NTK/KW/15–7326

Third Semester B. E. (C.S.E.) (C.B.S.) Examination

ADVANCED C PROGRAMMING AND LOGIC DESIGN

Time : Three Hours] [Max. Marks : 80

N. B. : (1) All questions carry marks as indicated.

(2) Solve **Six** questions as follows :
Que. No. 1 OR Que. No. 2
Que. No. 3 OR Que. No. 4
Que. No. 5 OR Que. No. 6
Que. No. 7 OR Que. No. 8
Que. No. 9 OR Que. No. 10
Que. No. 11 OR Que. No. 12

(3) Assume suitable data wherever necessary.

1. (A) Write a program to convert a 5 x 5 given matrix into lower triangular matrix. 7

(B) Write a program to concatenate two strings without using standard library function. 7

OR

2. (A) Differentiate between structure and union with examples of each. 4

(B) Explain sizeof ( ) and enumerated data types. 4

(C) Write a program to accept marks of 50 students in a subject with rollno, name and marks and calculate total and average marks using pointer to structure. 6

3. (A) Explain the concept of command line argument with example. 6

(B) Given a text file sample. txt, create another file deleting all the vowels from it. 7

OR

4. (A) Explain the following C functions :—

(i) Ferror ( )

(ii) Feof ( )

(iii) Fprintf ( )

(iv) Fread ( ) 6

(B) Write a program to remove all comments from a C program file. 7

5. (A) Differentiate between call by value and call by reference. Also write a program to swap two valueusing call by value and call by reference. 7

(B) Write a recursive function to get the n^{th} term of Fibonacci series. 6

OR

6. (A) Explain with example the difference between :–

(1) Array of pointers and

(2) Pointer to Array. 5

(B) Write a program using pointers to reverse a string without using standard library function. 8

7. Explain the following graphics functions with syntax and examples.

(i) arc ( )

(ii) Putimage ( )

(iii) getmaxy ( )

(iv) graphics defaults ( )

(v) lineto ( ) 13

OR

8. (A) Write a program in C to draw a polygon passing through the points given below and fill with colour

(100,100) (200,50) (300, 200) and (150, 250) 6

(B) Write a program in C to draw a chain of four circle in a horizontal line such that each new circle passes with the centre of the previous circle. 7

9. (A) Prove the following using Mathematical Induction.

$$1^3 + 2^3 + 3^3 + ... + n^3 = \left[\frac{n(n+1)}{2} \right]^2$$ 7

(B) List and discuss computational model in detail. 7

OR

10. (A) Write an algorithm to find smallest and largest element from a list of 10 elements. 7

(B) Make the following complexity analysis for linear search operation of a list of size N. which one is

significant :—

(i) Best case

(ii) Average case

(iii) Worst case. 7

11. (A) What is object oriented programming ? How it differs from procedure oriented programming. 5

(B) Explain the following with respect to object oriented programming :—

(i) Late binding.

(ii) Encapsulation.

(iii) Inheritance.

(iv) Object. 8

OR

12. Write short notes on :—

(i) Assertion and loop invariants. 4

(ii) Properties of Algorithm. 4

(iii) Model of computation. 5

B.E. (Computer Science & Engineering (New)) Third Semester (C.B.S.)

Advance C & Programming Logic Design

Paper - II

P. Pages : 2 **TKN/KS/16/7326**

Time : Three Hours * 1 0 8 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2
3. Solve Question 3 OR Questions No. 4
4. Solve Question 5 OR Questions No. 6
5. Solve Question 7 OR Questions No. 8
6. Solve Question 9 OR Questions No. 10
7. Solve Question 11 OR Questions No. 12
8. Assume suitable data whenever necessary.
9. Use of non programmable calculator is permitted.

1. a) Explain any four library function in "String.h" with example. **8**

b) Write a program to find whether a given 3 x 3 matrix is upper triangular or not. **6**

OR

2. a) Write a.c. program to accept name and salary of 30 employee. Find highest salary, lowest salary and average salary. **8**

b) Differentiate between structure and union. **3**

c) Explain : **3**
i) Enumerations ii) Size of iii) Type def

3. a) Given a text file xyz.txt. Create another file pqr.txt containing all the content of xyz.txt except deleting vowels. **7**

b) Explain following function, using example. **6**
i) fseek ii) ftell iii) feof

OR

4. a) A file input.txt contains number. Read this file and separate the even and odd numbers into two different files named as even.txt and odd.txt. **7**

b) Explain with suitable example the concept of command line argument. **6**

5. a) Write a function large( ) to find largest element from an array of size n using pointer. **6**

b) Write a user defined function to reverse a string using pointer. **7**

OR

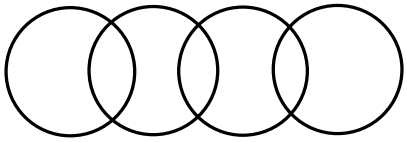
6. a) Write short notes on :

i) Dynamic memory allocation. **5**

ii) Pointer to array and array of pointers. **4**

iii) Pointer within structure. **4**

7. a) Write a program using C graphics to draw the following AUDI symbol. **7**



b) Write a menu driven program to draw arc, sector, polygon & ellipse. **7**

OR

8. a) Explain initgraph( ) in detail. **4**

b) Explain following graphics functions. **10**

i) closegraph( ) ii) settextstyle( )
iii) lineto( ) iv) linerel( )
v) fillpoly( )

9. a) Using mathematical induction prove that **7**

$$1^3 + 2^3 + 3^3 + ...n^3 = \left[\frac{n(n+1)}{2}\right]^2$$

b) On what parameters algorithms are evaluated ? Explain those parameters & calculate it for selection sort. **6**

OR

10. Write short notes on :

i) Computational model. **5**

ii) Properties of algorithm. **4**

iii) Notion of algorithm. **4**

11. a) What is object oriented programming ? How it differs from procedure oriented programming ? Explain various features of OOP. **8**

b) Explain Assertion and loop Invariants. **5**

OR

12. a) Explain imperative procedural and declarative programming with example. **7**

b) Write a program to create a structure student with field roll no, name, marks in 3 subjects, percentage. Input these value for 3 students and display it. **6**

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B.E. (Computer Science & Engineering) (New) Semester Third (C.B.S.)

Advanced C & Programming Logic Design Paper – II

P. Pages : 2 **KNT/KW/16/7238**

Time : Three Hours * 0 9 1 1 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.

1. a) Write a program to find transpose of a matrix. **6**

b) What is array? What are the different types of the array. Draw memory map for 1-D and 2-D array. **7**

OR

2. a) Write a program to check whether entered string is palindrome or not. **7**

b) Explain following with example. **6**
i) Enumerations ii) Typedef

3. a) Write a program to count number of words, vowels, consonants and other characters from a file. **8**

b) Explain what are command line arguments with example. **5**

OR

4. a) Write a program to create abc. txt and xyz. txt and merge content of abc.txt & xyz.txt into a file pqr.txt. **8**

b) Explain syntax of fopen ( )? What are different file opening modes. **5**

5. a) Write a user defined function to copy one string into another string using pointer. **7**

b) Write a program to find largest element from an array using pointers. **6**

OR

6. a) Write short note on.
i) Dynamic memory allocation. **5**

ii) Static memory allocation. **4**

iii) Pointer to array and array of pointers. **4**

7. a) Write a program to draw the pentagon and fill it with different colors. every time a key is pressed. Program should terminate when escape key is pressed. **8**

b) Explain initgraph( ) with syntax & example in detail. **6**

OR

8. a) Write a menu driven program to draw line, circle, rectangle, ellipse & arc on the screen. **8**

b) What is the difference between graphics mode & text mode. **3**

c) Explain syntax of "Putimage" with example. **3**

9. a) Using mathematical induction prove that **7**

$$1^3 + 2^3 + 3^3 + - - - - n^3 = \left[\frac{n(n+1)}{2}\right]^2$$

b) On what parameters algorithms are evaluated? Explain those parameters. **6**

OR

10. Write short note on.

i) Computational model. **5**

ii) Properties of algorithm. **4**

iii) Notion of algorithm. **4**

11. a) Explain basics of imperative style programming. **7**

b) Explain Assertions and loop invariants with example. **7**

OR

12. a) Declare a structure of an employee and accept 10 elements from user having fields emp-id emp-name, emp-dept, emp-basic, emp-gross. Find gross salary of an individual employee using formula. **8**
Gross salary = HRA + DA where
HRA = 20% of Basic salary
DA = 90% of Basic salary

b) What is OOP? How it differs from Procedure oriented programming. **6**

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B.E.Third Semester (Computer Science & Engineering (New)) (C.B.S.)

Advanced C & Programming Logic Design

P. Pages : 2 **NKT/KS/17/7238**

Time : Three Hours * 0 2 8 0 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.
11. Use of non programmable calculator is permitted.

1. a) What is an Array? Explain how one dimensional and two dimensional arrays are stored in memory, Give example of each. **6**

b) Write a program to reverse string without using string handing function. **7**

OR

2. a) Write a program to add two matrices & store the result in third matrix. **7**

b) Differentiate between structure & union. **6**

3. a) Explain following with syntax & example. **8**

i) getc ( ) ii) fseek ( )

iii) fwrite ( ) iv) fscanf ( )

b) Write a program to copy abc.txt file into xyz.txt file. **6**

OR

4. a) Given a text file soript.txt, create another file deleting all the vowels. **8**

b) What are the different types of file? Also explain different opening modes of file. **6**

5. a) Explain with example, the difference between pointer to structure and pointer within structure. **5**

b) Write short note on:

i) Static memory allocation. **3**

ii) Dynamic memory allocation. **3**

iii) Array of pointers. **3**

OR

6. a) What is pointer? state its advantages. Also give details of pointer arithmetic. **7**

b) Write a program to print greatest numbers in an array using pointers. **7**

7. a) Write a program in c-to draw five concentric circles and fill the inner most circle with BLUE color. **7**

b) What is the difference between graphic mode & text mode. **3**

c) Explain Initgraph ( ) in detail, using example. **3**

OR

8. a) Explain video Adopter in detail. **7**

b) Explain following functions using example. **6**
i) moverel ( ) ii) moveto ( )

9. a) Compute time and space complexity for bubble sort method. **7**

b) Prove the following by Mathematical Induction. **6**
$0^2 + 1^2 + 2^2 + 3^2 + - - - - - n^2 = \frac{n(n+n)(2n+1)}{6}$.

OR

10. a) Explain basic models of computation. **7**

b) Explain the following. **6**

i) Iterative Vs Recursive process.
ii) Functional programming.

11. a) Create a class rectangle with private data members. Length & breadth and public member function, get data ( ) to get length & breadth, Also a member function area ( ) to print area of rectangle, write main ( ) function that create an object of rectangle and print area of rectangle. **6**

b) Write short notes on.

i) Assertion & loop invariant. **4**
ii) Top down & bottom up design. **3**

OR

12. a) Explain object-oriented programming features in details. **8**

b) Differentiate between structured programing and object oriented programming. **5**

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B.E. (Computer Science & Engineering (New)) Third Semester (C.B.S.)

Advanced C & Programming Logic Design

P. Pages : 3 **NRJ/KW/17/4378**

Time : Three Hours * 0 5 1 2 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.

1. a) Write a function which accepts a string and an integer number 'n'. The function should print that string 'n' number of times and return the length of the string. Print the length of the string in calling function i.e. main ( ). **7**

b) Illustrate the use of following with an example of each. **6**

i) Enumerated datatype

ii) Size of

iii) type def

OR

2. a) Write a program which accepts a matrix and checks whether that matrix is lower triangular. Display an appropriate message on output screen. **7**

b) Explain the difference between array and structure. **3**

c) Can we create an array of structure, in C? Justify your answer with the help of an example. **3**

3. A file student.dat contains information of several students in terms of rollno, name, sessional marks, PUT marks and percentage scored. Write a program which performs following operations on the file. **14**

i) Add a new students record to the file.
ii) Print the information of student with highest percentage.
iii) Calculate and store internal marks of each student, where, intermarks = (sessional marks + PUT marks).

OR

4. a) Illustrate the use of error handling functions in file operations, with a suitable example. **7**

b) A file numbers. dat contains several integer numbers. Write a program to add all odd numbers from the file and display the sum on output screen. **7**

5. a) Write a program to create an integer array and print the smallest element of that array. How would you dynamically change the size of that array, if needed. **9**

b) Consider an integer array **4**
$\text{int a}[5] = \{1, 2, 5, 3, 10\}$ and a pointer 'ptr' which points to base address of the array 'a'. Suppose the pointer 'ptr' is incremented by 2. Where will the 'ptr' point now? Use appropriate pointer arithmetic rule and justify your answer.

OR

6. a) Explain the advantages of Dynamic memory allocation over static memory allocation. **4**

b) Explain a situation where you will use : **2+4**

i) Pointer within structure.

ii) Pointer to structure.

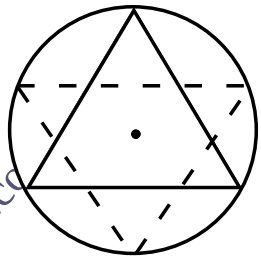
c) Write the meaning of 'm' in each of the following. **3**

i) $\text{float} * (*\text{m})( )$

ii) $\text{int} * \text{m}[5]$

iii) $\text{char m}(\text{long} *)$

7. a) Write a program to display following figure on graphics screen. **8**



b) Demonstrate the use of following functions in graphics. **6**

i) initgraph ( )

ii) ellipse ( )

iii) line to ( )

OR

8. a) Illustrate the use and difference between fillpoly ( ) and drawpoly ( ) with the help of an example. **6**

b) Write a program to draw circle, ellipse, line are on user choice. **8**

9. a) What is the use of models of computation in Computer Science? Explain the various models of computation in brief. **7**

b) Differentiate between iterative and recursive style of programming. Demonstrate an example for the same. **6**

OR

10. a) Explain with an example how mathematical induction is used to prove program correctness in Computer Science. Hence prove $1^2 + 2^2 + 3^2 + ...n^2 = \frac{n(n+1)2n+1)}{6}$. **7**

b) What is the need to measure time complexity of an algorithm? What are the different asymptotic notations and what is their use? **6**

11. a) How to use Assertions and loop invariants to check correctness of a program? Write an example of each. **8**

b) Write the difference between object Oriented Programming and Procedural Programming. **5**

OR

12. a) Give an example where you would use **5**

i) top - down design and ii) Bottom - up design

b) Explain the following features of object oriented programming **8**

i) Class

ii) Object

iii) Encapsulation

iv) Polymorphism.

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B.E. (Computer Science & Engineering (New)) Third Semester (C.B.S.)

Advanced C & Programming Logic Design

P. Pages : 2 **NJR/KS/18/4378**

Time : Three Hours * 0 1 3 6 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
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3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.

1. a) What is an array? Explain how one dimensional and two-dimensional array are stored in memory. Give example of each. **7**

b) Write a program to find transpose of a matrix. **6**

OR

2. a) What are structures? Give different way to declared them. When does compiler know to reserve space in memory for members of structures. **7**

b) Explain **any three.** **6**
i) Enumeration.
ii) Typedef.
iii) Bitfield.
iv) Sizeof.

3. a) Write a program to copy abc.txt file into xyz.txt file. **5**

b) Explain topen( ) function in detail with proper example. **5**

c) List various error handling function in files. **4**

OR

4. a) Write a program to count number of lines, words present in the file "PQr.txt" **5**

b) Explain command line argument with example. **5**

c) Write following function: **4**
i) ftell( )
ii) ferror( )
iii) fputs( )
iv) fclose( )

5.	a)	Compare static memory allocation with dynamic memory allocation.	**7**
	b)	Explain calloc( ), malloc( ), realloc( ), and free( ) function with syntax.	**6**

OR

6.	a)	What are pointers? Also explain pointer arithmetic and pointers operators.	**7**
	b)	Write a program to swap two numbers using pointer.	**3**
	c)	Differentiate pointer to structure and structure pointer.	**3**
7.	a)	What is the difference between graphics mode and text mode.	**5**
	b)	Explain initgraph( ) and closegraph( ) with example.	**5**
	c)	Explain video Adapter in detail.	**3**

OR

8.	a)	Write a menu driven program to draw line, circle, rectangle, ellipse and arc on the screen.	**7**
	b)	Write a program to draw five chains of circles with different colors.	**6**
9.	a)	Compare recursion and iteration.	**5**
	b)	Define model of computation. List and explain various model of computations.	**5**
	c)	Explain notion of algorithm.	**4**

OR

10.	a)	What are the correctness and efficiency issues in programming. Explain in detail.	**8**
	b)	Difference between iterative approach and functional approach with respect to following: i) Programmer focus. ii) State changes. iii) Order of execution.	**6**
11.	a)	List and discuss features of object oriented programming.	**7**
	b)	Explain imperative procedural and declarative programming with example.	**6**

OR

12.	a)	Explain in detail Assertion and loop invariants.	**7**
	b)	Write a program to create a structure student with field roll no, name and marks with 5 subjects and calculate percentage, result and grade and display it in proper form.	**6**

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B.E. (Computer Science & Engineering (New)) Third Semester (C.B.S.)

Advanced C Programming & Logic Design

P. Pages : 2 **NIR/KW/18/3323**

Time : Three Hours * 1 8 9 4 * Max. Marks : 80

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7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Differentiate between structure and union with example. **6**

b) Write a program to find and display largest and smallest element in 1D Array. **7**

OR

2. a) Write a program to generate transpose of a matrix. **6**

b) Explain following string functions with example. **7**

i) strlen ( ) ii) strcpy ( )
iii) strrev ( ) iv) strcmp ( )

3. a) Write a program to read a number from file and calculate and display its factorial. **7**

b) What are the different types of files? Also explain various file opening modes? **7**

OR

4. a) Explain following file functions with example. **8**

i) fgetc ( ) ii) fscanf ( )
iii) fputs ( ) iv) fprintf ( )

b) Write a program to copy the content of one file into another. **6**

5. a) Write a program to explain pointer within structure. **7**

b) What is pointer? Explain how you can initialize a structure using pointer? **6**

OR

6. a) Write a program to calculate addition of 1D Array elements using pointer to array. **7**

b) Explain with example how you can use a pointer for 1D and 2D array. **6**

7. a) Write a program to draw five concentric circles on screen. **6**

b) Explain with example : **8**

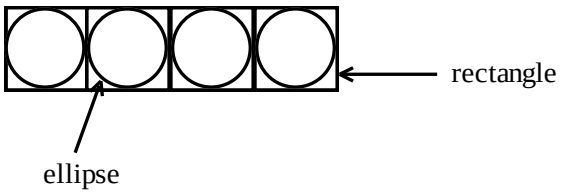
i) line ( ) ii) circle ( )

iii) rectangle ( ) iv) set color ( )

OR

8. a) Explain initgraph ( ), getmaxx ( ) and getmaxy ( ) graphic function in detail with example. **6**

b) Write a program to display below image on screen. **8**



Assume suitable data as parameter for graphic function.

9. a) Using mathematical induction, prove that **7**

$$1^3 + 2^3 + 3^3 + - - - - + n^3 = \left[\frac{n(n+1)}{2}\right]^2.$$

b) What is Algorithm? Explain properties of an Algorithm? **6**

OR

10. a) List and explain various computational model in detail. **7**

b) Differentiate between entry control and exit control loop with example. **6**

11. a) What is OOP? Explain its features in detail. **6**

b) Declare a structure bank with fields ACC-no, name, ACC-type, balance. Write a program to create at least 20 account in a bank and display complete detail available in bank. **7**

OR

12. a) Differentiate between procedural and object oriented programming. **6**

b) Write short notes on :

i) Time complexity. **4**

ii) Space complexity. **3**

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B.E. (Computer Science & Engineering) (New) Third Semester (C.B.S.)

Advanced C & Programming Logic Design

P. Pages : 2 **NRT/KS/19/3323**

Time : Three Hours * 0 1 9 3 * Max. Marks : 80

Notes :
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7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Can we create array of structure in 'C'? Justify your answer with example. **7**

b) Differentiate between structure and union. **6**

OR

2. a) Write a 'C' program to add two matrices & store the result in third matrix. **7**

b) Write a program to reverse string without using string handling function. **6**

3. a) Explain various error handling functions in file. **6**

b) Differentiate between text and binary modes of a file? Also explain different file opening modes. **7**

OR

4. a) Explain following I/O functions: **6**
i) fputc ( ) ii) fgetc ( )
iii) ftell ( )

b) Explain command line argument with suitable example. **7**

5. a) Compare static & dynamic memory allocation with example. **7**

b) Explain situation where we use. **7**
i) Pointer within structure.
ii) Pointer to structure.

OR

6. a) Write a program to print smallest number in an array using pointer. **7**

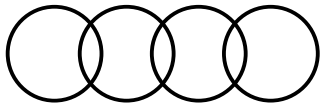
b) What is pointer ? State it's advantages. Also give details of pointer arithmetic. **7**

7. a) Write a menu driven program to draw rectangle, circle, ellipse & arc on the screen. **8**

b) Explain the following functions: **6**
i) initgraph ( ) ii) closegraph ( )

OR

8. a) Write a program using 'C' graphics to draw following symbol. **7**



b) Write a 'C' program to draw a polygon passing through the points as follows and also fill with colour 'RED'. (150,150) (210,100) (180,200) (120,200) and (100,120) **7**

9. a) Explain notion of algorithm. **3**

b) Define model of computation? List and explain various models of computation. **7**

c) Explain functional programming. **3**

OR

10. a) Prove the following by mathematical induction. **7**

$$1^2 + 2^2 + 3^2 + ------ + n^2 = \frac{n(n+1)(2n+1)}{6}$$

b) On what parameters algorithms are evaluated ? Explain those parameters. **6**

11. a) Explain Imperative and declarative programming with suitable example. **7**

b) Explain Assertion and loop invariants in detail. **6**

OR

12. a) List and discuss various features of object oriented programming. **7**

b) Create a class student having data members roll no, name, branch & marks in 4 subjects. Write appropriate function to read and display the value of data members. Also create a function to calculate result of a student in terms of percentage, grade and pass or fail. Depending on marks scored in 4 subjects. **6**

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