

MF (Comp) SEM 2 (old)
O.O.A.D.

May 2013
2015/13

ws-Con-2013-44

Con. 9290-13.

BB-6424

(3 Hours)

[Total Marks : 100

Note:

1. Question no. 1 is **Compulsory**.
2. Attempt any **four** questions out of remaining **six** questions.
3. Answers **must** carry formal UML Diagrams.
4. Make such **assumptions** that you need, justifying them **clearly**.

Q1. A) Design a simple online shopping portal. The site will provide a soothing shopping experience for customers. The system will allow more than one categories and different brands under the segment. The case will trace the following sequence.

- i) A customer visits the online shopping portal. A customer may buy item or just visit the page and logout. The customer can select a segment, then a category, and brand to get the different products in the desired brand
- ii) The customer can select the product for purchasing. The process can be repeated for more items. Once the customer finishes selecting the product/s the cart can be viewed, If the customer wants to edit the final cart it can be done here.
- iii) For final payment the customer has to login the portal, if the customer is visiting for the 1st time he must register with the site, else the customer must use the login page to proceed.
- iv) Final cart is submitted for payment and card details and address (where shipment has to be made) are be confirmed by the customer .Customer is confirmed with a shipment Id and delivery of goods within 15 days. Draw class diagram and activity diagram. [15]

B) Explain in short how does one properly identify the classes and their relationship that are relevant to particular problem? [5]

Q2. A) Explain Booch methodology and its development processes [10]

B) Draw component and interaction diagram for situation given in question no 1. [10]

Q3. A) Design software system for Hospital management, which maintain information related to patient, surgeons, and nurse, consultants (senior surgeons) (who has specialization) may have private patients who are assigned to private rooms. A patient may have no. of operations for which information has to be recorded. There will be waiting list of patients needing different treatment e.g. paediatric, maternity, surgical, and medical. The bed state should be determined and if beds are available, the next appropriate patients on the list notified. Nurses should be allocated to wards depending on ward sizes. Cast given situation and draw use case diagram? [10]

B) Explain elements of Object models in detail with example? [10]

[TURN OVER

Q4. A) What is the difference between aggregation, association and composition? Explain which one is the most general concept, which one is the most specific? [10]

B) Dolphin Books is an on-line cum in-shop book shop. Orders can be web based, phone based, or direct. Choice of deliveries is: direct, courier, and authorized bearer. Payment choices are cash, credit-card, and Cheque. It is proposed to add 'return-of-book' facility if the book is returned within ten days of delivery. Return payment is strictly by credit voucher. Draw deployment diagram? [10]

Q5. A) Explain the different stages of object oriented project scheduling and tracking? [10]

B) Explain the following with Example- [10]

i) State, Transition

ii) Conditional transition, Nested states, State action

iii) Orthogonal state, History states

Q6. A) What are benefits and risks of Object Oriented Development? [10]

B) What do you understand Management and planning of OO Projects? [10]

Q7. Write short note (any four) [20]

A) Multiple Polymorphism

B) Concurrency

C) Typing

D) OO Metrics

E) Object Oriented Testing

ME / COMP I (old) Algorithms & Complexity

VT-F.H.Exam. April(1)-13-151

Con. 7645-13.

BB-6415

(3 Hours)

[Total Marks : 100

N.B. : (1) Question No. 1 is **compulsory**.

(2) Attempt any **four** questions out of **remaining** questions.

(3) Assume **suitable** data if **necessary** and justify the **assumption**.

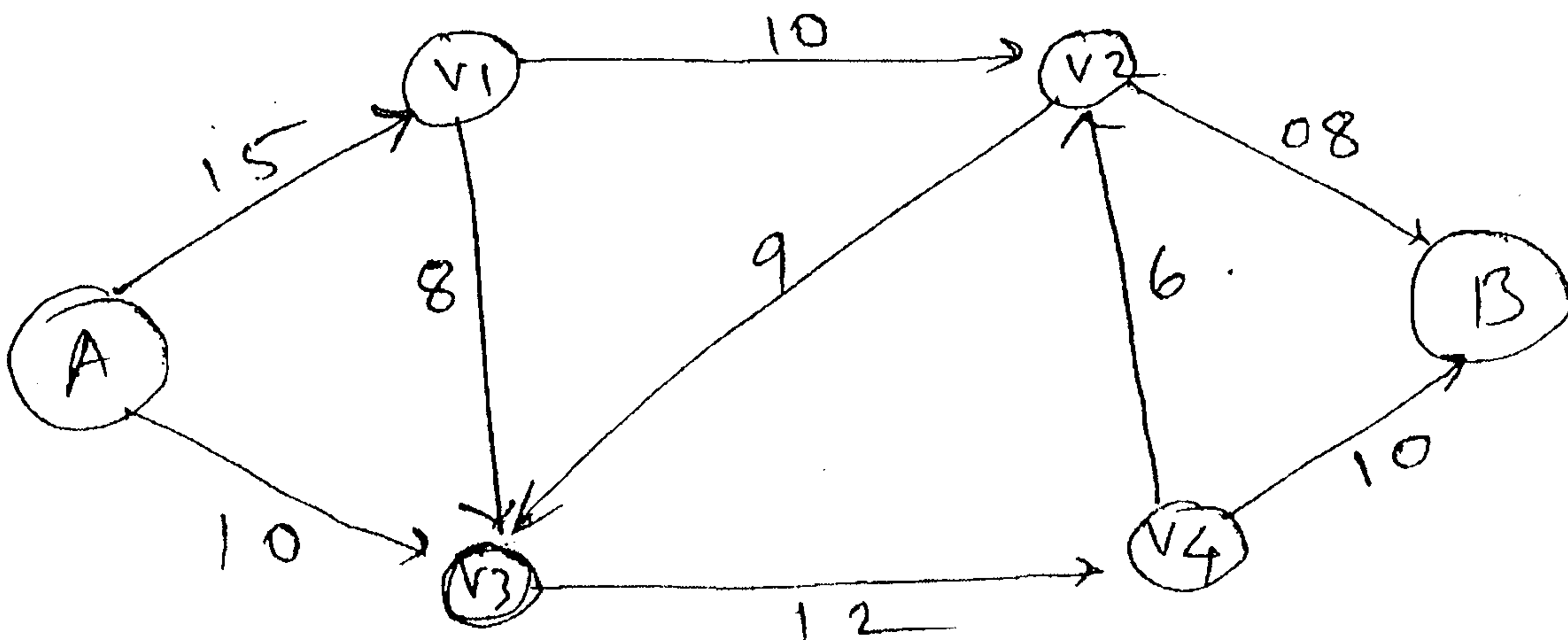
(4) **Figures** to the **right** indicates **full marks**.

- (a) Give R and A encryption algorithm consider a R and A key set with $p = 30$, $q = 10$, $n = 340$ and $e = 3$
What value of 'd' should be stored in secret key ? What is the encryption of the message $M = 200$?

(b) Write a function for Bubble sort and show computation of its space and time complexity. **10**
- (a) Compute longest common subsequence for $A = 0001110010$, $B = 1110110011$. **10**

(b) Discuss in detail the Bitonic Sorting technique. **10**
- (a) Prove that clique is NP - Complete. **10**

(b) Find the optimal parenthesization of a matrix-chain product whose sequence of dimension is $\langle 5, 10, 3, 5, 10, 30, 6 \rangle$. **10**
- (a) Find the maximum flow for the network given below. Give algorithm and complexity :- **10**



(b) Discuss in detail the various models of computation. **10**

[TURN OVER

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5. (a) Generate variable length Huffman Code for following set of frequencies :- **10**
a : 20, b = 10, c = 15, d : 5, e : 22, f : 3.
- (b) Insert following keys in a hash table of length 11. Show Collision resolution results **10**
using linear probing and quadratic probing with values $c_1 = 1$ and $c_2 = 3$.
Keys : 7, 10, 0, 3, 28, -5, 48, 99, 23, 53, 112.
6. (a) What is difference between dynamic and Greedy approach ? Explain **10**
manufacturing problem.
- (b) Explain RB-tree insertion algorithm with all cases. **10**
7. Answer any **four** out of the following :- **20**
- (a) Compare BFS and DFS Techniques
 - (b) Chinese remainder theorem
 - (c) Master method for recurrence
 - (d) Versions of Problem
 - (e) Greedy Algorithm
 - (f) Vertex-Cover problem.
