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A – 5298

Reg. No. :

Name :

Second Semester B.C.A. Degree Examination, July 2016
(Career Related First Degree Programme under CBCSS)
Group – 2(b) : Complementary Course
MM 1231.9 : MATHEMATICS – II
(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – I

Answer **all** questions. **Each** question carries **1** mark. Answer in **one** word to a maximum of **two** sentences.

1. Give the truth table for the disjunction of two propositions p and q .
2. Determine the contra-positive of 'If John is a poet, then he is poor'.
3. Draw the Venn diagram for the difference $A - B$ of two sets A and B .
4. Find $A \times B$ when $A = \{1, 2, 3\}$ and $B = \{5, 6\}$.
5. Give a relation which is reflexive and transitive but not symmetric.
6. Give an example of a semi group, which is not a monoid.
7. Give an example of an abelian group with 4 elements.
8. What is the maximum degree of any vertex in a graph with n vertices.
9. Under what conditions on m and n is the complete bipartite graph $K_{m,n}$ a regular graph?
10. Give an example of a graph which is Eulerian but not Hamiltonian.

SECTION – II

Answer **any eight** questions (11 – 22). **Each** question carries **2** marks.

11. What is meant by tautology? Give an example.
12. Define a Boolean expression with an example.

P.T.O.



13. Check whether the statements $(\sim p) \vee q$ and $p \rightarrow q$ are equivalent.
14. Find relation $R = \{(a, b) : a \leq b\}$, defined on the sets $A = \{1, 3, 4, 5\}$ and $B = \{3, 6\}$.
15. State the properties of an equivalence relation. Give an example.
16. Draw the Hasse diagram for divisibility on the set $\{1, 2, 3, 4, 6, 8, 12\}$.
17. Show that each element of a group G has only one inverse in G .
18. G is a group with identity e . Show that if $a^2 = e$ for all a in G , then G is abelian.
19. Prove that the set of natural numbers is not a ring with addition and multiplication.
20. Show that the total of edges in a complete graph with n vertices is $n(n-1)/2$.
21. Define the adjacency matrix with an example.
22. Is K_8 an eulerian graph? Justify your answer.

SECTION – III

Answer any six questions (23 – 31). Each question carries 4 marks.

23. Find the principal disjunctive normal form for $f(x, y, z) = xy + x'yz + yz'$.
24. Construct a truth table for the compound proposition $(p \rightarrow q) \rightarrow r$.
25. If $f : \mathbb{Q} \rightarrow \mathbb{Q}$ be defined by $f(x) = 3x + 4$, $x \in \mathbb{Q}$, the set of all rational numbers, find the inverse mapping. Also find $f^{-1}(7)$.
26. Let R be the set of all real numbers. Find $f \circ g$ and $g \circ f$ for $f : R \rightarrow R$ given by $f(x) = 3x^2 + 2x$ and $g : R \rightarrow R$ given by $g(x) = x - 1$.
27. Show that if every element of a group G is its own inverse, then G is abelian.
28. Define the union and intersection of two fuzzy sets A and B with suitable examples.
29. Show that a tree with n vertices has $(n - 1)$ edges.
30. Define a binary tree. Give an example.
31. Define a ring with an example.



SECTION – IV

Answer **any two** questions (32 – 35). Each question carries **15** marks.

32. a) Test the validity of the argument :

“If you invest in the stock market, then you will be getting rich. If you get rich, then you will be happy. Therefore, if you invest in the stock market, then you will be happy”.

b) Prove by induction that $3^{4n+2} + 5^{2n+1}$ is divisible by 14 for each positive integer n.

33. a) On the set of rational numbers, a relation is defined by $x R y$ if $xy > 0$. Is it an equivalence relation ? Justify your answer.

b) Explain Warshall's algorithm.

34. a) State and prove De Morgan's laws in set theory.

b) Explain the need of error correction in codes.

35. a) Explain breadth – first search algorithm with a suitable example.

b) Write a note on shortest path problem.



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A – 5334

Reg. No. :

Name :

Second Semester B.Sc./B.C.A. Degree Examination, July 2016

Career Related FDP under CBCSS

Group 2 (b)

Computer Science/Computer Applications

Core Course

CS 1242/CP 1242

OBJECT ORIENTED PROGRAMMING

(2014 Admission Onwards)

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 cascading of I/O operators ?
2. What are the static members ?
3. What are the exceptions ?
4. What is symbolic constant ?
5. What are tokens ?
6. What are local classes ?
7. What is inheritance ?
8. What is destructor ?
9. What are dynamic objects ?
10. What is constructors ?

P.T.O.



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 reference variable ?
12. Describe major parts of a C++ program.
13. Why do we need the preprocessor directive # include<iostream> ?
14. How does a main () function in C++ differ from main () in C ?
15. What are in-line functions ?
16. What are the applications of void data type in C++ ?
17. What is meant by copy constructor ?
18. How does this two statements are differ ? char*const P, char const *P.
19. Why array is called derived data type ?
20. What do you mean by dynamic initialization ?
21. What is recursive function ?
22. Why static members are known as class variables ?

SECTION – C
(Short Essay)

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

23. Explain the concept of object oriented programming.
24. What do you mean by dynamic binding ? How it is useful in OOP ?
25. What do you mean by reference variables ?
26. Describe inheritance as applied to OOP.



27. How does an in-line function differ from a preprocessor macro ?
28. What are the advantageous of call by value and call by reference ?
29. Explain polymorphism with suitable programme.
30. What do you mean by overloading of a function ?
31. What is a friend function with program ? What are the merit and demerit of using friend function ?

SECTION – D
(Long Essay)

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

32. What is operator overloading ? Why is it necessary to overload an operator ?
 33. What are the different type of inheritance in C++ ? Explain each one with suitable examples.
 34. Write a C++ program to find the product of two matrices by operator overloading.
 35. Explain with suitable program how polymorphism is achieved at compile time and run time.
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