USN | | | | | | | | | | |

06MAT41

Fourth Semester B.E. Degree Examination, June/July 2011
Engineering Mathematics - IV

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting atleast TWO questions each from Part – A and Part - B.***

PART – A

1 a. Using Taylor's series method, find y at x = 0.1 and x = 0.2 considering upto 4th degree terms. Given that $\frac{dy}{dx} = x^2y - 1$ and y(0) = 1. **(06 Marks)**

b. Solve $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$ with y(0) = 1, find y at x=0.2 using Runge – Kutta method of 4th order taking step – length h = 0.2 accurate upto 4th decimal place. **(07 Marks)**

c. Given that $\frac{dy}{dx} = x^2(1+y)$ and y(1) = 1 ; y(1.1) = 1.233 ; y(1.2) = 1.548 ; y(1.3) = 1.979, find y at x = 1.4 using Adams – Bashforth predictor and corrector formula. **(07 Marks)**

2 a. Find Analytic function whose real part is $u = x^2 - y^2 + \frac{x}{x^2 + y^2}$. **(06 Marks)**

b. Under the transformation $W = e^Z$, prove that family of lines parallel to y – axis in Z – plane transforms into family of concentric circles in W – plane. **(07 Marks)**

c. Find Bilinear transformation, that transforms Z = -1, i, 1 on to points W = 1, i, -1, in W – plane respectively. Also find invariant points. **(07 Marks)**

3 a. Evaluate $\int_C \frac{e^{2Z}}{(Z+1)(Z+2)} dZ$, where 'C' is a circle | Z | = 3. **(06 Marks)**

b. Obtain the power series which represents the function $f(Z) = \frac{Z^2 - 1}{Z^2 + 5Z + 6}$ in the region $2 < |Z| < 3$. **(07 Marks)**

c. Using Cauchy's Residue theorem evaluate $\int_C \frac{2Z^2 + 1}{(Z+1)^2(Z-2)} dZ$, where 'C' is circle with | Z | = 3. **(07 Marks)**

4 a. Using Frobenius series solution method, solve $\frac{d^2y}{dx^2} + xy = 0$. **(06 Marks)**

b. Reduce the differential equation $x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} + (k^2x^2 - n^2)\,y = 0$ into Bessel's form and write the complete solutions for n is not integral or zero. **(07 Marks)**

c. Express the polynomial $2x^3 - x^2 - 3x + 2$ in terms of Legendre's polynomial. **(07 Marks)**

PART – B

5 a. Fit the best possible curve of the form $y = a + bx$, using method of Least square for the data: **(06 Marks)**

X :	1	3	4	6	8	9	11	14
Y :	1	2	4	4	5	7	8	9

b. The lines of regressions are $x + 2y = 5$ and $2x + 3y = 8$. Find i) means of the variables x and y ii) correlation coefficient between x and y. **(07 Marks)**

c. Three typists A, B, C typed 50%, 30% and 20% of pages of a book. The percentage of defectively typed pages by them is 3, 4, 5 respectively. If a page is selected from the book at random, what is the probability that it is defectively typed and it is typed by 'A'? **(07 Marks)**

6 a. The random variable X has the following probability mass function

X :	0	1	2	3	4	5
P(X) :	K	3K	5K	7K	9K	11K

i) find K ii) find $P(X < 3)$ iii) find $P(3 < X \leq 5)$. **(06 Marks)**

b. Alpha – particles are emitted by a radio active source at an average of 5 emissions in 20 minutes. What is the probability that there will be i) exactly two emissions ii) at least two emissions in 20 minutes? **(07 Marks)**

c. A sample of 100 dry battery cells tested to find the length of life produced by a company and following results are recorded : mean life = 12 hours, standard deviation = 3 hours. Assuming data to be normally distributed, find the expected life of a dry cell :
i) have more than 15 hours ii) between 10 and 14 hours. **(07 Marks)**

7 a. Explain the following terms : i) Null hypothesis ii) Standard error iii) Test of significance. **(06 Marks)**

b. Find the range of number of heads out of 64 tosses of a coin which will ensure fairness of coin at 5% level of significance using binomial distribution. **(07 Marks)**

c. A survey conducted on 64 families with 3 children each and recorded as follows :

No. of Male children :	0	1	2	3
No. of families :	6	19	29	10

Apply Chi – Square test to test whether male and female children are equiprobable at 5% level of significance. **(07 Marks)**

8 a. The Joint probability distribution of two Random variable X and Y are given as :

X \ Y	1	3	9
2	$\frac{1}{8}$	$\frac{1}{24}$	$\frac{1}{12}$
4	$\frac{1}{4}$	$\frac{1}{4}$	0
6	$\frac{1}{8}$	$\frac{1}{24}$	$\frac{1}{12}$

i) find Marginal distribution of X and Y ii) find COV(X,Y). **(06 Marks)**

b. Find the unique fixed probability vector of the regular stochastic matrix.

$$A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ \frac{1}{2} & \frac{1}{2} & 0 \end{bmatrix}$$ **(07 Marks)**

c. A player's luck follows a pattern. If he wins a game the probability of winning next game is 0.6. However if he loses the game the probability of losing the next game is 0.7. There is an even chance of winning the first game. If so i) what is the probability of winning 2nd game ii) What is the probability of winning 3rd game? **(07 Marks)**

*****

USN | | | | | | | | | | |

06CS42

Fourth Semester B.E. Degree Examination, June/July 2011

Graph Theory and Combinatorics

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions selecting at least TWO questions from each part.***

PART – A

1 a. Define complete bipartite graph. How many vertices and how many edges are there $K_{4,7}$ and $K_{7,11}$? **(05 Marks)**

b. If a graph with n vertices and m edges is k-regular, show that m = kn/2. Does there exist a cubic graph with 15 vertices. **(05 Marks)**

c. Verify that the two graphs shown below in Fig.Q1(c)(i) and Fig.Q1(c)(ii) are isomorphic.

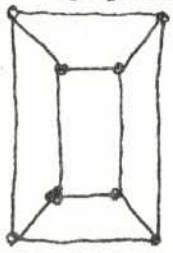

Fig.Q1(c)(i)

Fig.Q1(c)(ii) **(05 Marks)**

d. If G is a simple graph with no cycles, prove that G has atleast one pendant vertex. **(05 Marks)**

2 a. Prove that Petersen graph is non-planar. **(04 Marks)**

b. Prove that a connected planar graph G with n vertices and m edges has exactly m – n + 2 regions in every one of its diagrams. **(06 Marks)**

c. Show that every simple connected planar graph G with less than 12 vertices must have a vertex of degree ≤ 4. **(05 Marks)**

d. Prove that every connected simple planar graph G is 6 colourable. **(05 Marks)**

3 a. Prove that a tree with n vertices has n – 1 edges. **(07 Marks)**

b. Obtain a prefix code for the message 'ROAD IS GOOD', using lebelled binary tree and hence encode the message. **(07 Marks)**

c. Define a spanning tree of a graph. Find all the spanning trees of the following graph shown in Fig.Q3(c). **(06 Marks)**

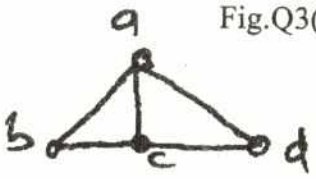

Fig.Q3(c)

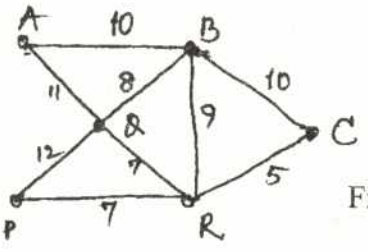

Fig.Q4(b)

4 a. Define : i) Cut set, ii) Edge connectivity, iii) Vertex connectivity. Give one example for each. **(06 Marks)**

b. Using Kruskal's algorithm, find a minimal spanning tree for the weighted graph shown in Fig.Q4(b). **(07 Marks)**

c. State and prove max-flow and min-cut theorem. **(07 Marks)**

PART – B

5 a. In how many ways one can distribute ten identical white marbles among six distinct containers? **(06 Marks)**

b. Prove the following identities :

i) $C(n+1, r) = C(n, r-1) + C(n, r)$

ii) $C(m+n, 2) - C(m, 2) - C(n, 2) = mn$. **(07 Marks)**

c. Determine the coefficient of :

i) xyz^2 in the expansion of $(2x - y - z)^4$

ii) $a^2b^3c^2d^5$ in the expansion of $(a + 2b - 3c + 2d + 5)^{16}$ **(07 Marks)**

6 a. There are 30 students in a hostel. In that 15 study history, 8 study economics, and 6 study geography. It is known that 3 students study all these subjects Show that 7 or more students study none of these subjects. **(06 Marks)**

b. In how many ways can one arrange the letters in CORRESPONDENTS so that:

i) There is no pair of consecutive identical letters.

ii) There are exactly two pairs of consecutive identical letters.

iii) There are atleast three pairs of consecutive identical letters? **(08 Marks)**

c. Define derangement. In how many ways we can arrange the numbers 1, 2, 3, ...10 so that 1 is not in the 1st place, 2 is not in the 2nd place and so on, and 10 is not in the 10th place? **(06 Marks)**

7 a. Determine the generating function for the numeric function :

$$a_r = \begin{cases} 2^r & \text{if r is even} \\ -2^r & \text{if r is odd} \end{cases}$$ **(06 Marks)**

b. Find the coefficient of x^{18} in the following products :

$$(x + x^3 + x^5 + x^7 + x^9)(x^3 + 2x^4 + 3x^5 + ...)^3$$ **(07 Marks)**

c. In how many ways can we distribute 24 pencils to 4 children so that each child gets at least 3 pencils but not more than eight? **(07 Marks)**

8 a. Solve the recurrence relation, $F_{n+2} = F_{n+1} + F_n$, given $F_0 = 0$ and $F_1 = 1$ and $n \geq 0$. **(06 Marks)**

b. Find the generating function for the relation $a_n + a_{n-1} - 6a_{n-2} = 0$ for $n \geq 2$, with $a_0 = -1$ and $a_1 = 8$. **(07 Marks)**

c. Find the general solution of $s(k) + 3s(k-1) - 4s(k-2) = 4^k$. **(07 Marks)**

* * * * *

USN | | | | | | | | | | |

06CS43

Fourth Semester B.E. Degree Examination, June/July 2011
Analysis and Design of Algorithms

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions form each part.***

PART – A

1 a. Explain notion of algorithm. Write Euclid's algorithm for computing gcd (m,n). **(07 Marks)**

b. Write and explain the steps of algorithm problem solving using flowchart. **(07 Marks)**

c. Define weighted graph. Give example and write its adjacency matrix. **(06 Marks)**

2 a. Explain the orders of growth and basic efficiencies classes of algorithms. **(06 Marks)**

b. Write and find the worst – case, best – case and average case efficiency of sequential – search algorithm. **(06 Marks)**

c. Explain the mathematical analysis of Fibonacci sequence recursive algorithms. **(08 Marks)**

3 a. Explain brute – force algorithm design strategy. Design analyze bubble – sort algorithm, with example. **(08 Marks)**

b. Explain the divide and conquer technique. Design and analyze quick sort algorithm, with example. **(12 Marks)**

4 a. Define tree traversal operations and traverse the following binary tree.

i) in preorder
ii) in-inorder
iii) in postorder. **(06 Marks)**

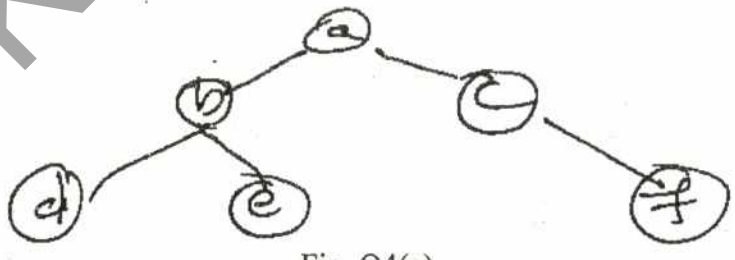

Fig. Q4(a)

b. Explain the stressen's matrix multiplication, with example. **(06 Marks)**

c. Write and explain DFS and BFS algorithm, with example. **(08 Marks)**

PART – B

5 a. Explain the transform and conquer technique. Design and analyze heap sort algorithm, with example. **(12 Marks)**

b. Explain the sorting by counting. Write algorithm comparison counting sort. Sort the list {62, 31, 84, 96, 19, 47}. **(08 Marks)**

6 a. Explain hashing and hashing techniques. **(06 Marks)**

b. Write and explain Floyd's algorithm for the all – pairs shoftest – paths problem, with example. **(09 Marks)**

c. Apply the dynamic programming following instance of the knapsack problem and solve.

Item	Weight	Valve
1	2	$ 12
2	1	$ 10
3	3	$ 20
4	2	$ 15

Capacity W = 5

(05 Marks)

7 a. Write and explain Prim's algorithm and apply Prim's algorithm for the following graph.

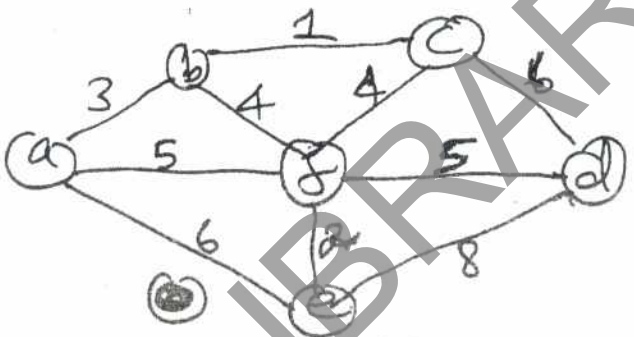

Fig. Q7(a) **(07 Marks)**

b. Write and explain Dijkstra's algorithms and apply the algorithm for the following graph.

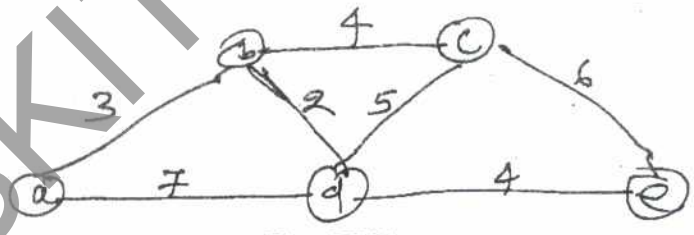

Fig. Q7(b) **(07 Marks)**

c. Define decision tree. Write decision tree for finding minimum of 3 – numbers. **(06 Marks)**

8 a. Explain P and NP problems, with examples. **(06 Marks)**

b. Explain the subset – sum problem, with example using backtracking method. **(07 Marks)**

c. Explain the traveling salesman problem with example using branch – bound method. **(07 Marks)**

* * * * *

USN | | | | | | | | | | |

06CS44

Fourth Semester B.E. Degree Examination, June/July 2011
Object Oriented Programming With C++

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART A

1 a. Give a comparison of C and C++ with an example. **(06 Marks)**
b. What is function overloading? Explain with an example. **(06 Marks)**
c. Define Objects. Create a class FLOWER with following characteristics : Name, Color, Price. Display the names of all flowers costing more than 25 rupees. **(08 Marks)**

2 a. Explain how you can overload member functions with an example. **(06 Marks)**
b. How you can make member functions inline? Give an example. **(06 Marks)**
c. Write a C++ program to sort the list of students depending on their holl numbers. **(08 Marks)**

3 a. What are the disadvantages of static allocation and deallocation? **(06 Marks)**
b. Explain constructors with an example. **(08 Marks)**
c. What are destructors? Give the prototype for destructors. What is the difference between constructors and destructors? **(06 Marks)**

4 a. What is inheritance? Mention different kinds of inheritance. Explain any two. **(08 Marks)**
b. Explain the order in which constructors and destructors are involved. **(06 Marks)**
c. Can friendship be inherited? Explain with example. **(06 Marks)**

PART B

5 a. Explain how you can define pure virtual functions with an example. **(06 Marks)**
b. Explain the class hierarchy for handling streams with a neat diagram. **(08 Marks)**
c. Explain how you can create virtual functions with an example. **(06 Marks)**

6 a. Write short notes on :
i) Role of eofbit, failbit and badbit in error handling
ii) The eof( ) function **(06 Marks)**
b. What are the rules for operator overloading? Explain briefly. **(08 Marks)**
c. Explain how you can overload relational operators through friend function. **(06 Marks)**

7 a. Explain the overloading of 'new' and 'delete' operators. **(08 Marks)**
b. Explain how assignment operator is overloaded. **(06 Marks)**
c. Explain the overloading of insertion operator. **(06 Marks)**

8 a. What are new style cast operators? Give general syntax. **(06 Marks)**
b. Give the general syntax for creating function templates. Explain with an example. **(06 Marks)**
c. Explain overloading of a function template with an example. **(08 Marks)**

* * * * *

USN | | | | | | | | | | |

06CS45

Fourth Semester B.E. Degree Examination, June/July 2011
Microprocessors

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions selecting atleast two from each part.***

PART – A

1 a. Briefly discuss the types of microprocessors. **(06 Marks)**

b. Explain with neat diagram the internal architecture of 8086 microprocessor. Clearly state the functions of the following :
i) E.U. ii) B. I. U iii) Segment registers. **(10 Marks)**

c. Explain immediate and direct addressing modes with suitable examples. **(04 Marks)**

2 a. Write and explain template for 8086 MOV instruction. Also generate the opcode for the following instructions.
i) MOV AX, BX ii) MOV AX, [BX]. **(08 Marks)**

b. Explain briefly Editor. Assembler and debugger.

c. Define the function of following assembler directives with example. **(06 Marks)**
i) SEGMENT AND ENDS ii) DT iii) GLOBAL iv) INCLUDE v) PTR. **(06 Marks)**

3 a. Discuss the different types of 8086 unconditional jump instructions with an example for each type. **(08 Marks)**

b. Write an ALP to sort a given set of N numbers in ascending order using bubble sort algorithm. **(06 Marks)**

c. Write a delay procedure for producing a delay of 1 msec. for 8086 microprocessor working at 5 MHz. **(06 Marks)**

4 a. Write a procedure to convert a packed BCD number to its binary equivalent. Use method of passing parameters in registers. **(08 Marks)**

b. Differentiate between macros and procedures. **(06 Marks)**

c. Explain REPE CMPSB instruction with an example. **(06 Marks)**

PART – B

5 a. Explain the following instructions with an example for each.
i) AAM ii) LOOP iii) CWD iv) IRET v) XCHG. **(10 Marks)**

b. Write an ALP to generate first 'N' Fibonacci numbers. **(06 Marks)**

c. Write the correct format (syntax) for the following instructions
i) OUT AL, 86H ii) PUSH DL iii) MOV AL, F3H iv) ROL AL, 04H. **(04 Marks)**

6 a. Explain minimum mode configuration of 8086 with a neat diagram. **(08 Marks)**

b. Explain with a neat diagram the bus activities during a memory read machine cycle. **(08 Marks)**

c. Bring out the differences between 8086 and 8088 microprocessors. **(04 Marks)**

7 a. With any two examples explain hardware interrupt applications. **(10 Marks)**

b. Explain the working of 8259 with its internal block diagram and all the ICWs. **(10 Marks)**

8 a. Explain the different operational modes of 8255 along with its internal block diagram. **(10 Marks)**

b. Explain the different types of 8255 control word formats. Write the control words to initialize 8255 as follows :
Port B as mode '1' input, port A as mode '0' output, port C upper as input and port C bit 3 as output. **(10 Marks)**

* * * * *

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

USN | | | | | | | | | | |

06CS46

Fourth Semester B.E. Degree Examination, June/July 2011
Computer Organization

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions selecting atleast TWO questions from each part.***

PART – A

1 a. Write the basic performance equation. Explain the role of the parameters on the performance of the computer. **(05 Marks)**

b. Mention four types of operations required to be performed by instruction in a computer. What are the basic types of instruction formats? Give an example for each. **(06 Marks)**

c. What is straight line sequencing? Explain with an example. **(04 Marks)**

d. What are condition code flags? Explain the four commonly used flags. **(05 Marks)**

2 a. Define an addressing mode. Explain the following addressing modes with example : indirect indexed, relative, and auto increment. **(05 Marks)**

b. Registers R1 and R2 of a computer contain the decimal values 1400 and 5000. What is the effective address of the memory operand in each of the following instructions? Assume that the computer has 32 bit word length.

i) Load 20(R1), R5
ii) Move # 3000, R5
iii) Store 30(R1, R2), R5
iv) Add (R2)+, R5
v) Subtract – (R1), R5. **(05 Marks)**

c. Explain the operation of stack, with an example. Give any three differences between stacks and queues. **(10 Marks)**

3 a. Define memory mapped input/output and input/output mapped input/output, give one advantages of each. **(05 Marks)**

b. In a situation where a number of devices capable of initiating interrupts are connected to the processor.

i) How can the processor recognize the device requesting on interrupt?
ii) How should two or more simultaneous interrupt requests be handled? **(10 Marks)**

c. Explain a synchronous bus. Also give the timing diagram of an input transfer on a synchronous bus. **(05 Marks)**

4 a. Explain with a sketch the read operation performed on a peripheral component interconnect bus. Show the role of IRDY #, and TRDY#. **(10 Marks)**

b. What are the design objectives of the USB? **(03 Marks)**

c. Explain the following with respect to USB.

i) USB addressing
ii) USB protocols. **(07 Marks)**

PART – B

5 a. Draw the organization of a 4K × 1 memory cell and explain. **(08 Marks)**

b. Explain direct mapping and associative mapping between cache memory and main memory. **(10 Marks)**

c. Differentiate between SRAM and DRAM. **(02 Marks)**

6 a. Explain in detail, the working principle of a magnetic hard disk. **(10 Marks)**

b. Draw a block diagram and explain how a virtual address form the processor is translated into physical address in the main memory. **(04 Marks)**

c. Draw a figure to illustrate a 16–bit carry look ahead adder using 4–bit adder blocks and explain its working principle. **(06 Marks)**

7 a. Explain Booth's algorithm, multiply–13 and + 11 using Booth's multiplication. **(10 Marks)**

b. Explain the IEEE standard for floating point number representation. **(10 Marks)**

8 a. Explain the process of fetching a word from memory with the help of a timing diagram. **(10 Marks)**

b. List the actions needed to execute the instruction Add R1, (R3). Write the sequence of control steps to perform the actions for a single bus structure. Explain the steps. **(10 Marks)**

* * * * *

USN | | | | | | | | | | |

MATDIP401

Fourth Semester B.E. Degree Examination, June/July 2011
Advanced Mathematics – II

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. Find the angle between any two diagonals of a cube. **(06 Marks)**

b. Show that the angle between the lines whose direction ratios are 2, 1, 1 and 4, $\sqrt{3}-1$, $-\sqrt{3}-1$ is 60°. **(07 Marks)**

c. Find the value of K such that the set of four points (0, -1, -1) (-4, 4, 4) (k, 5, 1) and (3, 9, 4) are co-planar. **(07 Marks)**

2 a. Derive the equation of the plane in the intercept form $\frac{x}{a}+\frac{y}{b}+\frac{z}{c}=1$. **(06 Marks)**

b. Find the equation of the plane which passes through the point (3, -3, 1) and is perpendicular to the planes $7x + y + 2z = 6$ and $3x + 5y - 6z = 8$. **(07 Marks)**

c. Show that the lines : $\frac{x+3}{2}=\frac{y+5}{3}=\frac{z-7}{-3}$ and $\frac{x+1}{4}=\frac{y+1}{5}=\frac{z+1}{-1}$ are coplanar and hence find the equation of the plane in which they lie. **(07 Marks)**

3 a. Find a unit vector perpendicular to both the vectors $\vec{A}=2\hat{i}+\hat{j}-\hat{k}$ and $\vec{B}=\hat{i}-\hat{j}+2\hat{k}$. **(06 Marks)**

b. If $\vec{a},\vec{b},\vec{c}$ are any three vectors, prove that :

i) $[\vec{a}+\vec{b},\vec{b}+\vec{c},\vec{c}+\vec{a}]=2[\vec{a},\vec{b},\vec{c}]$

ii) $[\vec{b}\times\vec{c},\vec{c}\times\vec{a},\vec{a}\times\vec{b}]=[\vec{a},\vec{b},\vec{c}]^2$ **(07 Marks)**

c. Find the value of λ so that the vectors $\vec{a}=2\hat{i}-3\hat{j}+\hat{k}$ $\vec{b}=\hat{i}+2\hat{j}-3\hat{k}$ and $\vec{c}=\hat{j}+\lambda\hat{k}$ are coplanar. **(07 Marks)**

4 a. A particle moves along a curve $x = t^3 - 4t$, $y = t^2 + 4t$, $z = 8t^2 - 3t^3$ where t is the time variable. Determine its velocity and acceleration vectors and also the magnitudes of velocity and acceleration at t = 2. **(06 Marks)**

b. Find the angle between the surfaces $x^2 + y^2 + z^2 = 9$ and $x = z^2 + y^2 - 3$ at the point (2, -1, 2). **(07 Marks)**

c. Find the directional derivative of $\phi = xy^2 + yz^3$ at (2, -1, 1) in the direction of vector $\hat{i}+2\hat{j}+2\hat{k}$. **(07 Marks)**

5 a. Find the divergence and curl of the vector $\vec{F}=(3x^2y-z)\hat{i}+(xz^3+y^4)\hat{j}-(2x^3z^2)\hat{k}$. **(06 Marks)**

b. If $\vec{r}=x\hat{i}+y\hat{j}+z\hat{k}$ show that i) $\nabla.\vec{r}=3$; ii) $\nabla\times\vec{r}=0$. **(07 Marks)**

c. Find the constants a, b, c, such that the vector field $\vec{f}=(x+y+az)\hat{i}+(bx+2y-z)\hat{j}+(x+cy+2z)\hat{k}$ is irrotational. **(07 Marks)**

6 Find :

a. $L(4\sinh 5t - 5\cos 4t)$ **(05 Marks)**

b. $L(\cos at \cos bt)$ **(05 Marks)**

c. $L(e^{-t}\cos^2 t)$ **(05 Marks)**

d. $L(te^{-t}\sin t)$ **(05 Marks)**

7 Find :

a. $L^{-1}\left[\frac{1}{s+3}+\frac{3}{2s+7}-\frac{5}{3s-z}\right]$ **(05 Marks)**

b. $L^{-1}\left[\frac{2s+1}{(s-2)(s-3)}\right]$ **(05 Marks)**

c. $L^{-1}\left[\frac{s}{s^2+6s+13}\right]$ **(05 Marks)**

d. $L^{-1}\left[\log\left(\frac{s+1}{s-1}\right)\right]$ **(05 Marks)**

8 a. Using Laplace transform method solve, $\frac{d^2y}{dt^2}+\frac{3dy}{dt}+2y=0$ under the conditions $y(0)=1, y'(0)=0$. **(10 Marks)**

b. Solve by using Laplace transforms $\frac{dx}{dt}+y=\sin t$, $\frac{dy}{dt}+x=\cos t$, $x=1$, $y=0$ at $t=0$. **(10 Marks)**

* * * * *