17/5/16

MCA - Sem-III (CBSGS)

Operation Research

QP Code : 26699

Duration: 3 Hrs Marks: 80

N.B: (1) Question 1 is compulsory.
(2) Attempt any **four** out of remaining **six questions.**
(3) Assume any additional data, if required, but justify the same.
(4) Figures to the right indicate full marks for that question.
(5) Use of calculator is allowed.

Q1 a) Solve the following LPP using graphical method

Maximize $Z = 20X_1+35X_2$

Subject to $3X_1+3X_2 \leq 36$

$5X_1+2X_2 \leq 50$

$2X_1+6X_2 \leq 60$

and $X_1, X_2 \geq 0$ (10)

b) Solve the following assignment problem and find the optimum assignment that will result in minimum man hours needed.

	Jobs			
Workers	A	B	C	D
I	5	3	2	8
II	7	9	2	6
III	6	4	5	7
IV	5	7	7	8

(10)

Q2 a) Solve the following LPP by Simplex Method

Maximize $Z=3X_1+9X_2$

Subject to, $X_1+4X_2 \leq 8$

$X_1+2X_2 \leq 4$

and $X_1, X_2 \geq 0$ (08)

b) Find the initial basic feasible solution for the following transportation problem by Vogel's approximation Method.

	Destination				Supply
Source	2	3	11	7	6
	1	0	6	1	1
	5	8	15	9	10
Demand	7	5	3	2	

(07)

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Q3 a) Solve the following LPP using Big-M Method.

Minimize $z = 2X_1 + 8X_2$

Subject to, $5X_1 + 10X_2 = 150$

$X_1 \leq 20$

$X_2 \geq 14$

and $X_1, X_2 \geq 0$ (08)

b) Suppose the following estimates of activity times (days) are provided

Activity	Optimistic time	Most Likely time	Pessimistic time
1-2	6	6	24
1-3	6	12	18
1-4	12	12	30
2-5	6	6	6
3-5	12	30	48
4-6	12	30	42
5-6	18	30	54

i) Draw a network

ii) Find the expected duration and variance for each activity.

iii) Find the critical path of the project

(07)

Q4 a) Six jobs are to be processed at three machines A,B and C in the order BAC. The time taken by each job on the three machines is given below. Each machine can process one job at a time.

Determine the optimum sequence for the jobs and total elapsed time; also find the idle time for each machine.

Task	1	2	3	4	5	6
A	30	40	20	10	50	35
B	50	80	90	70	60	75
C	40	80	70	60	20	45

(08)

b) Find the optimal strategies and value of the game where pay-off matrix of the two player is given by

		Player B		
		B1	B2	B3
Player A	A1	7	3	1
	A2	1	7	3
	A3	0	1	7

(07)

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Q5 a) Solve the following using Dual Simplex Method.

Minimize $Z=X_1+2X_2+3X_3$

Subject to , $2X_1 - X_2 + X_3 \geq 4$

$X_1 + X_2 + 2X_3 \leq 8$

$X_2 - X_3 \geq 2$

and $X_1, X_2, X_3 \geq 0$ (08)

b) A company has a machine whose cost is Rs 30,000. Its maintenance cost and resale value at the end of different years are given below.

Year	1	2	3	4	5	6
Maintenance cost (Rs.)	4500	4700	5000	5500	6500	7500
Resale price (Rs.)	27000	25300	24000	21000	18000	13000

At what time interval, in your opinion, should the machine be replaced? (07)

Q6 a) Draw the network diagram. Find total, free and independent floats and determine the critical path

Activity	0-1	1-2	1-3	2-4	2-5	3-4	3-6	4-7	5-7	6-7
Duration	2	8	10	6	3	3	7	5	2	8

(08)

b) The following matrix gives the payoff of different strategies S1,S2,S3 against different conditions N1,N2,N3 and N4

	N1	N2	N3	N4
S1	4000	-100	6000	18000
S2	20000	5000	400	0
S3	20000	15000	-2000	1000

Indicate the decision taken under the following approach i) pessimistic ii) optimistic and iii) regret (07)

Q7 a) A salesman wants to visit cities A,B,C,D and E. He does not want to visit any city twice before completing his tour of all the cities and wishes to return to the point of starting journey. Cost of going from one city to another (in Rupees) is shown in the following table. Find the least cost route.

From City \ To City	A	B	C	D	E
A	-	4	7	3	4
B	4	-	6	3	4
C	7	6	-	7	5
D	3	3	7	-	7
E	4	4	5	7	-

(08)

b) i. Explain in brief 'Pure and mixed strategies in game theory'.

ii. Obtain the dual of the following

Maximize $Z = 7X_1 + 5X_2$

Subject to. $3X_1 + X_2 \leq 48$

$2X_1 + X_2 \leq 40$

and $X_1, X_2 \geq 0$ (07)

MCA Sem-III (CBGS)
Network Security

QP Code : 26696

(3 Hours) [total Marks: 80]

N. B.: (1) Question number 1 is compulsory
(2) Attempt any 4 from question Nos. 2 to 7.
(3) Illustrate answers with sketches wherever necessary.

1. A] Define Network Security. What are the services and mechanisms provided by Network Security? 10
B] What are the algorithm modes uses for secret key cryptography? 10

2. A] Explain in details on DES algorithm with reference to its overview and a DES round. 08
B] What do you mean by Hash function? Compare the terms SHA1 and MD5. 07

3. A] Explain RSA algorithm with a suitable example. 08
B] Write an algorithm of Diffie – Hellman Key distribution and explain the concept of Man – in – the – Middle attack with proper numerical example. 07

4. A] What are the various forms of Authentication? Explain in details. 08
B] Explain KDC. How does the key distribution work with multiple KDC domains? 07

5. A] How are Kerberos ticket lifetimes in V5 different from V4? 08
B] Discuss Inter – realm authentication in Kerberos. 07

6. A] What is a digital certificate? Explain the stepwise process of certificate generation? 08
B] Explain how SET ensures a secure e – commerce transaction. 07

7. Write short notes on: (any three) 15
a) Honey Pots
b) Intrusion Detection and its types
c) Integrity check
d) SSL

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MCA - SEM: III (CBSGS) 9/05/2016

Sub:- Database Management System

QP Code : 26692

(3 Hours) **[Total Marks: 80]**

Note:
- Q1 is compulsory. Attempt any four out of remaining six questions.
- Assumptions made should be clearly stated.

1 a) Construct an ER diagram for the online tour and travel system. Document all assumptions that you make for designing. 10

b) Create relational schema for the above ER diagram and normalize the same till 3NF. 10

2 a) Differentiate the following(Any two) 08
   a) Dense Index and Sparse Index
   b) Primary Key,Unique Key and Foreign Key
   c) 2PL,Strict 2PL and Rigorous 2PL

b) Draw and explain the state diagram for the transaction in database 07

3 a) Explain and draw the architecture of DBMS 08

b) Explain log based recovery technique in database management system 07

4 a) What is deadlock? Explain the various deadlock detention and prevention techniques. 08

b) Explain the main responsibilities handle by DBA. 07

5 a) What is timestamp protocol? Explain how it is used for concurrency control in database 08

b) What is Bell-LaPadula model? Explain how it is used for database security. 07

6 a) What is B tree ?Explain how it is used for enhancing the performance to fetch the data from database 08

b) Explain the heuristic approach for query optimization 07

7 Write short note on the following (Any Three) 15
   a) Aggregation
   b) Weak Entity
   c) Shadow paging
   d) Closure of attribute

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MCA - SEM - III (CBSGS) 11/5/16

C. G.

QP Code : 26695

[3 hours] 80 marks

N.B. : (1) Q1. Is compulsory
(2) Attempt any 4 questions out of remaining six questions
(3) Figures to the right indicate full marks
(4) Use of scientific calculator is allowed

Q1 a) Derive the Liang Barsky's line clipping algorithm and use it to clip a line P1-P2 with P1(-75,-100) , P2(175,50) against the window with (Xwmin, Ywmin) ≡(0,0) and (Xwmax, Ywmax) ≡ (150,100) (10)

b) How is image sampling and quantization done, Explain in detail. (05)

c) What are Octrees? How can they be used to represent Three-Dimensional Objects (05)

Q2 a) Explain the Z-Buffer algorithm for hidden surface removal and compare it with A-buffer algorithm. (08)

b) Apply the following transformations on the following 3BPP image (07)

1) Image Negative
2) Gray-level slicing with background range of interest (r1=3, r2=5)
3) Threshold with threshold value =4

3	0	6	3	7	6
1	7	1	3	0	7
7	3	3	5	0	2
5	3	0	5	6	2
6	1	2	1	4	2

Q3 a) Equalize the following histogram and draw the original and equalized histogram. (08)

Intensity	0	1	2	3	4	5	6	7
No. Of Pixels	15	28	5	7	24	5	6	10

b) What is a fractal? What are its different types? How is a fractal dimension measured? (07)

Q4 a) Use Bresenham's line drawing algorithm to rasterize the line P1-P2 with endpoints P1(10,10) , P2(20,16) (08)

Q4 b) Write the properties of B-Spline curves. How are they different from Bezier curves? (07)

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Q5 a) A rectangle has lower left corner at (20,20), and upper right corner at (60,40) (08)

Perform the following transformations one after another on the rectangle and obtain its coordinates after every transformation.

1) Rotation by 90 degrees in anticlockwise direction, about its center
2) Scale the rectangle about origin so that it reduces to half of its size
3) Reflection in Y axis.

b) Explain with examples i) Inside – Outside test. ii)Winding number rule test (07)

Q6 a) Derive the Scanline polygon filling algorithm (08)

b) Explain in detail Halftoning and Dithering techniques. (07)

Q7

a) Derive the Sutherland Hodgeman Polygon clipping algorithm (08)

b) How is a parallel projection taken? What are its different types? How is it different from perspective projection? (07)

MCA Sem III CBSGS 19-5-2016

Sub:- Software Project management **QP Code : 26703**

[Total Marks: 80]

(3 Hours)

N.B.: (1) Question No.1 is **compulsory.**
(2) Attempt any **four** from the remaining **six** questions.
(3) Answers to questions should be grouped and written together.
(4) Draw the diagrams whenever required.

Q1 (a): What is role of Project Manager in an IT project? What is skill set required for good project manager? (10)

Q1 (b): What do you mean by cost and budgeting of an IT project? What are the basic principles of cost management should be considered at time of cost estimation? Explain which type of estimate should be used when and why? (10)

Q2 (a): What is project implementation? Explain different approaches for the Project implementation. (08)

Q2 (b): What is MOV? What are the steps to develop the MOV? (07)

Q3 (a): Why quality of IT project is necessary? What do you mean by cost of Quality and cost categories related to quality? (08)

Q3 (b): Explain the difference between scope verification and scope control. (07)

Q4 (a) : Discuss the common sources of risk on information Technology projects and describe the contents of risk register and how the risk register is used in several risk management processes? (08)

Q4 (b): Explain control charts and seven run rule in quality management. (07)

Q5 (a): What is project procurement management? Explain different processes involved in it? (08)

Q5 (b): What are the steps required for Project Closure. (07)

Q6 (a): What are the main types of contracts if you decide to outsource? What are the advantages and disadvantages of each? (08)

Q6 (b): Discuss the project metrics in detail. (07)

Q7: Write Short Notes on any three: - (15)

a) WBS.

b) Responsibility Assignment matrix

c) Matrix organization

d) Statistical Sampling.

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