency matrix representations of graph data structures.

j) Define complete graph, strongly connected graph.

SECTION-B

2. Draw the binary search tree of the following 14,10,17,12, 11, 20, 12, 18, 25, 28, 22, 23 Delete the item say 20 from binary search tree and give the whole solution step by step diagrammatically.

3. Find the time complexity of the following code and mention it in Big O

```
int fun(int n)
{
    int count = 0;
    for (int i = n; i > 0; i /= 2)
        for (int j = 0; j < i; j++)
            count += 1;
    return count;
    }
```

4. Write an algorithm to remove second last occurrence of an item from single linked list.

5. The keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function h(k) = k mod 10 and linear probing. What is the resultant hash table (also show intermediate tables)?

6. Suppose you are given an implementation of a queue of integers. The operations that can be performed on the queue are :

   a) isEmpty (Q) — returns true if the queue is empty, false otherwise.

   b) delete (Q) — deletes the element at the front of the queue and returns its value.

   c) insert (Q, i) — inserts the integer i at the rear of the queue.

   Consider the following function :

```
void f(queue Q){
int i;
if (!isEmpty(Q)) {
    i = delete(Q);
    f(Q);
    insert(Q, i);
    }
}
```

What operation is performed by the above function f()? Give step by step explanation with suitable example.

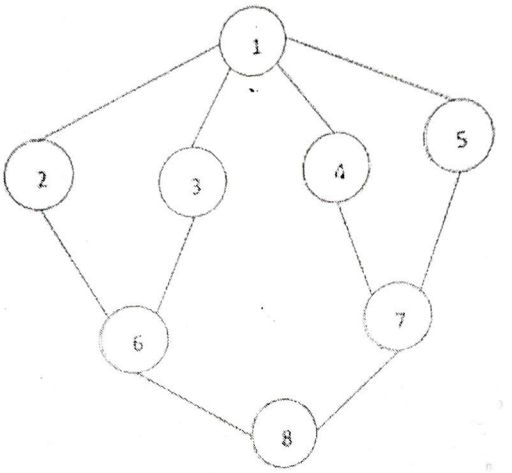
SECTION-C

7. Using the algorithms first convert infix to postfix and then evaluate postfix (give the step by step solution) for evaluating the following expression P.

P: (12/(7-3)) + (1 + 5)*2

8. Illustrate the execution of heap sort (in increasing order) in the sequence 3, 6, 17, 5, 1 l, 23, 38, 19, 26, 14.

9. What is DFS and BFS traversal of graph? Give the DFS and BFS traversal (starting with node 1) of graph. Show all intermediate steps.



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B.Tech. (AI &ML/ CSE/ Data Science/ IOT/ Internet of Things and Cyber Security including Block Chain Technology) (Sem.–3)

MATHEMATICS-III

Subject Code : BTAM304-18

M.Code : 76438

Date of Examination: 23-12-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

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SECTION-A

1. **Solve the following:**

a) Examine for maxima and minima $f(x, y) = x^2 + y^2 - 2(x + y)$.

b) Change order of integration for $\int_{y=0}^{1}\int_{x=y}^{\sqrt{2-y^2}} f(x, y)\, dxdy$.

c) State Cauchy convergence criterion.

d) Using Cauchy's root test, discuss convergence of $\sum\left(1 + \frac{1}{n}\right)^{-n^2}$.

e) State Leibnitz test for alternating series.

f) Define integrating factor. Is it unique for a given differential equation? Justify.

g) Solve $y = px + \cot^{-1} p$.

h) Solve $y \sin 2x dx - (1 + y^2 + \cos^2 x)dy = 0$.

i) Solve $(D^4 - 25)y = 0$.

j) Solve $(x+1)^2 y'' - (x+1)y' + y = 0$.

SECTION B

2. If $\Theta = t^n e^{-r^2/4t}$, what value of n will make $\frac{1}{r^2}\frac{\partial}{\partial r}\left(r^2 \frac{\partial \Theta}{\partial r}\right) = \frac{\partial \Theta}{\partial t}$.

3. Test for convergence the series $\sum \frac{(n!)^2}{(2n)!} x^{2n}$.

4. Discuss uniform convergence of $\sum \frac{\cos nx}{n^p}, (p>0)$.

5. Solve $xy(1+xy^2)\frac{dy}{dx} = 1$.

6. Using the method of variation of parameters, solve $\frac{d^2y}{dx^2} + 4y = \tan 2x$.

SECTION-C

7. Find the volume of the ellipsoid $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$.

8. Solve : $y = 2px + y^2p^3$.

9. Solve : $x\frac{d^2y}{dx^2} - 2\frac{y}{x} = x + \frac{1}{x^2}$.

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OBJECT ORIENTED PROGRAMMING

Subject Code : BTCS302-18

M.Code : 76437

Date of Examiantion:18-12-2024

Max. Marks : 60

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SECTION-A

1. **Write briefly:**

a) Explain the typical structure of a C++ program.

b) What is an array?

c) What is Destructor? How is it defined?

d) What are static data members?

e) Discuss the uses of public, private and protected access specifiers in a class.

f) Give the order of calling of constructors under inheritance.

g) Are virtual functions inherited?

h) What is an abstract class?

i) When do we use multiple catch handlers?

j) Discuss the use of ifstream and ofstream classes for file input and output.

SECTION-B

2. Explain various types of operators in C++ language.

3. How do you achieve operator overloading using friend function?

4. Discuss different visibility modes to derive a class for inheritance.

5. Explain the concept of early binding and late binding in detail.

6. Explain the process of open, read, write and close files in C++.

SECTION-C

7. a) **Explain the following with examples:**

   i) Inline functions

   ii) Class and Objects

   b) Explain various types of Constructors with examples.

8. What do you mean by Inheritance? What is the need of Inheritance? Explain various types of Inheritance with the help of suitable examples.

9. a) What is a virtual function? Why it is used? Explain with suitable example.

   b) What is exception handling in C++ programming? Explain the exception handling mechanism.

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