CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech II Semester Supplementary Examinations March/April-2023
Course Name: ODES & MULTIVARIABLE CALCULUS
(Common for all Branches)

Date: 21.03.2023 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Define an Integrating factor.	2 M
2.	State Newton's law of cooling.	2 M
3.	Find the complementary function of $(D^3 - D)y = x$	2 M
4.	Find the particular integral of $(D^2 + a^2)y = \cos ax$	2 M
5.	Evaluate $\int_0^1 \int_0^x e^x \, dx \, dy$	2 M
6.	Change the order of integration of $\int_0^1 \int_x^1 dx \, dy$	2 M
7.	If $\emptyset = x^2+y^2+z^2-3xyz$ then find grad$\emptyset$	2 M
8.	If $\bar{F} = yz\,\bar{\imath} + zx\,\bar{\jmath} + xy\,\bar{k}$ then find curl $\bar{F}$	2 M
9.	Define circulation.	2 M
10.	State Green's theorem in a plane.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). i) Solve $x\log x \frac{dy}{dx} + y = 2\log x$ 5M

ii) The number N of bacteria in a culture grew at a rate proportional to N. The value of N 5M
was initially 100 and increased to 332 in one hour. What was the value of N after $1\frac{1}{2}$ hour?

OR

11. B). i) Solve $2px = y - y^2p^3$ 5M
ii) Solve $(2x+e^y)\,dx + xe^y\,dy = 0$ 5M

12. A). Solve $(D^2-2D+1)y = x^2e^{3x} - \sin 2x + 3$ 10M

OR

12. B). Using method of variation of parameters, Solve $(D^2+4)y = \tan 2x$ 10M

13. A). Using polar coordinates, evaluate $\int_0^a \int_0^{\sqrt{a^2-x^2}} y\sqrt{x^2 + y^2}\ dx\, dy$ 10M

OR

13. B). Evaluate $\int_0^1 \int_0^{1-z} \int_0^{1-y-z} xyz\,dx\,dy\,dz$ 10M

14. A). i) Find the directional derivative of $x^2yz + 4xz^2$ at $(1,-2,-1)$ in the direction of $2\bar{\imath} - \bar{\jmath} - 2\bar{k}$ 5M
ii) Find p so that $\bar{f} = (x + 3y)\bar{\imath} + (y - 2z)\bar{\jmath} + (x + pz)\bar{k}$ is solenoidal.   5M

(P.T.O..)

OR

14. B). Show that $\bar{F} = (x^2-yz)\,\bar{\imath} + (y^2-zx)\bar{\jmath} + (z^2-xy)\bar{k}$ is Irrotational hence find its scalar potential   10M
function.

15. A). Evaluate $\int_S \bar{F} \cdot \bar{n}\ ds$ where $\bar{F} = 4xz\,\bar{\imath} - y^2\,\bar{\jmath} + yz\,\bar{k}$ where S is the surface of the cube   10M
bounded by x=0, x=a, y=0, y=a, z=0, z=a

OR

15. B). Verify Gauss divergence theorem for $\bar{F} = (x^3-yz)\,\bar{\imath} - 2x^2\,y\,\bar{\jmath} + z\bar{k}$ taken over the surface of   10M
the cube bounded by the planes x = a, y = a, z = a and coordinates planes

*****

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech II Semester Supplementary Examinations March/April-2023
Course Name: ENGINEERING CHEMISTRY
(Common for CE, EEE, ME, CSC, CSM, AID & AIM)

Date: 24.03.2023 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   **10x2=20M**

1.	Write any 4 postulates of Molecular Orbital Theory.	2 M
2.	List out any 2 salient features of crystal field theory.	2 M
3.	What is the role of salt bridge in galvanic cell?	2 M
4.	State and explain Pilling Bedworth rule.	2 M
5.	What do you understand by the term Chemical shift?	2 M
6.	Give any 4 applications of UV-Spectroscopy.	2 M
7.	Write a note on calgon conditioning.	2 M
8.	What do you mean by hardness of water? How do you classify it?	2 M
9.	Define chirality with an example.	2 M
10.	Write a note on Markownikoff's rules.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A).	Draw the molecular orbital diagram of N_2, calculate its bond order and predict its magnetic behavior.	10M

OR

11. B).	Discuss the crystal field splitting in square planar complexes.	10M

12. A).	Derive Nernst equation and give it's applications.	10M

OR

12. B).	Give an account of eletroless plating of Nickel.	10M

13. A).	Write the selection rules involved in vibrational and rotational spectroscopy.	10M

OR

13. B).	Discuss the principle involved in NMR Spectroscopy and write it's applications.	10M

14. A).	Describe the estimation of hardness of water sample by EDTA Method.	10M

OR

14. B).	Discuss the causes and effects of boiler troubles.	10M

15. A).	Draw and explain the conformational isomers of n-butane.	10M

OR

15. B).	Give the synthesis of paracetamol and Ibuprufen.	10M

*****

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech II Semester Supplementary Examinations March/April-2023
Course Name: APPLIED PHYSICS
(Common for ECE, CSE, IT & CSD)

Date: 24.03.2023 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1. Write the physical significance of the wave function by mentioning the normalization condition. 2 M

2. Mark the importance of Fermi - Dirac distribution. 2 M

3. Summarize the mass action law in semiconductors. 2 M

4. Discuss the electron hole pair generation. 2 M

5. Explain the Depletion region of P-N junction diode. 2 M

6. List any four applications of solar cell. 2 M

7. What are the characteristics of laser radiation? 2 M

8. Numerical aperture of a optical fiber is 0.5 and core refractive index is 1.48 Show that cladding refractive index is 1.393 and acceptance angle is 30^0. 2 M

9. Define the terms Polarization and Polarizability. 2 M

10. Utilize the Bohr magneton, write the orbital magnetic moment equation. 2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Evident of matter wave through Davison Germer's experiment, explain in detail. 10M

OR

11. B). Derive an expression for Density of energy states. 10M

12. A). Mention any six differences between intrinsic and extrinsic semiconductor. Develop the expression for the Fermi energy level in intrinsic semiconductor. 10M

OR

12. B). What is Hall effect? Derive an expression for Hall coefficient and mention any three applications of it. 10M

13. A). Explain the formation of p-n junction diode. Discuss the I-V characteristics of p-n diode. 10M

OR

13. B). Sketch the construction and working of LED and write any four applications of it. 10M

(P.T.O..)

14. A). Explain the working of He – Ne laser with energy level diagram. 10M

OR

14. B). What are the step index fiber and graded index fiber? How light propagates through step index fiber and graded index fiber. 10M

15. A). Discuss various Polarization processes in Dielectrics and derive the equations for total Polarizability in dielectrics. 10M

OR

15. B). Explain the Hysteresis behavior in ferro magnetic materials on the basis of Domain theory. 10M

*****

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech II Semester Supplementary Examinations March/April-2023
Course Name: PROGRAMMING FOR PROBLEM SOLVING
(Common for CIVIL & MECH)

Date: 28.03.2023 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1. Write an algorithm to check whether given number is even or odd.   2 M
2. What is difference between gets and scanf? Give their syntax.   2 M
3. Define recursion. How is it different from iteration.   2 M
4. Differentiate between while and do-while.   2 M
5. Discriminate between **break** and **continue**.   2 M
6. In the following code how many time "*hello*" is printed.   2 M

    for(i=1;i<10;i++)

       for(j=1;j<i;j++)

    print("hello");

7. Differentiate between structure and union.   2 M
8. Analyze the output of following code.   2 M

    int *p;

    int a[]={ 10,20,30,40,50 };

    p=a;

    printf("%d",p[3]);

9. What are different modes of opening a file?   2 M
10. In the following statement what are argc, argv?   2 M

    void main(int argc,char *argv[])

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Explain about Flowchart? List all the symbols used in flowchart. Draw the flowchart to find greatest of three numbers.   10M

OR

11. B). What are the different categories of operators used in C language? Explain each with examples.   10M

12. A). Define Array? How to declare 2-D array? Write a program to perform addition two matrices.   10M

OR

12. B). What are different types of if statement in C? Explain with syntax and examples? Write a program to calculate grade of a student based on average marks?   10M

(P.T.O..)

13. A). i) Define function? Discriminate between call by value and call by reference with suitable examples. 7M
    ii) Write a program to calculate 'n' Fibonacci series using functions. 3M

OR

13. B). Explain any 5 string handling functions with an example. 10M

14. A). Write a program to create a structure of 'n' employees with fields eid, name, salary. Display the names of those employees whose salary is greater than 30000. 10M

OR

14. B). Define pointer? Explain about all arithmetic operations performed on pointers, explain with examples? Write a program to concatenate two strings. 10M

15. A). Define file? Write a program to merge two files. 10M

OR

15. B). Explain how bubble sort is performed on following list with each pass: 10M
    82, 12, 2, 24, 70, 18, 15, 12, 7,5

*****

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech II Semester Supplementary Examinations March/April-2023
Course Name: DATA STRUCTURES & ALGORITHMS
(Common for EEE, ECE, CSE, IT, CSC, CSM, CSD, AID & AIM)

Date: 28.03.2023 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   **10x2=20M**

1.	State the different types of linked lists.	2 M
2.	List out the disadvantages of using a linked list.	2 M
3.	List the applications of stacks.	2 M
4.	Define a queue.	2 M
5.	Define degree of the node.	2 M
6.	Define a binary tree.	2 M
7.	What is a directed graph?	2 M
8.	What do you mean by hash table?	2 M
9.	Mention the types of sorting.	2 M
10.	What do you mean by internal and external sorting?	2 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). Explain the procedure to insert an element at front, middle and at the end of a singly linked list.   10M

OR

11. B). Explain the structure of circular linked list? Write the algorithm for creation of circular linked list.   10M

12. A). What is stack? Why it is known as LIFO? Write an algorithm of PUSH, POP operation on stack.   10M

OR

12. B). Explain circular queue and its operations with examples.   10M

13. A). Construct a binary tree for the inorder traversal:7,9,4,2,5,1,3,6,8 and Preorder traversal:1,2,4,7,9,5,3,6,8   10M

OR

13. B). Explain AVL tree rotations in detail.   10M

14. A). Write an algorithm for BFS and DFS? Trace with an example.   10M

OR

14. B). Describe Collision Resolution Techniques in detail.   10M

15. A). Write an algorithm for quick sort and trace it with an example.   10M

OR

15. B). Explain Knuth-Morris-Pratt algorithm with an example.   10M

*****

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech II Semester Supplementary Examinations March/April-2023

Course Name: ENGLISH

(Common for CE, EEE, ME, CSC, CSM, AID & AIM)

Date: 01.04.2023 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.　　　　　　　　10x2=20M

1.　**Identify the errors in prepositions and correct them.**　　2 M
　　A). Prakash and Rajesh distributed work among themselves.
　　B). They were discussing about the matter with their manager.

2.　**Form nouns from the following verbs using appropriate suffixes.**　　2 M
　　A). confuse　　　　B). confirm
　　C). assess　　　　D). accept

3.　**Identify the errors in articles and correct them.**　　2 M
　　A). One needs to have a MBBS to become a doctor.
　　B). My brother has met an one-eyed man.

4.　**Correct the following sentences with appropriate punctuation marks.**　　2 M
　　A). This is Bindus bouquet.
　　B). The store provides groceries medicine and gift articles.

5.　**Correct the following sentences (noun-pronoun agreement).**　　2 M
　　A). The jury were divided in its opinions in shortlisting candidates.
　　B). Neither Bindu nor her friends will bring her basketball.

6.　**Correct the following sentences (subject-verb agreement).**　　2 M
　　A). Some of the articles kept on display is free of cost.
　　B). If machinery are not serviced on a regular basis it will not work properly.

7.　**Rewrite the sentences placing the modifiers in the right place.**　　2 M
　　A). Rakesh raised by a customer has quickly fixed the problem.
　　B). The ship crew yesterday won several awards for their bravery.

8.　**Fill in the blanks with the antonyms of the words given in brackets.**　　2 M
　　A). It would be unfair to _____ the proposal, especially when we have not had the time to go through it. (accept)
　　B). The two phones were _____ in every way except for the price (different).

9.　**Identify and delete the redundant words/phrases from these sentences.**　　2 M
　　A). B.Tech course is absolutely perfect choice for graduates.
　　B). The manager has reverted back the mail to employees.

10.　**Find out what these abbreviations/acronyms stand for.**　　2 M
　　A). LASER　B). RAM　3). ASAP　D). CNG

(P.T.O..)

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Elucidate on the central idea of William Hazlitt's essay 'On the Conduct of Life'.   10M

OR

11. B). Discuss the importance and methods of forming words along with necessary examples.   10M

12. A). Elaborate on the summary, symbolism, imagery, tone and stylistic devices in Alfred   10M
Tennyson's poem 'Brook'

OR

12. B). Explain the salient characteristics of the essay 'How I became a Public Speaker' for self-   10M
development.

13. A). Elucidate on the effective time management strategies discussed in the Seneca's letter   10M
'One Saving Time'.

OR

13. B). Discuss in detail about the various principles effective writing skills with examples.   10M

14. A). Explain the essence of Mohammed Younus' biography along with its justification.   10M

OR

14. B). Write an essay on use and abuse of mobile phone in today's society.   10M

15. A). There is a link between the (degraded) English language of his time and the degraded   10M
political situation. Explain the statement in Orwell's essay 'Politics and the English
Language'.

OR

15. B). What is summary writing and discuss its important characteristics.   10M

*****

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech II Semester Supplementary Examinations March/April-2023
Course Name: ENGINEERING DRAWING
(Common for CSE, IT, CSD & ECE)

Date: 01.04.2023 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1. Define eccentricity and how this varies with the conic sections.   1 M
2. Show a line of 90mm long into 13 equal parts.   1 M
3. Differentiate first and third angle projection.   1 M
4. A point G is lying on both H.P and V.P. Draw its projections.   1 M
5. Differentiate prism and pyramid.   1 M
6. Show the projections of a cylinder, of base 25mm diameter and axis 60 mm long, when it is resting on H.P on one of its bases.   1 M
7. Show the isometric scale of projection.   1 M
8. Show the isometric projection of a square plane of side 40 mm.   1 M
9. How can you define orthographic projection.   1 M
10. Show the 3-Orthographic views of a sphere of diameter 30mm.   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Construct a conic when the distance between its focus and its directrix is equal to 60 mm and its eccentricity is one. Name the curve.   10M

OR

11. B). Construct a hypocycloid of a circle 50 mm diameter which rolls inside of another circle of 100 mm diameter for one revolution.   10M

12. A). The top view of a line of 70 mm measures 50 mm and front view measures 60 mm. It's one end is 8 mm above the H.P. and 12 mm in front of the V.P. Develop the projections of the line showing the inclinations with H.P and V.P.   10M

OR

12. B). A square ABCD of 50mm side has its corner A in the H.P, its diagonal AC inclined at 30° to the H.P. and the diagonal BD inclined at 45° to the V.P. and parallel to the H.P. Show its projections.   10M

13. A). An equilateral triangular prism of side of base 30mm and axis 60mm long, is resting on an edge of its base on HP. The face containing that edge is inclined at 30° to HP. Build the projections of the prism, when the edge on which the prism rests, is inclined at 60° with VP.   10M

OR

13. B). A cone of base diameter 40 mm and axis 60 mm long rests with one of the points on the circumference of its base on HP. Its axis is inclined at 30° to HP and 45° to VP. Develop its projections.   10M

(P.T.O..)

14. A). Construct the isometric view of the ribbed angle plate as shown in figure. All dimensions   10M
are in mm.
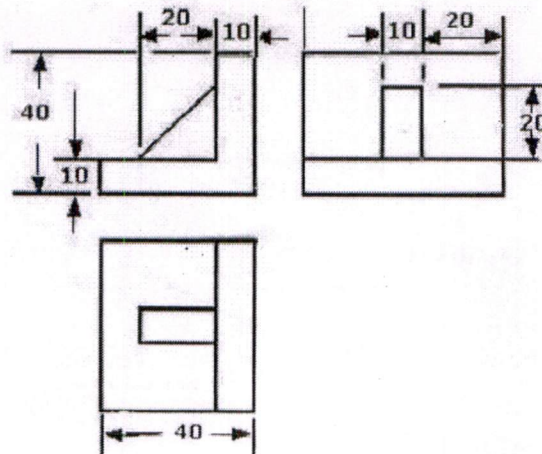
OR

14. B). A cone of 40 mm diameter and 60 mm axis resting on its base on top of the cylinder of   10M
base 60 mm and axis 70 mm. The cylinder is resting on the ground on its base. Construct
the isometric view of the compound solid.

15. A). Develop the front view, top view and side view for the following part shown in figure. All   10M
dimensions are in mm.
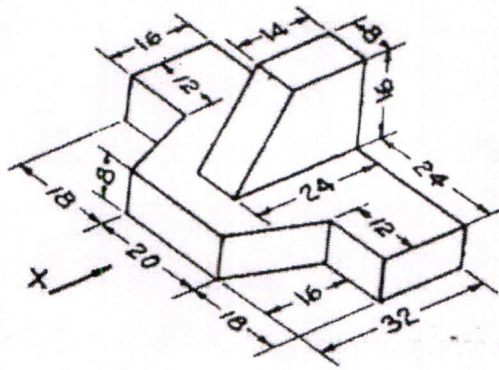
OR

15. B). Show the front view, top view and left side view of the object shown in figure.   10M
(All dimensions are in mm).
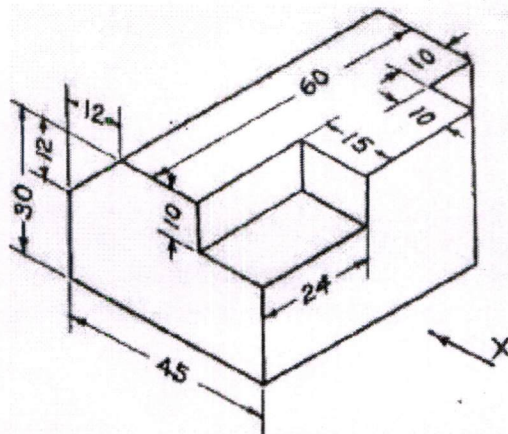
*****

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech II Semester Supplementary Examinations March/April-2023
Course Name: PYTHON PROGRAMMING
(Common for all Branches)

Date: 04.04.2023 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	What happens if a semicolon (;) is placed at the end of a Python statement?	2 M
2.	Write a for loop that prints numbers from 0 to 57, using range function.	2 M
3.	Can a Python function return multiple values? If yes, how it works?	2 M
4.	How to handle multiple exceptions with single except clause?	2 M
5.	What is string?	2 M
6.	What are Directories and sets in python?	2 M
7.	Write a program to read and print student data using class.	2 M
8.	List the techniques for designing classes.	2 M
9.	What are canvas and frame? why are they used.	2 M
10.	What is image processing?	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	Explain Conditional and repetitive control structures, each with example.	10M
	OR	
11. B).	Discuss about functions and Modules.	10M
12. A).	How exceptions are handled. Justify with a program?	10M
	OR	
12. B).	What is a file, and its modes of operations give an example of using loops to process files?	10M
13. A).	What is data encryption? Explain about lists, list slicing and other list methods.	10M
	OR	
13. B).	What is recursion why and when do we use this justify with a program?	10M
14. A).	Discuss the features of object-oriented programming.	10M
	OR	
14. B).	Discuss about overriding.	10M
15. A).	Design a page showing radio buttons and check buttons.	10M
	OR	
15. B).	In Turtle graphics discuss about shapes and colors using a program.	10M

*****