

MCA/ Sem-I (CBSGS)/ Object Oriented Programming/ May-17

Q.P. Code :02538

[Time: Three Hours]

[Marks:80]

Please check whether you have got the right question paper.

- N.B:
1. Question.No.1 is Compulsory.
 1. Answer any Four from Question No.2 to Question No.7.
 2. All questions carry equal marks.

- Q.1 a) What is Operator Overloading? Write a Program in C++ to overload Subscript [] operator. 10
- b) Design a Class Cricketer with appropriate attributes and methods. Create an array of Cricketer objects and show the details of each cricketer. 10
- Q.2 a) Explain use of Static and Constant keyword in C++ with a suitable program. 08
- b) What are Strings? How will you crate strings in C++? Explain various functions available in built in String class. 07
- Q.3 a) What is Inheritance? Explain the need of inheritance with a suitable example. 08
- b) Explain use of try, throw and catch keywords with a suitable program. 07
- Q.4 a) What are Pure Virtual Functions? Explain their use with a suitable C++ program. 08
- b) What is Difference between a Text File and Binary File? How will you write and read data from a binary file using C++. 07
- Q.5 a) What are Function and Class Templates? Write a program to illustrate their use. 08
- b) What is Class? Explain different elements that can be added to class with a suitable program. 07
- Q.6 Write Notes on 15
- a) Inline functions
- b) Friend Functions
- c) Data types in C++
- Q.7 a) Explain use of public, private and protected keyword with an example. 08
- b) What are manipulators? Explain different types of manipulates. 07
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MCA/SEM-I(CBSGS) / Computer Org & Architecture
Q.P. Code : 03680

(3 Hours)

[Total Marks : 80

- N.B. : 1) Question No.1 is **compulsory**.
2) Attempt any **four** from the remaining **six** questions.
3) Answer to sub-questions should be grouped together.

1. (a) Explain working of Full Adder using logic diagram and truth table of Full Adder (05)
(b) Simplify the following expression using K-maps (05)
 $F(A,B,C,D) = \sum(1,7,10,13,14) + d(0,5,8,15)$
(c) Compare combinational circuit and sequential circuit (05)
(d) What is a synchronous counter? (05)
2. (a) Explain DMA and programmed I/O (07)
(b) Explain Instruction cycle state diagram (08)
3. (a) Give the hierarchy of memory. Explain cache memory organization. (07)
(b) Explain SRAM and DRAM using suitable diagrams (08)
4. (a) What is RAID? Explain at least four levels of RAID (07)
(b) Explain the data flow in fetch and interrupt cycle with diagrams (08)
5. (a) What are flip flops? Explain the construction and working of JK flip flop. (07)
(b) Explain Flynn's classification of parallel processors (08)
6. (a) Explain different superscalar instruction issue policies (07)
(b) Draw and explain I/O module using block diagram (08)
7. Write Short Notes on any three :- (15)
 - (a) 8:1 Multiplexer
 - (b) Micro programmed and Hard wire control
 - (c) Register organization
 - (d) System Bus

Q.P. Code :01601

[Time: - 3 Hours]

[Marks: 80]

Please check whether you have got the right question paper.

- N.B: 1. Question No. 1 is compulsory.
2. Attempt any four questions from remaining six questions.

1. a) Explain RAD model and its advantages 10
b) Explain Formal Technical Review in detail. 10
2. a) An application has the following: 10 low external inputs,
12 high external outputs
20 low internal logical files,
15 high external interface files,
12 average external inquiries,
And a value of complexity adjustment factor of 1.10
What are the unadjusted and adjusted function point counts? 08
b) Explain degree of rigor explain how TSS is calculated based on it. 07
3. a) Define activity network diagram and explain difference between activity diagram and Gantt chart. 08
b) Describe Corrective, Adaptive and Preventive type of software maintenance. 07
4. a) What is feasibility study, explain in detail. 08
b) What are structured walkthrough and how are they carried out? 07
5. a) Explain CPM with an example. 08
b) Explain Warnier Orr diagram and its advantages. 07
6. a) Discuss Software Requirement Specification (SRS) 08
b) Explain in brief relationship between People and effort. 07
7. Write short notes on following: (Any 3) 15
 - a) Structured Analysis
 - b) Data Dictionary
 - c) HIPO chart
 - d) Reliability Metrics

Q.P. Code :04463

[Time: Three Hours]

[Marks:80]

Please check whether you have got the right question paper.

- N.B:
1. Question No 1 is compulsory.
 2. Attempt any four questions out of remaining six questions.
 3. Assume necessary data but justify the same.
 4. Figures to the right indicate full marks.

- Q1 a) Obtain DNF of the following $(p \rightarrow q) \wedge (\sim p \wedge q)$ 05
- b) Find the solution of the recurrence relation $a_n = a_{n-1} + 2a_{n-2}$ with initial conditions $a_0 = 2, a_1 = 7$. 05
- c) Let $(G, *)$ be a given group show that the function $f: G \rightarrow G$ defined by $f(a) = a^2$ is homomorphism if and only if the group is abelian. 05
- d) Draw the directed graph and calculate In _ degree, out _ degree of the following relation R on $A = \{1, 2, 3, 4, 5, 6\}$ defined by $R = \{(1,1), (1,2), (2,2), (4,1), (6,2)\}$. 05
- Q2 a) Determine whether the following relation are reflexive, symmetric or transitive $A = \{1,2,3\}$ 08
- i. $R = \{(1,1), (2,2), (1,2), (2,1), (1,3)\}$
 - ii. $R = \{(1,1), (1,2), (2,1), (2,2), (3,3), (2,3), (3,1)\}$
- b) Find the transitive closure of R of the following by using Warshall's algorithm where $A = \{1,2,3,4\}$ and $R = \{(1,2), (1,3), (2,4), (3,2)\}$ 07
- Q3 a) Use the method of homogeneous solution and particular solution to solve $3a_0 = 5a_{n-1} - 2a_{n-2} + n$ with initial conditions $a_0 = -1, a_1 = 1$. 08
- b) Let $V = \{v_0, w, a, b, c\}$ $S = \{a, b, c\}$ and let \rightarrow be a relation on V^* given by $v_0 \rightarrow aw, w \rightarrow bbw, w \rightarrow c$ consider the phase structure grammar $G = (V, S, v_0, \rightarrow)$ derive the sentence ab^4c and ab^6c also draw the derivation trees. 07
- Q4 a) Check the validity of the following arguments
If Ram has completed MCA or MBA, then he is assured a good job.
If Ram is assured a good job, then he is happy.
Ram is not happy.
So, Ram has not completed MCA. 08
- b) Consider the following (3,8) encoding function $e: B^3 \rightarrow B^8$ defined by
- | | |
|---------------------|---------------------|
| $e(000) = 00000000$ | $e(001) = 10111000$ |
| $e(010) = 00101101$ | $e(011) = 10010101$ |
| $e(100) = 10100100$ | $e(101) = 10001001$ |
| $e(110) = 00011100$ | $e(111) = 00110001$ |
- How many error will e detect? 07

TURN OVER

Q.P. Code :04463

- Q.5 a) Let the state transition table for a finite state machine be

	0	1
S_0	S_0	S_1
S_1	S_1	S_2
S_2	S_2	S_3
S_3	S_3	S_0

List values of the transition function F_w for (i) $W = 01001$ (ii) $W = 11100$

- b) Prove by Mathematical Induction
 $5+10+15+20+\dots+5n = 5n(n+1)/2$
 For all natural number values of n .

- Q.6 a) For the cyclic group of order 8 with generator a , find the quotient group corresponding to the subgroups generated a^2 and a^4 respectively.

- b)
- Show that $(p \rightarrow (q \rightarrow r)) \rightarrow ((p \rightarrow q) \rightarrow (p \rightarrow r))$ is a tautology.
 - Show that $(p \rightarrow (q \vee r)) \equiv ((p \rightarrow q) \vee (p \rightarrow r))$

- Q.7 a) Consider the group $G = \{1, 2, 3, 4, 5, 6\}$ under multiplication modulo 7. Find multiplication table of G .
 Find 2^{-1} , 3^{-1} , 6^{-1} .

- b) Define group code, Show that $(2, 5)$ encoding function $e: B^2 \rightarrow B^5$ defined by $e(00)=00000$, $e(01) = 01110$, $e(10) = 10101$, $e(11) = 11011$ is a group code.