Total No. of Questions : 12]

P3721

SEAT No. :

[4961]-302

[Total No. of Pages : 2

S.Y. M.C.A. (Engineering)
DATABASE MANAGEMENT SYSTEM
(2013 Course) (Semester - III) (410902)

Time : 3 Hours]

may-16

Instructions to the candidates:

[Max. Marks : 50

1) *Neat diagrams must be drawn wherever necessary.*
2) *Figures to the right side indicate full marks.*
3) *Assume Suitable data if necessary.*

Q1) a) Write difference between DBMS and File Processing System. **[4]**

b) Explain System catalogs in detail. **[4]**

OR

Q2) a) Explain DBMS Architecture with proper diagram. **[4]**

b) Define: **[4]**

i) Data Abstraction.

ii) Data Independence.

Q3) a) Consider the scenario for "Courier service system" Make your own assumptions and Draw an EER consists of Aggregation, Generalization, Specialization. **[6]**

b) Explain different types of attributes with diagram notion and suitable example. **[4]**

OR

Q4) a) Explain Specialization & Generalization with suitable example. **[6]**

b) Explain different types of constraints that we can apply on the fields of the table. **[4]**

Q5) a) Explain view in detail. **[4]**

b) Write neat syntax of

i) Index

ii) Sequence **[4]**

OR

P.T.O.

Q6) a) Explain any four rules of E.F. Codd. [4]

b) Write short note on Referential Integrity with example. [4]

Q7) a) Explain different types of cursors with proper example. [4]

b) Explain any 4 aggregate functions with example. [4]

OR

Q8) a) Explain difference between stored procedure and function with example. [4]

b) Write short note on: Joins. [4]

Q9) a) Explain different Database Design approach. [4]

b) Explain types of Function dependency in detail. [4]

OR

*Q10)*a) Relation{ custno, custname, orderno, prodno, proddesc, qty_ordered, custaddress,date_+ordered, order_descr, qty_available, price_per_unit, total_cost}.

Normalize this relation upto 3NF with proper explanation. [4]

b) Explain different Anomalies and data redundancy issues with unnormalized data. [4]

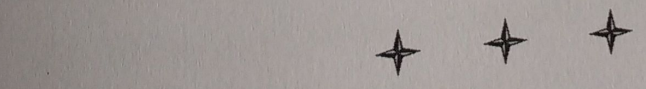
*Q11)*a) What are the benefits of BigData? Explain in detail. [4]

b) Explain HBASE Architecture. [4]

OR

*Q12)*a) What are the advantages of NOSQL over SQL? [4]

b) Write short note on: NONRelational Database Systems. [4]



Total No. of Questions :12]

P3723

SEAT No. :

[4961] - 304

[Total No. of Pages :3

S.Y. M.C.A. (Faculty of Engineering)

OBJECT ORIENTED ANALYSIS AND DESIGN

(Semester - III) (2013 Course) (410904) (Theory)

may-16

Time :3 Hours]

[Max. Marks :50

Instructions to the candidates:

1) *Neat diagrams must be drawn wherever necessary.*
2) *Figures to the right indicate full marks.*
3) *Assume suitable data, if necessary.*

Q1) a) Explain the concept of Booch Methodology. [4]

b) Explain in brief the phases of Rational Unified Process. [4]

OR

Q2) a) Explain the design view in 4 + 1 view architecture. [5]

b) Differentiate SSAD and OOAD. [3]

Q3) a) Explian the Extensibility mechanisms of UML. [5]

b) What is OCL? Explain with example. [3]

OR

Q4) a) Draw use case diagram for booking Online Movie Ticket. Make necessary assumptions. [5]

b) Explain the benefits of using UML. [3]

P.T.O.

Q5) a) The university has arranged a project competition for which students of MCA, MCS College students can register online in a group. The panels of Judges are invited from colleges of other Universities. The rules of the competition are as follows: [5]

i) One college can send any number of groups.

ii) One group can how minimum 2 and maximum 4 members.

iii) One group cannot develop more than one project.

iv) One student can participate in only one project group.

v) One panel of judges consists of minimum 2 and maximum 5 judges.

vi) One panel of judges can judge many project.

The University declares result passed on the points given by the panel of Judges. From the above assumption, Draw class diagram.

b) Explain the concept of Association and Aggregation with example. [4]

OR

Q6) a) Draw Class diagram for "Order Management System". Make necessary assumptions. [5]

b) Explain the concept of Object diagram with example. [4]

Q7) a) Draw sequence diagram for ATM machine. Make suitable assumption. [5]

b) Explain the term Interaction diagram. [3]

OR

Q8) a) Draw communication diagram for buying a product from vending system. Write suitable assumptions. [5]

b) Compare communication diagram and sequence diagram. [3]

Q9) a) Draw activity diagram for given order processing system where the firm receives the order. On receipt of order the order form is filled and simultaneously an invoice is sent. Once the order is filled, the delivery status is finalized. If the order is rush order the delivery is made overnight otherwise delivery is made in regular mode. The payment is received on invoice generation and order is closed. [5]

b) Explain the concept of Timing Diagram. [3]

OR

Q10) a) Draw activity diagram to resolve an issue in software design. Make suitable assumption. [5]

b) Explain the concept of State machine diagram. [3]

Q11) a) Explain component diagram with suitable example. [5]

b) Explain the application of UML. [4]

OR

Q12) a) Draw deployment diagram for web application - online ordering of book. Write your assumptions clearly. [5]

b) What is the use of package diagram? Explain with example. [4]

Total No. of Questions : 12]

P3724

SEAT No. :

[Total No. of Pages : 6

[4961]-305
S.Y.M.C.A. (Engg.)
OPERATION RESEARCH
(2013 Course) (Semester - III) (410905)

May-16

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) *Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *All questions are compulsory.*
4) *Figures to the right side indicate full marks.*
5) *Use of elctronic pocket calculator is allowed.*
6) *Assume Suitable data if necessary.*

Q1) a) Solve the following LPP by the Simplex method. **[6]**

Max $z = 11x_1+4x_2$

Subject to constraint

$7x_1+6x_2<=84$

$4x_1+2x_2<=32$

$x_1, x_2>=0$

b) Discuss the properties of LP model. **[3]**

OR

[3]

Q2) a) Explain

i) Slack Variable

ii) Feasible Solution

iii) Optimum Solution

P.T.O.

b) Solve the following LPP by the Graphical method. [6]

Max $z = 9x+13y$

Subject to constraint

$2x+3y<=18$

$2x+y<=10$

$x_1, x_2>=0$

Q3) Find basic feasible solution by using [8]

a) North West corner method

b) VAM

1	2	3	4	Supply
10	2	20	11	15
12	7	9	20	25
4	14	16	18	10

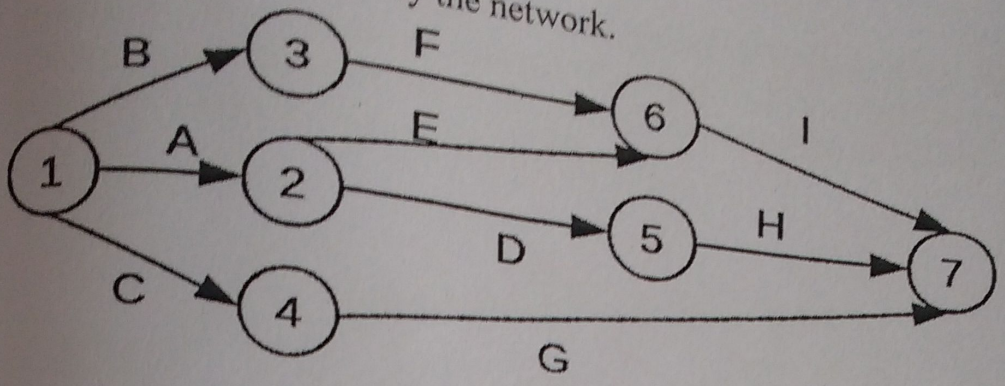
Demand 5 15 15 15

OR

Q4) Solve the given problem of Assignment using Hungarian method. [8]

	A	B	C	D
1	1	4	6	3
2	9	7	10	9
3	4	5	11	7
4	8	7	8	5

Q5) A project is represented by the network. [8]



Task	a	m	b
A	5	8	10
B	18	20	22
C	26	33	40
D	16	18	20
E	15	20	25
F	6	9	12
G	7	10	12
H	7	8	9
I	3	4	5

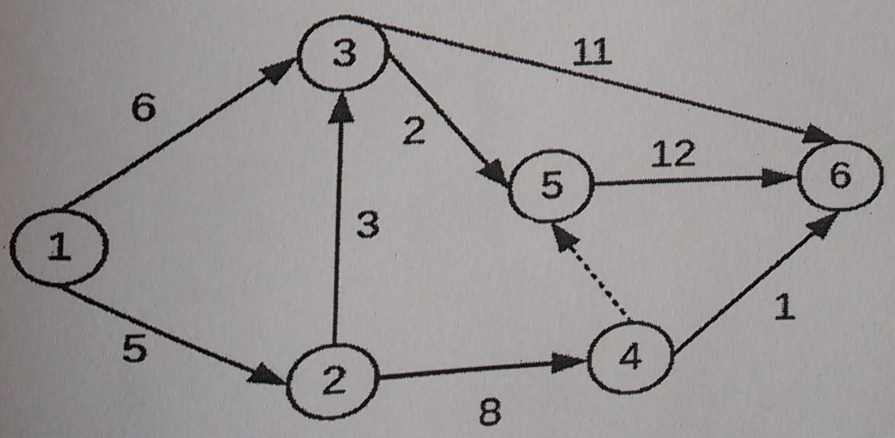
a) Determine Expected time & Variance

b) The critical path

c) The possibility of node occurring at the proposed completion date if the original contract time of the completing project is 41.5 weeks.

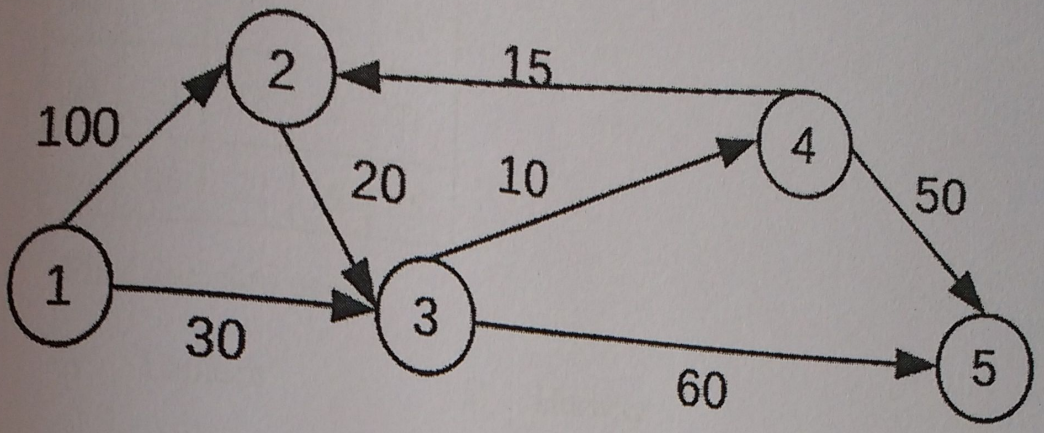
OR

Q6) Determine critical path for the project network using forward & backward pass. [8]



Q7) The network in following figure gives the permissible routes & their lengths in miles between city (node 1) and four other cities (nodes 2 to 5). Determine the shortest routes between city 1 and each of the reaming four cities. Find the shortest route using Dijkstra's algorithm.

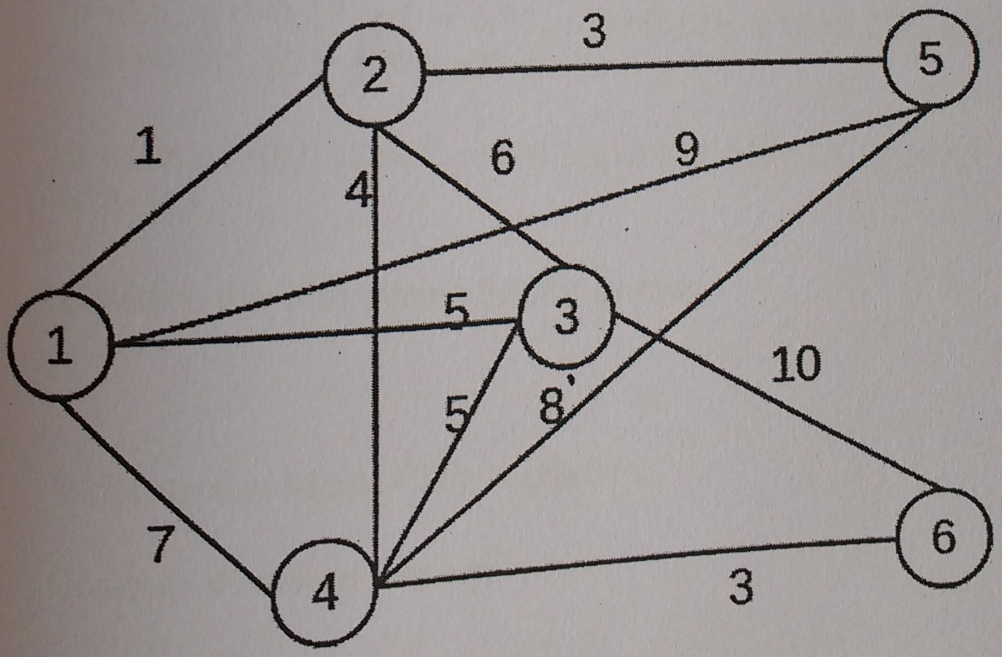
[9]



OR

Q8) Midwest TV cable company is in the process of providing cable service to 5 new housing development areas. The following figure depicts possible TV linkages among the 5 areas. The cable miles shown on each arc. Determine the most economical cable network. Draw minimum spanning tree & calculate shortest path.

[9]



Q9) a) What are the characteristics of decision making? [4]

b)

	s1	s2	s3	s4
a1	5	10	18	25
a2	8	87	12	23
a3	21	18	12	21
a4	30	22	19	15

[4]

Find decision using

i) Laplace

ii) Hurwicz

iii) Regret

iv) Maximin

OR

*Q10)*a) What is decision under risk? [4]

b) Suppose that following weights are specified for the simulation of Rahul & Rekha [4]

p=0.5, p1=0.17, p2 = 0.83, p11=0.129, p12=0.277, p13=0.594, p21=0.545, p22=0.273, p23=0.182

q = 0.5, q1=0.3, q2=0.7, q11=0.2, q12=0.3, q13=0.5, q21=0.5, q22=0.2, q23=0.3

Based on this information find the ranking.

*Q11)*a) Write steps in Monte Carlo simulation. [4]

b) Generate 4 random numbers [4]

b= 17, c= 111, m= 103, seed= 7

OR

Q12)a) A bakery keeps a stock of popular brand of coke. Previous experience shows that the daily demand pattern for the item with associated probabilities is given below.

Daily Demand	0	10	20	30	40	50
Probability	0.01	0.20	0.15	0.50	0.12	0.02

Simulate the demand for next 10 days. Also find the average demand/ day.

Random numbers- 25,39,65,76,12,5,73,89,19,49 **[6]**

b) What is simulation? What are the factors affecting simulation? **[2]**

x x x

Total No. of Questions :12]

P3722

SEAT No. :

[Total No. of Pages :3

[4961]-303
S.Y.M.C.A.(Engg.)
Operating System
(2013 Course) (Semester -III) (410903)

may-16

Time : 3 Hours *[Max. Marks :50]*

Instructions to the candidates:

1) *Neat diagrams must be drawn wherever necessary.*
2) *Figures to the right side indicate full marks.*
3) *Assume suitable data if necessary.*

Q1) a) What is Resource Preemption? Explain sequential sharing & concurrent sharing. **[4]**

b) What is Batch Processing system? Explain functions of batch monitor? **[4]**

OR

Q2) a) Explain Jobs, Programs and processes. What is the degree of Multiprogramming? **[4]**

b) Write a short note on real time operating system. **[4]**

Q3) a) Explain Process Control Block with diagram. **[4]**

b) Explain the difference between preemptive and non preemptive process scheduling with an example. **[4]**

OR

Q4) a) Explain Scheduling criteria. Name different Scheduling Algorithms. **[4]**

P.T.O.

b) Consider a set of processes P1, P2, P3 having priorities ranging from 1 to 3. Let us assume that 1 is the highest priority whereas 3 is the least priority. Let us also assume that p1 arrives first and P3 arrives in the last. [4]

Process	CPU BurstTime	Priority	Arrival
p1	10	3	0
p2	5	2	1
p3	2	1	2

Calculate average waiting time and turnaround time using preemptive priority scheduling. Draw Gantt chart

Q5) a) What is deadlock? Explain two fundamental approaches for handling deadlocks. [6]

b) Write a note on mutual exclusion. [3]

OR

Q6) a) Explain the concepts: [6]

i) Semaphores.

ii) Monitors.

iii) Race Conditions.

b) Explain characteristics of deadlock. [3]

Q7) a) Explain the concepts: [4]

i) Memory Fragmentation.

ii) Memory Compaction.

b) Write a short note on locality of reference. [4]

OR

Q8) a) State the page replacement policies. Explain LRU with example. [4]

b) Write a short note on Contiguous and Non-Contiguous memory allocation. [4]

Q9) a) Consider a disk system with 100 cylinders The request to access the cylinder occur in the following sequence : 4,34,10,7,19,73,2,15,6,20. Assuming the head is at cylinder 50, What is the total distance that disk moves to satisfy all the pending requests for the following disk scheduling algorithm:

i) SCAN. [6]

ii) FCFS.

b) Explain free space management techniques. [2]

OR

*Q10)*a) Explain with respect to file management. [4]

i) Field.

ii) Record.

iii) File.

iv) Database.

b) Explain two level, tree structured cyclic graph directories. [4]

*Q11)*a) Explain various data structures used by Linux. [4]

b) Explain fork, wait, exec, process management system calls. [5]

OR

*Q12)*a) State silent features of Linux. [3]

b) Explain Inode assignment to new file. [3]

c) Explain different commands of Linux. (Any 3) [3]