[5521]-12
M.C.A. (Commerce Faculty) (Semester - I)
102 : System Organisation and Management

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

1) *Attempt all questions.*

2) *All questions carry equal marks.*

Q1) Answer the following (Any Four) :   **[16]**

a) Distinguish between Data and Information.

b) State features of line and staff organisation.

c) Explain process of planning.

d) What do you mean by customer Relationship Management?

e) Give essentials of good control system.

Q2) Explain the following terms (Any Four) :   **[16]**

a) Management.

b) Planning.

c) Forecasting.

d) Information.

e) Staffing.

f) Internet.

Q3) Answer the following (Any Four) :   **[16]**

a) Distinguish between formal and Informal organisation.

b) Describe Maslow's Need Hierarchy theory.

c) State sources of Recruitment.

d) Explain role of information system in the development of a business organisation.

e) Discuss growing importance of Enterprise Resource planning in manufacturing sector.

P.T.O.

Q4) Answer the following (Any Four) :   [16]

    a)   State and explain elements of management information system.

    b)   Determine information requirements for a marketing manager.

    c)   Give advantages of E-Commerce.

    d)   Describe features of Decision support system.

    e)   Explain importance of management.

Q5) Write short note on (Any Four) :   [16]

    a)   Use of SWOT Analysis.

    b)   Types of information systems.

    c)   Process of Communication.

    d)   Job Rotation.

    e)   Level of management.

    f)   Hardware and software requirements for efficient information centre.

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[5521]-13

M.C.A. (Commerce Faculty) (Semester - I)
103 : PROGRAMMING FUNDAMENTALS ('C' Programming)
(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates :
  1) *All questions are compulsory.*
  2) *All questions carry equal marks.*
  3) *Assume suitable data, if necessary.*

Q1) Attempt Any Four.   [4 × 4 = 16]

  a) Define the terms:
     i) Compiler
     ii) Interpreter
  b) 'C' is middle level language. Comment.
  c) Write a short note on Escape Sequences.
  d) Differentiate between printf() and scanf( ).
  e) Explain break statement.

Q2) Attempt Any Four.   [4 × 4 = 16]

  a) Write a C' program to calculate circumference of circle and volume of sphere.
  b) Write a C' program to calculate factorial of a number.
  c) Write a 'C' program to reverse the array elements.
  d) Write a 'C' program to generate following pattern.

     1
     2   3
     4   5   6
     7   8   9   10

  e) Write a 'C' program to check given year is leap year or not?

Q3) Attempt Any Four.   **[4 × 4 = 16]**

    a)   What is function? Explain any two storage classes in function.

    b)   What is DMA? Explain functions included in DMA.

    c)   Explain Structure with proper example.

    d)   Define Array. Explain different types of array.

    e)   What is Macro? How do we write macros in 'C'.

Q4) Trace the output and justify. (Any Four)   **[4 × 4 = 16]**

    a)   intx, y, z;

            x = 2, y = 1;

            z = x > y?x : y

            printf("% d",z);

            Justify your answer.

    b)   main()

```
{
    int i;
    for(i=1 ;i<10;i++)
    {
        printf("%d",i);
        if(i==3) continue;
        printf("***");
    }
}
```

    c)   #define SQUARE(x) x*x

            main( )

```
{
    printf("\n%d", SQUARE(4+2));
}
```

d) Find memory requirement for-

```c
union t1
{
    char s[5];
    intnum;
};
```

e) void main( )

```c
{
    int x = 4, y = 3, z;
    z = x- --y;
    printf("%d%d%d",x,y,z);
}
```

Q5) Attempt Any Four.   [4 × 4 = 16]

a) Write a 'C' program to calculate addition of two matrices.

b) Write a 'C' program to check whether the number is armstrong or not.

c) Write a 'C' program to reverse a string without using standard library function.

d) Write a 'C' program to copy the contents of one file into another file.

e) Write a 'C' program to create structure Employee having fields eno,emp_name,salary. Accept and display the information of three employees.

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[5521]-14

M.C.A. (Commerce Faculty) (Semester - I)
NUMERICAL AND STATISTICAL METHODS
(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates :
  1) *All questions are compulsory.*
  2) *Figures to the right indicate full marks.*
  3) *Use of statistical tables and calculator is allowed.*
  4) *Symbols have their usual meaning.*

Q1) Attempt any Three of the following :   **[15]**

  a)   Find the root of the equation $x^3 - 9x + 1 = 0$ correct to three decimal places by using Bisection method.

  b)   Using Newton - Raphson method, find the root of the equation $x^3 - 3 = 0$ (Take $x_0 = 2$) perform only two iterations.

  c)   Give $f(0) = 2$, $f(1) = 9$, $f(2) = 25$, $f(3) = 39$ $f(4) = 90$ and $f(5) = 91$. Construct a forward difference table and find $\Delta^5 f(0)$.

  d)   Evaluate $\Delta(x^2 + e^x + 2)$.

  e)   Prove that $(1 + \Delta)(1 - \nabla) \equiv 1$.

Q2) Attempt any Three of the following :   **[15]**

  a)   Express the function $2x^3 - 3x^2 + 3x - 10$ in factorial notation, interval of differencing being unit.

  b)   Use Newton - Gregory formula for interpolation to find the value of $f(x)$ at $x = 4$ from the table given below.

x	3	5	7	9	11
$f(x)$	6	24	58	108	174

c) From the following table, compute $\dfrac{dy}{dx}$ at $x = 1$.

x	1	2	3	4	5	6
y	1	8	27	64	125	216

d) Evaluate $\int_0^6 \dfrac{1}{1+x^2} dx$ by using simpson's $\left(\dfrac{1}{3}\right)^{rd}$ rule. (Take $n = 6$).

e) Given $\dfrac{dy}{dx} = 1 + xy$ with initial condition that $y = 1$ when $x = 0$. Compute y(0.1) and y(0.2) by using Euler's method.

Q3) Attempt any Three of the following : **[3 × 5 = 15]**

a) i) Define classical definition of probability.

   ii) A integer is chosen at random from 1 to 100. What is the probability that the chosen integer is divisible by 10?

b) State probability density function (pdf) of normal distribution. State its properties.

c) If $X \to N(100, 9)$ then solve $P(X \geq 100)$, $P(X \leq 100)$, $P(97 \leq X \leq 103)$.

d) Marks scored by students in an examination follows normal distribution, 44% of the students obtained marks below 55 and 6% of the students obtained marks above 80. Find the parameters of the normal distribution.

e) What do you mean by time series? Discuss the four components of time series.

Q4) Attempt any Three of the following : **[3 × 5 = 15]**

a) Define the terms : Null hypothesis, Alternative hypothesis, Critical region.

b) An automatic machine is designed to full tins with 2 kg of oil with a standard deviation 0.1 kg. A sample of 100 tins was inspected and the average weight was found to be 0.194 kgs. Can we say that the machine is working properly. Use 5% Level of Significance (L.O.S.)

c) A coin is tossed 400 times and it turned up tail 210 times. Can the coin be regarded as true? Use 5% L.O.S.

d) The table below gives the number of books issued from a certain library on the various days of a week.

Days	Mon.	Tue.	Wed.	Thurs.	Fri.	Sat
No. of books issued	120	130	110	115	135	110

Test at 5% L.O.S. Whether the issuing of books are uniformly distributed over the days.

e) Explain in detail paired t-test along with the assumptions made.

Q5) Attempt the following :   **[2 × 10 = 20]**

a) The time taken by workers in performing a job by Method I and II is given below:

Method I	20	16	26	27	23	22	
Method II	27	33	42	35	32	34	38

Do the data shows that the variance of time distribution of population from which these samples are drawn do not differ significantly? Use 10% L.O.S.

OR

Fit autoregressive model of first order to the following time series.

Year(t)	1	2	3	4	5	6	7	8	9	10	11
Yt	99	95	83	100	109	105	97	104	94	105	109

b) Use Picard iteration method, to obtain the second approximation to the solution of $\frac{dy}{dx} = 1 + y^2$ with initial condition y(0).

OR

Use Runge - Kutta second order method to compute the value of y when x = 0.1, Given that $\frac{dy}{dx} = x + y$, x = 0, y = 1.

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[5521]-16

M.C.A. (Commerce Faculty) (Semester - I)

106 : SOFTWARE ENGINEERING

(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates :
1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Draw Diagrams wherever necessary.*

Q1) Solve the following case study:

Maxwell is a trading company which sells various consumables to its dealers, such as floppy boxes of 1.2 Mb, 1.44 Mb, Printer ribbons, cartridge tapes etc. On receiving enquiry from the dealer, the company sends quotation to dealer. The dealer afterwards sends order to the company. If the stock is available then the order acceptance is sent to the dealer and subsequently invoice-cum delivery challan is sent to the dealer. The dealer after verification returns items if they are of bad quality. If the stock is not available then the purchase requisition is sent to the purchase department of the company for purchase of items. Some MIS reports such as item wise sales, dealer wise sales sent to the management.

Read above case study and Draw the following Diagrams:

a) Draw E-R Diagram.   **[6]**

b) Draw CLD and break it till first level.   **[6]**

c) Design input and output screen.   **[4]**

Q2) Answer the following (Any Four) :   **[4 × 4 = 16]**

a) What is System? Explain its characteristics.

b) What is Data Dictionary? Why it is needed?

c) Explain different types of implementation strategies.

d) Explain Re-Engineering in details.

e) Differentiate between alpha and beta testing.

Q3) Answer the following (Any Four) :   [4 × 4 = 16]
  a) Explain Decision tree with an example.
  b) Explain Tuning and Optimization.
  c) Explain SDLC in details.
  d) What is CMM? Explain its levels.
  e) Explain different types of test data generators.

Q4) Answer the following (Any Four) :   [4 × 4 = 16]
  a) Write a note on Prototyping model.
  b) Draw decision table for the following:

      If the volume of sales is greater than Rs. 10000 and advance collected is
      70% or more then commission is 20%, if advance collected is less than
      70% then it is 15%. For sales Rs. 10000 irrespective of the advance
      collected commission is 12%. For Sales less than Rs. 10000, commission
      is 10% or 9% based on whether advance collected is 70% more or less
      respectively.

  c) What is normalization? Explain its uses.
  d) Explain the role of System analyst in SDLC.
  e) Explain ISO standards in details.

Q5) Write a note on following (Any Four) :   [4 × 4 = 16]
  a) 4GL
  b) Structured chart.
  c) Fact finding Techniques
  d) Debugging.
  e) Software Quality.

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[5521]-22

M.C.A. (Commerce) (Semester - II)

202 : RELATIONAL DATABASE MANAGEMENT SYSTEMS

(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates :
1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*

Q1) Attempt all   **[8 × 2 = 16]**

a) Define :
   i) Primary Key
   ii) Foreign Key

b) List any 4 applications of DBMS.

c) What is Data Model? Which are categories of data model?

d) What is View? Give syntax.

e) What is CHECK constraint?

f) What are Commit and Rollback?

g) Differentiate Simple and Composite attributes.

h) Which are two different Lock modes associated with a data item?

Q2) Attempt following (Any Four) :   **[4 × 4 = 16]**

a) Explain in brief the action to be taken to recover the system from deadlock.

b) Write a short note on Deferred Update Recovery Based Recovery.

c) What is Transaction? Explain Properties of transaction.

d) Explain different types of failure in system.

e) What is a schedule? Differentiate between Serial and Concurrent schedule.

P.T.O.

Q3) Attempt following (Any Four) :   **[4 × 4 = 16]**

    a)   Write a note on built in aggregate functions in SQL.

    b)   Explain 2-Phase locking protocol and List its versions.

    c)   Write a note on Validation based protocol.

    d)   Explain following operation with example i) Natural Join ii) Project

    e)   What is Integrity Constraint? Which are different types of Integrity Constraint?

Q4) a)   Attempt the following :   **[1 × 10 = 10]**

    A "Diamond' is an agency for flat booking and it has number of builders and agents. A customer can get a flat for residential or commercial purpose. If customer approach througth the agent, the agency and builders are giving some commission to the agent. Agrent shows various flats and sites within various location.

    Draw the ERD for the above scenario. Identify Entities and Relationships.

    b)   Attempt following :   **[2 × 3 = 6]**

        i)   What is Relationship? Explain Binary relationship?

        ii)   Write a note on Specialization.

Q5) a)   Attempt following :   **[2 × 5 = 10]**

    Consider the following schema

    Emp(Eno, Ename, Sal, Desg, Dno)

    Dept(Dno,Dname,Location)

    Solve the following queries using SQL

        i)   List names of employees of "Computer" department

        ii)   Give the names of employee with minimum salary.

        iii)   Delete the records of employees having salary > 50000.

    Solve the following queries using relational algebra.

        i)   Give names of department from "Pune"city

        ii)   Gives name of employee from "Electronics" department

b) Attempt following : [2 × 3 = 6]

   i) Consider the following schedule

T1	T2
R(x)	R(y)
x = x + 50	y = y + 100
W(x)	W(y)
R(y)	R(z)
Y = y – 500	z = z – 200
W(y)	W(z)

   Give one non-serial schedule that is serializable.

   ii) Consider the following schedule and check its serializability using precedence graph.

T1	T2
R(x)	
	R(x)
R(y)	
	W(x)
W(y)	

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[5521]-23

M.C.A. (Commerce Faculty) (Semester - II)

203 : Cost Accounting and Cost Control Techniques

(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates :

1) *All questions are compulsory.*
2) *All questions carry equal marks.*
3) *Use of calculator is allowed.*

Q1) a) Explain the concept of 'Cost Accounting', State the advantages of Cost Accounting. **[8]**

b) Define the term Element of Cost. State the different Element of cost with suitable Examples. **[8]**

Q2) Write short notes (Any Four) : **[16]**

a) Limitation of Cost Accounting.

b) Advantages of Job Costing.

c) Features of Contract Costing.

d) Applicability of operating Costing.

e) Work certified & Work Uncertified.

f) Margin of safety.

Q3) The cost Accounts of Umesh Ltd. Nasik. For the year ended 31-03-2010 showed the following information. **[16]**

Types of stock	As on 1-4-2009	As on 31-3-2010
Raw materials	65,000	50,000
Work-in-progress	10,000	7,500
Finished stock	15,000	5,000

	Rs.
Unerwriting Commission	10,000
Purchases of Raw materials	2,60,000
Selling over heads	8,000
Drawing office salary	12,000
Productive Labour	1,65,000
Audit fee	7,000
Establishment on Cost	2,000
Steam, Gas and Water	1,500
Sales	5,50,000
Rent	15,000
(Factory - ($66\frac{2}{3}$%, office $33\frac{1}{3}$%)	
Architect's fee	10,000
Wages out standing	5,000
Octroi and Duty	5,000
Distribution on Cost	2,000

Prepare a Cost - sheet showing.

a) Cost of material Consumed

b) Prime Cost

c) Works Cost

d) Cost of production

e) Total Cost

f) Profit

Q4) Product X is obtained after it passes through three distinct processes. You are required to prepare process Accounts from the following information. **[16]**

Particulars	Total Rs.	Process		
		I Rs.	II Rs.	III Rs.
Material	15084	5200	3960	5924
Direct wages	18000	4000	6000	8000
Production Over heads	18000	-	-	-

1000 Units @ Rs. 6 per unit were introduced in process - I.

Production over heads to be distributed as 100% on direct wages.

Process	Actual Output Units	Normal Loss	Value of scrap Per Unit Rs.
I	950	5%	4
II	840	10%	8
III	750	15%	10

OR

Gajanan Construction, Nasik a contract No. 203 for construction of a school building on 1st January 2010 the contract price is fixed at Rs. 15,00,000; subject to a retention of 20% of work certified. The following are the details of expenditure made by contractor on this contract during the year.

	Rs.
Direct labour charges	4,05,000
Materials issued from stores	4,20,000
Materials Directly purchased	81,200
Plant installed at site on 30th June 10	60,000
Direct Expenses	23,000
Management overheads	37,200
Material transferred to Contract No. 105	6,300
Outstanding wages	7,800
Material transferred from contract No. 505	1,600
Work Certified	11,00,000
Work Uncertified	16,500
Cash received from contractee up to 31st Dece. 2010	8,80,000

Depreciation on plant is provided @ 40% p.a. on the original Cost.

Prepare : a) Contract Account.
b) Contractee Account.

Q5) An Engineering factor has the following particulars for the period ended 31-03-2010. Compute the departmental Overhead rate for each of the production department, assuming that overheads are recovered as a percentage of direct wages. **[16]**

Particulars	Production Deptt.			Service Deptt.	
	A Rs.	B Rs.	C Rs.	X Rs.	Y Rs.
Direct wages	30,000	45,000	60,000	15,000	30,000
Direct Material	15,000	30,000	30,000	22,500	22,500
Staff Number	1,500	2,250	2,250	750	750
Electricity KWH	6,000	4,500	3,000	1,500	1,500
Assets Value	60,000	40,000	30,000	10,000	10,000
Light points	10	16	4	6	4
Area (sq.ft.)	1,500	2,500	500	500	500

The Expenses for the period were :

	Rs.
Power	1,100
Lighting	200
Store overheads	800
Staff welfare	3,000
Depreciation	30,000
Repairs	6,000
General overheads	12,000
Rent and Taxes	550

Apportion the expenses of service department 'Y' on the basis of Direct wages and those of service department 'X' in the ratio 5:3:2 to the production Department.

OR

Prepare a cash Budget of MICO Ltd. Nasik. from March 2010 to August 2010.

Month	Sales Rs.	Selling Exp. Rs.	Purchases Rs.	Wages Rs.	Factory Exp. Rs.	Administrative Exp. Rs.
January	1,70,000	7,000	80,000	15,000	10,000	5,000
February	1,60,000	7,500	84,000	16,000	11,000	5,500
March	1,82,000	6,500	83,000	16,800	8,000	4,500
April	1,55,000	6,800	83,000	12,000	10,500	4,750
May	1,65,000	7,400	76,000	18,000	12,000	5,400
June	2,00,000	7,000	68,000	16,000	9,600	5,700
July	1,80,000	6,000	70,000	17,000	8,000	5,000
August	2,20,000	5,500	58,000	16,500	9,600	5,500

Other information :

a) Opening cash Balance on 1st March 2010 Rs. 20,000.

b) Period of credit allowed to customers and by suppliers - One month.

c) Lag in the payment of factory Expenses. Administrative Expenses and selling Expenses - One month.

d) Machinery purchased for Rs. 30,000 in March payable on delivery.

e) Building purchased in April for Rs. 1,50,000 payable in two equal instalments in May and July.

f) 5% Commission of sales payable two months after sales.

g) Delay in the payment of wages - one month.

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[5521]-24

M.C.A. (Commerce Faculty) (Semester - II)
204 : Accounting for Management
(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates :
1) *All questions are compulsory.*
2) *All questions carry equal mark.*

Q1) Define Management Accounting. What are the Advantages and Limitations of Management Accounting?

                                        OR

What do you mean by 'Ratio Analysis'? Explain the various types of accounting ratios.

Q2) Distinguish between find flow statement and cash flow statement.

                                        OR

Write short notes on any four.
a)   Common size income statement.
b)   Assumptions of Break Even Analysis.
c)   Under capitalisation.
d)   Master Budget.
e)   Trend Analysis.
f)   Inter - firm comparison

Q3) a)   What are the duties of Management Accountant?
b)   Prepare Budget as 70% and 90% capacity from the following information:-
Cost of production
Raw material   Rs. 20 per unit.
Labour Cost   Rs. 15 per unit.
Factory overheads (40% fixed)   Rs. 10 per unit.
Office overheads (80% fixed)   Rs. 5 per unit.
Selling overheads (30% fixed)   Rs. 4 per unit.
Output at 60% capacity during the first quarter was 42,000 units.

                                                        P.T.O.

Q4) The following are the summarised Balance sheets of Laxmi Engineering Ltd. as on 31-3-09 and 31-3-10.

Balance Sheet

Liabilities	31-3-09 Rs.	31-3-10 Rs.	Assets	31-3-09 Rs.	31-3-10 Rs.
Equity share capital	3,00,000	4,00,000	Good will	1,15,000	90,000
8% Redeemable Preference share capital	1,50,000	1,00,000	Land and Building	2,00,000	1,70,000
			Plant	80,000	2,00,000
General Reserve	40,000	70,000	Debtors	1,60,000	2,00,000
Profit and loss A/c	30,000	48,000	Stock	77,000	1,09,000
Proposed Dividend	42,000	50,000	Bills Receivable	20,000	30,000
Creditors	55,000	83,000	Cash in Hand	15,000	10,000
Bills Payable	20,000	16,000	Cash at Bank	10,000	8,000
Provision for Taxation	40,000	50,000			
	6,77,000	8,17,000		6,77,000	8,17,000

Additional Information -

a) Depreciation of Rs. 10,000 and Rs. 20,000 has been charged on plant and Land and Buildings respectively during the year ending 31-3-10.

b) An Interim Dividend of Rs. 20,000 has been paid during the year ending 31-3-10.

c) Income Tax Rs. 35,000 has been paid during the year ending 31-3-10.

You are required to prepare statement showing Sources and Application of funds for the year ending 31-3-2010 and other necessary ledger Accounts.

Q5) Ajay Corporation Ltd. has prepared the following Budget estimates for the year 2009-10.

Sales (Units)	15,000
Particulars	Rs.
Fixed Expenses	34,000
Sales Value	1,50,000
Variable Costs (Per unit)	6

You are required to :

a) Find the P/V ratio, Break even point and Margin of safety.

b) Calculate the revised P/V ratio, Break even point and margin of safety in each of the following cases.

    i) Decrease of 10% in selling price.

    ii) Increase of 10% variable cost.

    iii) Increase of sales volume by 2,000 units.

    iv) Increase of Rs. 6,000 in fixed costs.

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[5521]-25

M.C.A. (Commerce) (Semester - II)
205 : Networking Operations
(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates :
  1) *All questions are compulsory.*
  2) *Figures to the right indicate full marks.*

Q1) Answer the following (Any 4) :   **[16]**

   a) Define computer networks? State & explain its applications.

   b) Explain different components of NIC.

   c) Write a note on unguided media.

   d) Explain Intranet & Extranet.

   e) What are the different service primitives.

Q2) Answer the following (Any 4) :   **[16]**

   a) Explain the physical structure of coaxial cable. State its applications.

   b) Explain Ring & star topology. State its advantages & disadvantages.

   c) Explain the concept of spanning tree bridges.

   d) Explain the working of ARP protocol.

   e) What are serial & parallel transmission.

Q3) Answer the following (Any 4) :   **[16]**

   a) Explain architecture of Bluetooth.

   b) Explain in details the frame format of IP Datagram.

   c) Compare ISO-OSI model & TCP/IP protocol suite.

   d) What are the types of networks based on scale & transmission technology.

   e) Explain passive & active Hubs.

Q4) Answer the following (Any 4) :   [16]

    a)   Write a note on search Engines.

    b)   Explain IEEE 802.11 architecture along with the frame types.

    c)   Explain connection oriented services with suitable example.

    d)   Explain single mode & multimode fibre optics cable.

    e)   Explain the working of subnet.

Q5) Answer the following (Any 1) :

    a)   i)   Explain TCP/IP Protocol stack.   [8]

          ii)   Write a note on Network security devices.   [8]

<div align="center">OR</div>

    b)   i)   Explain ISO-OSI model in details.   [8]

          ii)   What's a protocol? What are different standards of protocols? Explain the key elements of a protocol.   [8]

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[5521]-26

M.C.A. (Commerce Faculty) (Semester - II)
206 : OBJECT ORIENTED PROGRAMMING
(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates:

    1)   All questions are compulsory.

    2)   Figures to the right indicate full marks.

    3)   All questions carry equal marks.

    4)   Assume suitable data if necessary.

Q1) Attempt any four: **[4 × 4 = 16]**

    a)   Explain features of Java?

    b)   What is difference between c and C++?

    c)   What is destructor? Explain its type with example.

    d)   What is variable? Explain variable types with example used in java.

    e)   Explain friend function?

Q2) Attempt any four: **[4 × 4 = 16]**

    a)   What is Inheritance? How it is used in C++?

    b)   Explain the different Data Types supported by Java.

    c)   Explain the structure of Java program?

    d)   Explain Polymorphism used in C++?

    e)   Explain scope resolution operator with example?

Q3) Attempt any four: [4 × 4 = 16]

    a)   What is Array? Explain its types.

    b)   Write a note on Garbage Collection.

    c)   Explain the use of final keyword?

    d)   Explain various access specifiers used in C++ and Java?

    e)   Differentiate Overloading and Overriding with example.

Q4) Attempt any four: [4 × 4 = 16]

    a)   Write a C++ program to print multiplication table of a given digit using while loop.

    b)   Write a program that accepts name of books from command line and store, display them in ascending order.(using array)

    c)   Write a program using C++ to calculate percentage of student.

    d)   Write a program in Java to print the following output:

        4

        4 3

        4 3 2

        4 3 2 1

    e)   Write a Java program to read line of integers. Display each integer and also display sum of all integers.

Q5) A) Trace output: (Consider there is no syntax error in given code) **[2 × 4 = 8]**

   a)
   ```
   class Test {
   protected int x, y;
   }
   class Main {
        public static void main(String args[]) {
             Test t = new Test ( );
             System.out.println (t.x +" " + t.y);
        }
   }
   ```

   b)
   ```
   #include <stdio.h>
        class Test
        {
          Static int i;
          int j;
        };
          int Test::i;
          int main( )
        {
             cout << sizeof(Test);
             return 0;
        }
   }
   ```

B) Attempt any two: **[2 × 4 = 8]**

   a)   Write a Java program to accept a number from the user. If number is zero, then throw user defined exception "Number is O", otherwise display number on screen.

   b)   Write a C++ program to accept a number and check whether it is perfect or no

   c)   Write a program in java to check whether the entered character is digit, alphabet or space character.

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[5521]-31

M.C.A. (Commerce Faculty) (Semester - III)
301 : Advanced Operating Systems
(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates :
  1)   *All questions are compulsory.*
  2)   *All questions carry equal marks.*

Q1) Attempt the following (Any 4) :   **[4 × 4 = 16]**

  a)   Write short note on Hungarian notation.

  b)   Explain different methods to get handle to device context.

  c)   State Difference between model and modelers dialog box.

  d)   Define GDI. Explain GDI functions.

  e)   Explain features of unix operating system.

Q2) State true or false and justify your answer (any 4) :   **[4 × 4 = 16]**

  a)   An invalid rectangle is the area on the screen which is not part of any window.

  b)   The 'Edit' control provides built in cut, copy, paste functionality.

  c)   System menu of a Window cannot be modified.

  d)   WM_Timer is a low priority message.

  e)   Functionality of child window can be modified.

P.T.O.

Q3) Answer the following (Any 8)   [16]

   a)   Define Caret.

   b)   Define Pipe.

   c)   Define Shell.

   d)   What are child window controls?

   e)   Enlist scrollbar messages.

   f)   What is Handle?

   g)   What is call back function?

   h)   What are metafiles?

   i)   Explain Peek Message ( ).

   j)   Define valid and invalid rectangles.

Q4) Answer the following (Any 4) :   [16]

   a)   Create an application that displays a message box asking for confirmation
        before exiting application.

   b)   Write shell script to determine if entered number is perfect or not.

   c)   Explain decision control statement of shell.

   d)   Write a Window procedure to scroll string "Welcome" in client area by
        using Timer.

   e)   Display push button at the centre of client area, using Up - down, - left -
        right arrow keys move it accordingly.

Q5) Answer the following (Any 4) :   [16]

   a)   Write any four Linux / Unix commands.

   b)   Explain types of shell.

   c)   Write an algorithm for link system call.

   d)   What are the cases of reading and writing Pipes.

   e)   Explain process state transition diagram.

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[5521]-33
M.C.A. (Commerce Faculty)
303 : Enterprise Resource Planning and Management
(2008 Pattern) (Semester - III)

Time :3 Hours]   *[Max. Marks :80*

Instructions to the candidates:

   1)   ***Solve any five questions.***

   2)   ***Figures to right indicate full marks.***

Q1) Explain in detail different phases of BPR.   **[16]**

Q2) What is Data Warehousing? Explain structure of Data ware housing.   **[16]**

Q3) What is ERP? Explain characteristics and benefits for ERP.   **[16]**

Q4) What is EDI? Explain EDI standard and EDI services.   **[16]**

Q5) What is Consultant? Describe role of consultant for ERP.   **[16]**

Q6) Explain ERP implementation life cycle in detail.   **[16]**

Q7) Write a short note on :   **[16]**
   a)   SAP R/3
   b)   People soft
   c)   Jd Edwards
   d)   QAD

Q8) Explain the term -   **[16]**
   a)   ERP and E-commerce
   b)   EIA (Enterprise Integration Application)
   c)   EDI components
   d)   OLAP

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[5521]-34
M.C.A. (Commerce) (Semester - III)
BUSINESS STRATEGIES
(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates :
1) *Attempt any Five questions.*
2) *Each question carries equal marks.*

Q1) What do you mean by strategy? Explain the importance of Business strategies.

Q2) State and explain the elements and importance of Financial policies.

Q3) Discuss the issues involved in strategy Implementation.

Q4) What do you mean by strategic control? Explain the steps involved in strategic control.

Q5) Discuss the importance of Decision making.

Q6) Explain the qualities essential for a strategist.

Q7) Write short notes on :
a) Environment Analysis
b) Mergers.

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[5521]-36

M.C.A. (Commerce) (Semester - III)

Financial and Investment Analysis

(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates :

    1)   ***Solve any Five questions.***

    2)   ***All questions carry equal marks.***

Q1) Explain the term "Mutual Fund". What are the advantages and disadvantages of Mutual Funds?

Q2) What do you mean by Investment? Explain the objectives of Investments.

Q3) What is meant by Portfolio management? Explain the process of Portfolio management.

Q4) What is Primary Market? Explain the Regulations of Primary Market.

Q5) What is SEBI? Explain the objectives & functions of SEBI.

Q6) Write Short Notes on (Any Four)

    a)   Investment v/s Speculation

    b)   OTCEI

    c)   BSE

    d)   Functions of Financial Intermediaries

    e)   Derivatives

    f)   Primary market and Secondary market.

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[5521]-41

M.C.A. (Commerce) (Semester - IV)

CS - 401 : ADVANCED DATABASE MANAGEMENT SYSTEM

(2008 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates :

1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*

Q1) Write a note on (Any four) : **[4 × 4 = 16]**

a) HITS Algorithm

b) SOAP

c) Horizontal Fragmentation

d) Partitioned Join

e) KDD

Q2) Attempt any four : **[4 × 4 = 16]**

a) What are similarities between OODBMS and ORDBMS?

b) Explain Grid files in detail.

c) What are responsibilities of transaction manager and transaction coordinator?

d) What is Data Warehouse? What are advantages and disadvantages?

e) What is Multimedia database?

Q3) Attempt any four : **[4 × 4 = 16]**

a) Differentiate between OLAP and OLTP.

b) What is replication? What are advantages and disadvantages?

c) What are applications of spatial data?

d) What are characteristics of object oriented database?

e) With the help of example explain use of nested collection.

Q4) Attempt any four : [4 × 4 = 16]

a) What are distributed databases? What are advantages and disadvantages?

b) What is XML DTD?

c) Explain Single lock manager approach in distributed database system.

d) Explain Client /Server architecture.

e) Define :

   i) GIS   ii) Region

   iii) Point Data   iv) Region Data

Q5) Attempt any four : [4 × 4 = 16]

a) Explain Data Mart in detail.

b) Why there is need of parallel database system? Differentiate between shared disk and shared memory architecture.

c) Define :

   i) Posting File   ii) Recall

   iii) Ranked Query   iv) Hub Page

d) Consider the following schema Book(Bno, Bname, Cost)

Perform horizontal fragmentation of Book relation using following predicates

P1: SL Cost < 200

P2: SL Cost > = 200 and Cost < = 500

P3: SL Cost > 500

e) Perform Vertical fragmentation of Project relation given below Project(Pno, Pname, Startdate, Budget, Status) According to following requirements

   i) Site 1 requires information about Pno, Pname, Budget

   ii) Site 2 requires information about Startdate, Status

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[5521]-42

M.C.A. (Commerce) (Semester - IV)
402 : DATA CENTER TECHNOLOGY
(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates:

    1)   All questions are compulsory.

    2)   Figures to the right side indicate full marks.

    3)   Assume suitable data if necessary.

Q1) Answer the following (Any 4)   **[4 × 4 = 16]**

    a)   State the causes of planned and non-planned downtime.

    b)   Explain in detail Data Centre Pre-requisite.

    c)   What are the drawbacks of complex cluster configuration?

    d)   Sate the objectives of HVAC systems.

    e)   Explain Any-to-Any Failover Model.

Q2) Answer the following (Any 4)   **[4 × 4 = 16]**

    a)   What do you mean by automation ? Explain different types of automation.

    b)   Write a short note on symmetric two node clusters.

    c)   Explain system administration & various duties of system administration.

    d)   Write a short note on TPC Benchmark.

    e)   Explain

        i)   Mean Time Between Failures (MTBF).

        ii)   Mean Time to Repair (MTTR).

Q3) Answer the following (Any 4)   **[4 × 4 = 16]**

   a)   Explain Inband & Outband Mointoring.

   b)   "In theory, you get more than enough money for constructing a data center,but in practice, this rarely happens." Comment.

   c)   Explain the factors need to be considered for selecting location of data centre.

   d)   Explain various components provided by ISP within data center.

   e)   Explain what do you mean by Plenum with example.

Q4) Answer the following (Any 4)   **[4 × 4 = 16]**

   a)   Explain how power requirement for data center is estimated.

   b)   Explain the different types of Air Conditioning. Explain anyone in detail.

   c)   Write a short note on NOC(Network Operation Center).

   d)   Explain SPEC-Mail Benchmark.

   e)   Write a short note on : UPS.

Q5) Answer the following (Any 4)   **[4 × 4 = 16]**

   a)   Explain SNMP Protocol in detail.

   b)   Explain top-to-bottom cooled racks.

   c)   What do you mean by budget? What are types of budget? What things are taken in consideration to decide budget for data center?

   d)   Explain the concept of server security. Explain the various sources of server security.

   e)   Write a short note on

        i)   Generators.

        ii)   PODs.

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[5521]-43

M.C.A. (Commerce Faculty) (Semester - IV)

(403) WEB ENABLING SYSTEM AND BUSINESS APPLICATION

(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates :

    1)   *All questions are compulsory.*

    2)   *Figures to the right indicate full marks.*

    3)   *All questions carry equal marks.*

    4)   *Assume suitable data if necessary.*

Q1) Attempt any four :   **[4 × 4 = 16]**

    a)   Explain JSP Life Cycle?

    b)   Write a note on e business?

    c)   Explain J2EE Multitier Architecture.

    d)   Explain need of XML in web designing.

    e)   Explain Client Server Technology.

Q2) Attempt any four :   **[4 × 4 = 16]**

    a)   How Session Tracking is achieved in Java using JSP?

    b)   Explain JDBC Architecture.

    c)   Explain various tags used in JSP.

    d)   Explain Command Pattern.

    e)   Explain doGet() and doPost( ) Methods.

Q3) Attempt any four :   **[4 × 4 = 16]**

    a)   Explain MVC with suitable example.

    b)   Explain JSP tags.

    c)   Compare HTML with XML.

    d)   Write a note on Design Pattern.

    e)   What is the need for a web application to be thread safe?

Q4) Attempt any four :   [4 × 4 = 16]
   a) Explain role of Mediator Pattern in E-Business.
   b) Write a note on cookie.
   c) Explain importance of tag libraries in web application development.
   d) Explain doGet() and doPost( ) Method.
   e) List steps for creating XML Document.

Q5) Attempt any four :   [4 × 4 = 16]
   a) Write a program in Java using JSP which accepts two numbers from user and display multiplication of entered number on next page.
   b) Write a program in java using servlet which accept number from user and displays it in reverse order on next page.
   c) Write a JDBC program to display the patient details treated by "Dr.Ghosh".
   d) Create a XML File that stores information about five well-known social organization.
   e) Write a program in which accepts a number from command line argument and display its next and previous number.

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[5521]-45

M.C.A. (Commerce Faculty) (Semester - IV)
405 : CLIENT/SERVER TECHNOLOGY
(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates:

1) *All questions are compulsory.*
2) *All questions carry equal marks.*
3) *Assume suitable data, if necessary.*

Q1) Attempt any four of the following   **[4 × 4 = 16]**

a)   What is server? Explain the characteristics of client/server.

b)   Write a short note on Gateway.

c)   Explain any two String object methods with examples.

d)   Explain error handling with example.

e)   What is difference between LAN and WAN?

Q2) Attempt any four of the following   **[4 × 4 = 16]**

a)   Explain Client/Server building blocks.

b)   Write a short note on Pipe.

c)   What is bridges? Explain Different types of bridges.

d)   What is session in ASP? When does a start and end.

e)   What are the advantages and disadvantage of JavaScript?

Q3) Attempt any four of the following   **[4 × 4 = 16]**

a)   Write a program using JavaScript which shows any four string manipulation option.

b)   Write a JavaScript to calculate the sum of digits of a given number.

c)   Write a ASP program to insert the data in employee table (empno, empname, designation). Display the records in employee table.

d)   Write a program using a ASP script to for web page to display the following

#

# #

# # #

e)   Write a JavaScript to calculate the factorial of a given number.

Q4) Attempt any four of the following   **[4 × 4 = 16]**

a)   Explain Lock Type in ASP.

b)   Explain cellular digital packet data and private packet radio provider.

c)   Write a short note on Router.

d)   What is fat server? Explain with example.

e)   Explain HTTP request and HTTP response.

Q5) Attempt any four of the following   **[4 × 4 = 16]**

a)   What are the properties of connection object?

b)   Explain three tier architecture.

c)   Explain Arrays in Java Script. Explain Dense Arrays with example.

d)   Write a short note on Intergalactic enterprise.

e)   Explain different types of server.

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[5521]-46

M.C.A. (Commerce Faculty) (Semester - IV)
406 : KNOWLEDGE MANAGEMENT FOR BUSINESS
(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates :
 1) All questions are compulsory.
 2) All questions carry equal marks.

Q1) Attempt any four of the following :   **[4 × 4 = 16]**

 a) Define knowledge Management. State the difference between data, information and knowledge.

 b) What do you mean by Model Based Reasoning compare it with Case Based.

 c) Describe different ways to perform outsourcing.

 d) What is Feasibility Study? Explain different types of feasibility study.

 e) Describe the four possible scenarios of multiple Experts.

Q2) Attempt any four of the following :   **[4 × 4 = 16]**

 a) Describe principles of Case Based Reasoning strategy.

 b) Describe the process of knowledge engineering.

 c) Describe a frame. What do you mean by instantiation of a frame. Explain with example.

 d) Describe seven steps for implementing knowledge management Methodology.

 e) Explain reasons why people are reluctant to share knowledge.

Q3) Write a short note on any four :   [4 × 4 = 16]

    a)   Chief knowledge officer.

    b)   Repertory Grid Analysis.

    c)   Knowledge Repository.

    d)   Interviews.

    e)   Uncertainity.

Q4) Attempt any four of the following :   [4 × 4 = 16]

    a)   State problems and limitation of Expert System.

    b)   Which are the different steps for case Based Reasoning.

    c)   Describe different methods of knowledge Acquisition.

    d)   Explain maintenance and upgradation activities in post Implementation phase.

    e)   Explain Human Elements in Expert System.

Q5) Attempt any two of the following :   [2 × 8 = 16]

    a)   List and describe ten strategies for successful knowledge management.

    b)   Explain process of Backward chaining with example.

    c)   Explain Implementation phase in is development life cycle.

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[5521]-51

M.C.A. (Commerce) (Semester - V)

501 : Content Management System

(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates :

    1)   *All questions are compulsory.*

    2)   *Draw the diagrams wherever necessary.*

Q1) Attempt any four of the following :   **[4 × 4 = 16]**

    a)   CM is distributing business value. Explain.

    b)   Explain any four principles of Moodle.

    c)   Explain 'Authoring' with diagram.

    d)   What are the rules for creating context?

    e)   Explain content of information put to use.

Q2) Attempt any four of the following :   **[4 × 4 = 16]**

    a)   Explain static website with diagram.

    b)   What is formatting? Explain formatting by method.

    c)   How the CM is balance of organization forces.

    d)   What is structure? Explain structure by type.

    e)   Explain 'Repository' from Management System.

Q3) Attempt any four of the following :   **[4 × 4 = 16]**

    a)   Explain 'Workflow System' with diagram.

    b)   State and explain any four myths about Moodle.

    c)   Explain Web CMS with diagram.

    d)   How to gauge complexity by amount of content?

    e)   What is aggregating from collection system?

Q4) Attempt any four of the following :   [4 × 4 = 16]

   a)   Explain Monolythic Vs Mix-and-Match functionality.

   b)   Explain - CM is a distributing Business Value.

   c)   Explain any four do's and two don'ts of Moodle.

   d)   Write a short note on The Web CMS.

   e)   What is structure? Explain structure by type.

Q5) Write the steps for the following (Any four) :   [4 × 4 = 16]

   a)   Create a website for book of all subjects and navigate to computer books.

   b)   Create a website for Cosmetics such that Navigation to the Types of cosmetics.

   c)   Create a website for college and add a new article having subjects of MCA (Commerce).

   d)   Create a website for Ready-made Cloths and insert images.

   e)   Create a website for wrist watch showroom and edit the prices of watches

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[5521]-52

M.C.A. (Commerce) (Semester - V)

502 : Distributed Database Applications

(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates :

    1)   All questions are compulsory.

    2)   Figure to the right indicate full marks.

Q1) Write a note on (Any Four) :   **[4 × 4 = 16]**

    a)   Mixed Fragmentation

    b)   TP Monitor Architecture

    c)   E-catalogs

    d)   Performance Tunning

    e)   R trees.

Q2) Attempt Following (Any Four) :   **[4 × 4 = 16]**

    a)   What are goals of transaction management?

    b)   What are marketplaces? Explain it's different types.

    c)   What are logs? What are the contents of log records?

    d)   What is triangulation? Explain with example.

    e)   What is fragmentation? What are advantages and disadvantages?

Q3) Attempt Following (Any Four) :   **[4 × 4 = 16]**

    a)   What is Transactional workflow? Explain with example.

    b)   Write a note on E-Commerce.

    c)   What is distributed transaction? Explain ACID properties of transaction.

    d)   What is a deadlock? How Deadlocks are recovered in distributed database system?

    e)   What is Timestamp? Explain Basic timestamp mechanism.

P.T.O.

Q4) Attempt Following (Any Four) :   [4 × 4 = 16]

    a)   Define:

        i)   Secure Electronic Transaction

        ii)   Digital Payment System

    b)   What is distributed database system? What are advantages and disadvantages?

    c)   What is use of catalog in distributed databases?

    d)   What are objectives of the design of data distribution?

    e)   Write a note on parametric queries.

Q5) Attempt Following (Any Four) :   [4 × 4 = 16]

    a)   Consider the following relational schema

        Dept(Dno, Dname, Location)

        Emp(Eno, Ename, Salary, Dno)

        Assume that Emp is horizontally fragmented as

            Emp1 = 6Salary <20000(Emp)

            Emp2 = 6Salary >20000(Emp)

            Reduce the following query into a reduced query on fragments.

                Select Ename, Dname

            From Emp, Dept

   Where Emp.Dno=Dept.Dno

            And Salary between 25000 and 40000

    b)   Consider the following scenario.

        Transaction T1 & T3 are executing at site 1. Transaction T2 & T4 are executing at site 2. Transaction T1 is waiting for T3. Transaction T3 is waiting for T4. Transaction T4 is waiting for T2. Transaction T2 is waiting for T1. Draw LWFG & DWFG. Detect the deadlock.

c) Consider the following relational schema Book(bno,bame,pubname,price)

   Author(ano,aname)

   BA(bno,ano)

   Construct optimized operator tree for the following query. Select bname

   from Book, Author, BA

   where Book.bno=BA.bno and

   Author.ano=BA.ano and

   pubname= "Techmax" and price<300

d) Consider the following schema

   Student (Sno, Sname, City, Class)

   Fragment the given relation into fragments Studentl, Student2, Student3 using following predicates

   Studentl = 6class="F.Y" (Student)

   Student2= 6class="S.Y" (Student)

   Student3= 6class="T.Y" (Student)

e) Consider the following relational schema

   Emp (Eno, Ename, City, Dname)

   Proj (Pno, Pname, Status)

   Emp_Proj(Eno, Pno)

   Convert the following tree into optimized operator tree.

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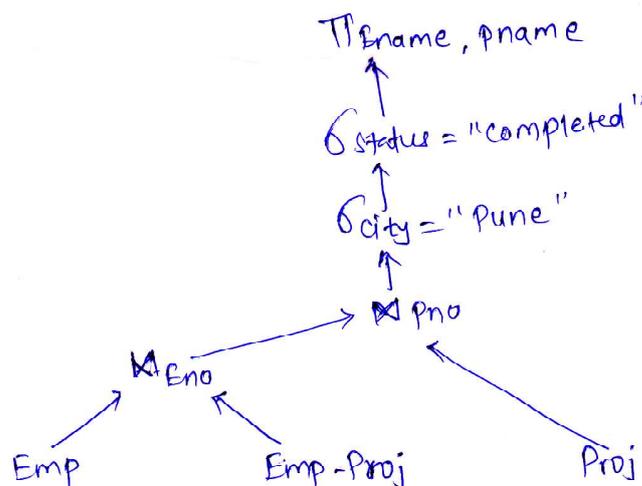
[5521]-53
M.C.A. (Commerce) (Semester - V)
503 : E-Commerce Practices and Technologies
(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates :

1) *All questions are compulsory.*
2) *All questions carry equal marks.*

Q1) Attempt any four of the following :   **[4 × 4 = 16]**

a) Explain B2C Business model in detail.

b) Define E-Commerce. Explain how E-Commerce evolved.

c) Explain personalization with example.

d) Explain hacking and different types of Hackers.

e) Explain EBPP business model in detail.

Q2) Attempt any four of the following :   **[4 × 4 = 16]**

a) Explain credit card fraud.

b) Write notes on :

　　i) Digital certificate.

　　ii) Digital wallet.

c) Explain system analysis and design for an E-Commerce website.

d) Explain types of portals in detail.

e) Explain Horizontal scaling with advantages.

Q3) Attempt any four of the following : [4 × 4 = 16]

   a)   Explain features of E-commerce in detail.

   b)   Explain types of online auction with example.

   c)   Write a note in phishing.

   d)   Explain secret key Cryptography.

   e)   Explain use of digital envelope in E-commerce.

Q4) Attempt any four of the following : [4 × 4 = 16]

   a)   Explain Distributed Denial of service.

   b)   Explain value proposition in Business model.

   c)   Write note on E-Distributor.

   d)   Explain advantages of auction.

   e)   Explain digital signatures.

Q5) Attempt any two of the following : [2 × 8 = 16]

   a)   Explain P_2P file sharing networks.

   b)   What strategies pay pal should pursue in order to maintain its growth over next five years?

   c)   Why are cell - phone networks a threat to pay - pals future growth?

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[5521]-54

M.C.A. (Commerce) (Semester - V)

504 : DATA MINING AND WAREHOUSING

(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates :

1) *All questions are compulsory.*
2) *Neat diagrams must be drawn wherever necessay.*

Q1) Answer in following (any four) :   **[4 × 4 = 16]**

   a)   Why do we need of Business intelligence?

   b)   Explain Hardware Architecture of Data Warehouse.

   c)   Describe different type of server.

   d)   What is cluster analysis

   e)   Explain difference between Data Warehouse and Data Mining.

Q2) Answer the following (any four) :   **[4 × 4 = 16]**

   a)   Explain association rules from Transaction Database.

   b)   Explain Spatial Mining.

   c)   Explain Data Integration and Transformation.

   d)   Explain Data Marting in detail.

   e)   Explain Backup and recovery in data warehousing

Q3) Answer the following (any two) :   **[2 × 8 = 16]**

   a)   Explain the method that mines the complete set of frequent itemsets without candidate generalization.

   b)   Explain Pentaho Report Designer (PRD) with its all features.

   c)   Explain with an example Baysian Classification.

Q4) Answer the following (any two) :   **[2 × 8 = 16]**

   a)   Explain star schema with example and diagram.

   b)   What is knowledge base? Explain any five data mining techniques.

   c)   What are the three techniques used in decision tree? Explain any one in detail.

Q5) Write short notes on (any four) :   **[4 × 4 = 16]**

   a)   Data integration

   b)   Meta Data

   c)   Multidimensional Cube

   d)   Multi Level Association Rule

   e)   BI Offerings

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[5521]-56

M.C.A. (Commerce Faculty) (Semester - V)
MATHEMATICS
506 : Operations Research
(2008 Pattern)

Time : 3 Hours]   *[Max. Marks : 80*

Instructions to the candidates :

    1)   All questions are compulsory.

    2)   Figures to the right indicate full marks.

    3)   Use of statistical tables and calculator is allowed.

    4)   Symbols have their usual meanings.

Q1) Attempt any four of the following :   **[16]**

    a)   What is general linear programming problem? Write it in mathematical form.

    b)   Show that the following L.P.P. has unbounded solution

        Max. $Z = x_1 + 3x_2 + 4x_3 + 5x_4$

        Subject to : $2x_1 + 6x_2 - 5x_3 + x_4 \geq -5$

                    $x_1 - 4x_2 + 5x_3 + 2x_4 \leq 11$

                    $8x_1 - x_2 - 2x_3 + 3x_4 \leq 20$

                      $x_1, x_2, x_3, x_4 \leq 0$

    c)   Explain the following terms :

        i)   Surplus variables

        ii)   Basic solution

        iii) Degenerate Basic feasible solution

        iv) Alternate solution

    d)   Solve the following L.P.P. by graphical method

        Max.$Z = 3x_1 + 2x_2$

        Subject to the constraints :

$$x_1 + x_2 \leq 4$$
$$3x_1 + 8x_2 \leq 24$$
$$10x_1 + 7x_2 \leq 35$$
$$x_1, x_2 \geq 0$$

e) Discuss the various steps involved in the application of PERT and CPM.

f) Obtain an initial basic feasible solution of the following transportation problem by Matrix Minima method.

To → From↓	D_1	D_2	D_3	D_4	Supply
A_1	5	2	4	3	22
A_2	4	8	1	6	15
A_3	4	6	7	5	8
Demand	7	12	17	9	

Also find the corresponding transportation cost.

Q2) Attempt any four of the following : [16]

a) Define :

   i) Network

   ii) Predecessor Activity

b) Write the standard form of the L.P.P.

   Min. $Z = 3x_1 + x_2 + 2x_3$

   Subject to :

   $$2x_1 - x_2 + 4x_3 \leq 12$$
   $$-4x_1 + 5x_2 \leq 17$$
   $$-x_1 + 5x_2 + 8x_3 \geq -15$$
   $$x_1, x_2, x_3 \geq 0$$

c) Write the dual of the following L.P.P. :

   Max. $z = 17x_1 + 3x_2 - x_3$

   Subject to :

   $$3x_1 - 3x_2 + 5x_3 \leq 3$$
   $$2x_1 - 6x_2 \leq 4$$
   $$4x_1 - x_3 \leq 5$$
   $$x_1, x_2, x_3 \geq 0$$

d) Find an initial basic feasible solution of the following T.P. by North West corner method.

Destination → Origin↓	D_1	D_2	D_3	D_4	Supply
O_1	3	4	6	3	30
O_2	3	5	7	10	50
O_3	2	6	5	7	70
Demand	22	41	44	43	

Also find the corresponding transportation cost.

e) Solve the following assignment problem for minimization

Machines

	A	B	C	D	E
I	1	2	3	0	1
II	2	1	2	5	7
Jobs III	8	9	10	1	2
IV	3	4	5	1	2

f) Solve the following game by dominance principle.

Player B

I II III IV V

Player A

$$\begin{array}{c} A \\ B \\ C \\ D \end{array} \begin{bmatrix} 3 & 5 & 4 & 9 & 6 \\ 5 & 6 & 3 & 7 & 8 \\ 8 & 7 & 9 & 8 & 7 \\ 4 & 4 & 8 & 5 & 3 \end{bmatrix}$$

Q3) Attempt any four of the following :   **[16]**

a) Explain the following terms in PERT / CPM :
   i)   Latest time
   ii) Earliest time
   iii) Critical Path
   iv) Total activity time

b) A firm can produce three types of clothes say A, B, and C. The clothes are made of three colours of wools say, red, green and blue. One unit of cloth A needs 2 meters of red wool and 3 meters of blue wool; one unit of cloth B requires 3 meters of red wool, 2 meters of green and 2 meters of blue wool and one unit of cloth C requires 5 meters of green wool and 4 meters of blue wool. The firm has only a stock of 800 meters of red wool, 1000 meters of green wool and 1500 meters of blue wool. Suppose that the profit per unit of clothes A, B and C is Rs. 3, Rs. 4 and Rs. 5 respectively.

Determine how the firm should use the available material, so as to maximize the income from the finished clothes.

c) Define the following terms with reference to Transportation problems.

i) Balanced T.P.

ii) Feasible Solution

iii) Optimal Solution

iv) Dummy Source

d) Convert the following transportation problem into linear programming problem.

Destination → Origin↓	D_1	D_2	Supply
O_1	8	12	23
O_2	9	13	22
Demand	28	17	

e) Solve the following assignment problem for maximization

	Z_1	Z_2	Z_3	Z_4
S_1	7	12	37	18
S_2	25	27	18	25
S_3	16	3	17	23
S_4	10	25	14	9

f) Explain Vogel's Approximation method for obtaining an initial basic feasible solution of a transportation problem.

Q4) Attempt any two of the following : [16]

a) Discuss the role of sensitivity analysis in linear programming. Under what circumstances is it needed and under what conditions do you think it is not necessary?

b) Solve the following L.P.P. by Big - M method:

Maximize $Z = 3x_1 - x_2$

Subject to :

$$2x_1 + x_2 \geq 2$$
$$x_1 + 3x_2 \leq 3$$
$$x_2 \leq 4$$
$$x_1, x_2 \geq 0$$

c) Obtain an IBFS for the following transportation problem by VAM method.

From↓ \ To→	D_1	D_2	D_3	D_4	Supply
O_1	23	27	16	18	30
O_2	12	17	20	51	40
O_3	22	28	12	32	53
Demand	22	35	25	41	

Also find the Corresponding Transportation Cost.

Q5) Attempt any two of the following : [16]

a) Define the following terms :

i) Pure strategy   ii) Mixed strategy

iii) Saddle point   iv) Fair game

b) What is goal programming? Clearly state its assumptions.

c) Solve the following 2 × 2 game by algebraic method.

Player B

		I	II
Player A	I	5	10
	II	12	2

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