Reg. No. : ....

Name : ....

Second Semester B.C.A. Degree Examination, July 2017
(Career Related First Degree Programme Under CBCSS)
Group – 2(b)
Core Course
CP 1242 : OBJECT ORIENTED PROGRAMMING
(2013 Admn.)

Time : 3 Hours

Max. Marks : 80

SECTION – A

(Very Short Answer Type)

One word to maximum of one sentence. Answer all questions.　　　(10×1=10 Marks)

1. What is a class ?

2. What is an abstract class ?

3. What are static variables ?

4. What is static data member ?

5. What is static binding ?

6. What is stream ?

7. Define a destructor.

8. Show how an argument to a function is declared as constant.

9. Mention the memory management operators and commonly used I/O manipulators.

10. What is the use of scope resolution operator ?

SECTION – B

(Short Answer)

Not to exceed **one** paragraph. Answer **any eight** questions. **Each** question carries **two** marks. **(8×2=16 Marks)**

11. What is the significance of access specifiers in a class ?

12. Explain the difference between prefix and postfix incremental operator.

13. Write short notes on operator overloading.

14. What's the order that local objects are destructed ?

15. What do you mean by new and delete operator ?

16. When should one use references, and when should I use pointers ?

17. Can I overload the destructor for my class ? Support your answer.

18. Differentiate between macros and functions.

19. What is a friend function ? "Use of friend function and encapsulation are contradictory" – Comment critically.

20. What is function overloading ? Explain with an example.

21. When do we make a virtual function "public" ? What are the implications of making a function pure virtual function ?

22. Explain nesting of classes.

SECTION – C

(Short Essay)

Not to exceed **120** words. Answer **any six** questions. **Each** question carries **four** marks. **(6×4=24 Marks)**

23. What is copy constructor ? Illustrate with proper example.

24. What are some advantages/disadvantages of using friend functions ?

25. Differentiate b/w friend and member function.

26. Write a C++ program to count the number of words in a given file. Note the words could be separated by single or multiple white spaces (White space is a blank space or a tab or a new line).

27. Bringout the difference between classes and structures in C++.

28. Explain with the help of suitable example the difference between function overloading and function over-riding.

29. Write short note on multilevel and multiple inheritances.

30. Explain with example about constructor overloading in C++.

31. Write a program to reverse a string using recursion.

SECTION – D

(Long Essay)

Answer **any two** questions. **Each** question carries 15 marks.   **(2×15=30 Marks)**

32. What do you mean by object-oriented programming ? Discuss the different properties of an object-oriented programming.

33. Explain with the help of suitable example the difference between function overloading and function over-riding.

34. Write a program in C++ to create and delete a student record from a student's database and display the remaining records using file sharing.

35. How can we distinguish b/w prefix and postfix nature while overloading the unary ++ operator ? Write a program to overload the new operator. When do we use the protected visibility specifier to a class member ? What are the advantages of using 'new' operator over malloc () ? What is runtime polymorphism ?

Reg. No. : ....

Name : ....

Second Semester B.Sc./B.C.A. Degree Examination, July 2017
Career Related FDP Under CBCSS
Group 2(b) : Computer Science/BCA
CS 1221/CP 1241 : ENVIRONMENTAL STUDIES
(2015 Admission)

Time : 3 Hours   Max. Marks : 80

SECTION – A
(Very Short Answer type)

One word to maximum of **one** sentences. Answer **all** questions.   (10×1=10 Marks)

1. What is ecological succession ?

2. Name the first National Parks in India.

3. Brundtland Commission report is known as

4. Name any two invasive species in India.

5. What is ecotone ?

6. What do you mean by endangered species ?

7. Environmental Protection Act enacted on _____

8. The Convention on Biological Diversity (CBD) held at _____ on _____

9. World Water Day is celebrating on _____ of every year.

10. The highest per capita emitter of Carbon dioxide in the world is _____

SECTION – B

(Short Answer)

Not to exceed **one** paragraph. Answer **any eight** questions. **Each** question carries **two** marks.
(8×2=16 Marks)

11. What is value based education ?

12. Explain the role of afforestation in waste land reclamation.

13. Write a note on abiotic factors of an ecosystem.

14. Explain about the energy flow in ecosystem.

15. What do you mean by carbon footprint ?

16. Differentiate the levels of biodiversity with examples.

17. Write a note on solar energy.

18. Which are the anthropogenic sources of soil pollution ?

19. Briefly explain the environmental ethics.

20. What do you mean by Invasive Alien Species ?

21. Differentiate between food web and food chain.

22. Explain about industrial waste management.

SECTION – C

(Short Essay)

Not to exceed **120** words. Answer **any six** questions. **Each** question carries **four** marks.
(6×4=24 Marks)

23. Write a note on nuclear holocaust.

24. Write a note on the legal aspects of biodiversity conservation in India.

25. Briefly explain the main causative factors of habitat loss.

26. Briefly narrate about watershed based water conservation.

27. Explain how human rights enable the protection of environment.

28. Describe the impacts of noise pollution.

29. Briefly explain about the biodiversity of Kerala.

30. Write a note on poaching of wildlife and its consequences.

31. Write a note on Urban Solid Waste Management.

SECTION – D
(Long Essay)

Answer any two questions. Each question carries 15 marks.   (2×15=30 Marks)

32. Explain about Sustainable Development.

33. Write an essay on Solid waste management with suitable examples.

34. Explain about the causes and impacts of air pollution.

35. Briefly explain about renewable and non-renewable natural resources with suitable examples.

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(Pages : 3)

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Reg. No. : ....

Name : ....

Second Semester B.C.A. Degree Examination, July 2017
(Career Related First Degree Programme under CBCSS)
Group 2 (b)
COMPLEMENTARY COURSE
MM 1231.9 : Mathematics
(2013 Admn. Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – I

All the first 10 questions are **compulsory**. Each question carries **one** mark. Answer in **one** word to maximum of **two** sentences :

1. What is meant by a direct proof ?

2. Give the conjunction of the two statements : He is tall. He is intelligent.

3. Define the power set of a set A.

4. Let A = {1, 2, 3} and R = {(1, 2), (2, 3), (1, 3)} be a relation on A. Write the inverse relation of R.

5. If $f : N \to N$ and $g : N \to N$ are defined by $f(x) = x^2$ and $g(x) = 2^x$ then write the rule that defines the composition $f \circ g$ of f and g.

6. Give an example of a non-abelian group.

7. What is the Hamming distance between $x = (1\ 1\ 1\ 0\ 0)$ and $y = (0\ 1\ 0\ 1\ 1)$?

8. Draw a 3-regular graph.

9. What are the entries along the main diagonal of the adjacency matrix of a graph having no loops ?

10. Write the concatenation of the strings $x = 1\ 0\ 0\ 1$ and $y = 0\ 0\ 1$. **(10×1=10 Marks)**

SECTION – II

Answer **any 8** questions from among the questions **11 to 22**. They carry **two** marks **each**.

11. What is meant by a tautology ? Illustrate with an example.

12. Construct the truth table for the Boolean expression $(\neg p \vee q) \wedge (\neg q \vee p)$.

P.T.O.

13. Define disjunctive normal form and obtain it for $P \wedge (P \rightarrow Q)$.

14. If A, B, C are any three sets, prove that $(A \cap B) \cup C = (A \cup C) \cap (B \cup C)$.

15. Give an example with justification to show that the law of contradiction is violated by fuzzy subsets.

16. Define a partially ordered set and give an example.

17. Show that the identity element of a group is unique.

18. Let A = {a, b, c, d, e} and let R = {(a, a), (a, b), (b, c), (c, e), (c, d), (d, e)} be a relation on A. Find the relation R^2.

19. Show that the function $f : Z \rightarrow Z$ defined by $f(x) = 2x - 1$ is one-one. Is it onto ? Justify your answer.

20. Define adjacency matrix of a graph and illustrate with an example.

21. Define spanning tree of a graph G. Illustrate with an example.

22. Give the formal definition of a grammar. **(8×2=16 Marks)**

SECTION – III

Answer **any 6** questions from among the questions **23** to **31**. They carry **four** marks **each**.

23. Prove by induction that for all $n \in N$, $n \geq 0$ 6 divides $n^3 - n$.

24. Show that the propositions $\neg(p \wedge q)$ and $\neg p \vee \neg q$ are logically equivalent.

25. Obtain the conjunctive normal form of $\neg(P \vee Q) \Leftrightarrow (P \wedge Q)$.

26. Show that the transitive closure of a relation R is the set
S = {(a, b) : there is a walk from a to b in R}.

27. Let n be a fixed positive integer. Prove that the congruent modulo n is an equivalence relation on the set of integers.

28. Let G be the set of all real numbers except -1. Define $*$ on G by $a * b = a + b + ab$. Prove that $(G, *)$ is a group.

29. Define a ring and give an example.

30. Prove that in any graph the number of vertices of odd degree is even.

31. Prove that a tree with n vertices has $n - 1$ edges. **(6×4=24 Marks)**

SECTION – IV

Answer **any** 2 questions from among the questions **32** to **35**. They carry **15** marks **each**.

32. a) Give the recursive definition of Fibonacci numbers F_n. Prove by induction that for all $n \geq 0$, $\sum_{i=0}^{n} F_i^2 = F_n F_{n+1}$.

    b) Prove that $p \vee (q \wedge r)$ and $(p \vee q) \wedge (p \vee r)$ are logically equivalent.

33. a) Prove that an equivalence relation defined on a nonempty set A gives rise to a partition of A. Also prove that any partition of A determines an equivalence relation R such that the members of the partition are the equivalence classes defined by R.

    b) Determine the equivalence clases of the relation congruent modulo 4 on the set of integers.

34. a) Explain Warshall's algorithm with a suitable example.

    b) Explain in detail the need for error correction in codes.

35. a) Let G be a group and let a, b, c be elements of G. Prove that
       i) $ab = ac \Rightarrow b = c$
       ii) $(ab)^{-1} = b^{-1} a^{-1}$.
       iii) The equation $ax = b$ has unique solution in G.

    b) Explain breadth-first search algorithm with a suitable example.

(2×15=30 Marks)

Reg. No. : ....

Name : ....

Second Semester B.Sc./B.C.A. Degree Examination, July 2017
Career Related FDP Under CBCSS
Group 2(b) : Computer Science / Computer Applications
CS 1241/CP 1243 : DATA STRUCTURES
(2014 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – A
[Very Short Answer type]

One word to maximum of **one** sentence, Answer **all** questions.   **(10×1=10 marks)**

1. What is an array ?

2. Give any one application of linked list.

3. What is stack ?

4. What is the advantages of postfix notation ?

5. What is a linear data structure ?

6. What do you mean by an expression tree ?

7. What do you mean by complexity of an algorithm ?

8. What do you mean by hashing ?

9. What do you mean by a walk in a graph ?

10. Define DFS.

SECTION – B
(Short Answer)

Not to exceed **one** paragraph. Answer **any eight** questions. **Each** question carries **two** marks.   **(8×2=16 marks)**

11. How will you pass structures as arguments to functions ?

12. What is a linked list ? How will you add a node at the end of a singly linked list ?

13. What is the difference between doubly and circular linked list ?

14. Write an algorithm to evaluate postfix expression using a stack.

15. Differentiate between Polish and Reverse polish notations with suitable examples.

16. Explain dequeue, in brief.

17. Differentiate between level and depth of a tree, with suitable examples.

18. What do you mean by a complete binary tree ? Give an example.

19. Write an algorithm to perform binary search.

20. Explain linear hashing.

21. Write an algorithm for insertion sort.

22. Write short note on graphs and its applications.

SECTION – C
(Short Essay)

Not to exceed **120** words. Answer **any six** questions. **Each** question carries **four** marks.   **(6×4=24 marks)**

23. Write an algorithm to append two arrays into a single array.

24. What are the advantages of dynamic data structures ? How will you represent a polynomial using a linked list ?

25. Write an algorithm to perform PUSH and POP operations in a stack.

26. How will you perform insertion and deletion in a queue ? Explain.

27. Explain doubly linked lists in detail.

28. Explain binary tree traversal algorithms ?

29. Explain collision handling techniques in hashing, in detail.

30. Write an algorithm to perform selection sort.

31. How will you perform breadth first search in a graph ? Explain.

SECTION – D
(Long Essay)

Answer **any two** questions. **Each** question carries **fifteen** marks.   **(2×15=30 marks)**

32. What is double hashing ? Explain with suitable example.

33. Write program snippets for implementing the following :
    a) Insert a node into a binary tree, using pointers.
    b) Search a node from a binary tree, using pointers.
    c) Delete a node from the binary tree, using pointers.
    d) In-order binary tree traversal, using pointers.

34. Write program snippets for implementing the following operations on linked list : insertion, deletion and traversal.

35. Define a graph. What are the different representations of a graph ? Find breadth-first and depth-first search traversal for the following graph.
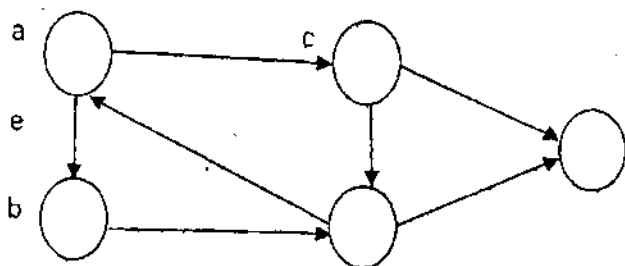
Second Semester B.Sc./B.C.A. Degree Examination, July 2017
Career Related FDP under CBCSS
Group 2(b)
COMPUTER SCIENCE/COMPUTER APPLICATIONS
Core Course
CS 1242/CP 1242 : Object Oriented Programming
(2014 Admission)

Time : 3 Hours   Max. Marks : 80

SECTION – A
(Very Short Answer)

One word to maximum of **one** sentence. Answer **all** questions :   (10×1=10 Marks)

1. What are dynamic objects ?

2. What are destructors ?

3. What are the exceptions ?

4. What is meant by early binding ?

5. What are the static members ?

6. What is encapsulation ?

7. What are the objects ?

8. What is inheritance ?

9. What are dynamic objects ?

10. What is abstraction ?

SECTION – B
(Short Answer)

Not to exceed **one** paragraph. Answer **any eight** questions. **Each** question carries
two marks.   (8×2=16 Marks)

11. What is the general structure of C++ programmes ?

12. What is reference variable ?

13. What are default arguments ? Give an example.

14. What is the use of new operator ?

15. What is meant by copy constructor ?

16. What is meant by EOF ?

17. What are inline functions ? .

18. What are the use of :: operators ?

19. What are the advantageous of C++ over C ?

20. What is recursive function ?

21. Why static members are known as class variables ?

22. Explain the concept of object oriented programming.

SECTION – C
(Short Essay)

Not to exceed **one** paragraph. Answer **any six** questions. **Each** question carries
four marks.   **(6×4=24 Marks)**

23. Explain insertion and extraction operators in C++ with example.

24. What do you mean by reference variables ?

25. Explain derived class in C++.

26. Differentiate between structure and class.

27. Compare call by value and call by reference with suitable example.

28. Explain polymorphism with suitable programme.

29. Explain function overloading with example.

30. Differentiate early binding and late binding with examples.

31. Explain the concept of friend function with program.

SECTION – D
(Long Essay)

Not to exceed **one** paragraph. Answer **any two** questions. **Each** question carries
fifteen marks.   **(2×15=30 Marks)**

32. Write a C++ program to find the sum of two matrices by operator overloading.

33. What are the different type of inheritance in C++ ? Explain each one with suitable examples.

34. Explain how polymorphism is achieved at compile time and run time.

35. Write a program containing a possible exception. Use a try block to throw it and a catch block to handle it properly.