

H.T No:

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R22

Course Code: A400001

**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**
(UGC AUTONOMOUS)

B.Tech I Semester Regular & Supplementary Examinations February-2024

Course Name: MATRICES AND CALCULUS

(Common for all Branches)

Date: 06.02.2024 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 the matrix. 1 M
2. State the conditions of Homogeneous linear system of equations. 1 M
3. Find the Trace of the matrix whose Eigen values are -2, 2, 3 1 M
4. Find the Eigen values of the matrix $A = \begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ 1 M
5. State Cauchy's mean value theorem. 1 M
6. Find the value of $\int_0^1 x^3(1-x)^4 dx$. 1 M
7. Define Functional Dependence and Independence. 1 M
8. Find $J\left(\frac{u,v}{x,y}\right)$ where $u = x^2$ and $v = y^2$ 1 M
9. Find the area enclosed between the parabola $y = x^2$ and the line $y = x$ 1 M
10. Evaluate $\int_0^1 \int_1^2 \int_2^3 xyz \, dx dy dz$ 1 M

PART-BAnswer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Determine the values of λ for which the following set of equations may possess non-trivial solution $3x + y - \lambda z = 0, 4x - 2y - 3z = 0, 2\lambda x + 4y + \lambda z = 0$, find the solutions for each λ . 10M

OR

11. B). Discuss for what values of λ, μ the simultaneous equations $x + y + z = 6, x+2y+3z = 10, x+2y+\lambda z = \mu$. have (i) No solution (ii) Unique solution (iii) Infinite no of solutions. 10M

12. A). i) State Cayley-Hamilton theorem. 2M

ii) Verify Cayley Hamilton Theorem for $A = \begin{bmatrix} 7 & 2 & -2 \\ -6 & -1 & 2 \\ 6 & 2 & -1 \end{bmatrix}$ and hence find A^4 8M

OR

12. B). Diagonalize the matrix $A = \begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$ 10M

(P.T.O.)

13. A). If $a < b$ then prove that $\frac{b-a}{1+b^2} < \tan^{-1}b - \tan^{-1}a < \frac{b-a}{1+a^2}$ using Lagrange's Mean value theorem and deduce $\frac{\pi}{4} + \frac{3}{25} < \tan^{-1}\frac{4}{3} < \frac{\pi}{4} + \frac{1}{6}$. 10M

OR

13. B). Prove that $B(m, n) = 2 \int_0^{\frac{\pi}{2}} \sin^{2m-1}\theta \cos^{2n-1}\theta d\theta$ and hence evaluate $\int_0^{\frac{\pi}{2}} [\sqrt{\cot\theta}] d\theta$. 10M

14. A). If $U = \log(x^3 + y^3 + z^3 - 3xyz)$ then prove that $\left(\frac{\partial}{\partial x} + \frac{\partial}{\partial y} + \frac{\partial}{\partial z}\right)^2 U = \frac{-9}{(x+y+z)^2}$ 10M

OR

14. B). Find the minimum value of $x^2 + y^2 + z^2$, given that $x + y + z = 3a$ using Lagrange's method of multipliers. 10M

15. A). Show that the area between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$ is $\frac{16}{3}a^2$ 10M

OR

15. B). Change of order of integration and evaluate $\int_0^{4a} \int_{\frac{x^2}{4a}}^{2\sqrt{ax}} dy dx$ 10M

H.T No:

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R22

Course Code: A400008



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech I Semester Regular & Supplementary Examinations February-2024

Course Name: APPLIED PHYSICS

(Common for CE, ME, CSC, CSM, CSD & AIM)

Date: 08.02.2024 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 the Heisenberg Uncertainty Principle. 1 M
2. Explain the difference between conductors, semiconductors and Insulators. 1 M
3. Discuss the importance of doping for semiconductors. 1 M
4. Mention any two differences between the Direct and Indirect bandgap semiconductors. 1 M
5. Explain the importance of population inversion for laser output. 1 M
6. Explain the principle involved in the optical fiber. 1 M
7. Define i. Electric Polarization ii. Dielectric constant. 1 M
8. List any two differences between Hard and Soft magnetic materials. 1 M
9. Write any four applications of energy materials. 1 M
10. What is nanoscale? 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). i) Derive an expression for the energy of a particle inside a potential box using Schrödinger's time-independent wave equation. 8M
ii) Draw the probability distribution for a particle in a box at the n=3 energy level. 2M
- OR**
11. B). i) Explain the drawbacks of classical free electron theory. 2M
ii) Using Kronig-Penney model show that the energy spectrum of an electron contains a no of allowed energy bands separated by forbidden gaps. 8M
12. A). Explain the concept of the Hall effect and discuss its importance in measuring the nature of semiconductor and carrier concentration. 10M
- OR**
12. B). Explain the construction and working of solar cells with a neat diagram. 10M
13. A). i) Explain about the spontaneous and stimulated emissions. 3M
ii) Describe the construction of the He-Ne laser and discuss its working with the relevant ELD diagram. 7M
- OR**
13. B). i) Derive the expressions for acceptance angle and numerical aperture. 7M
ii) Write a note on the applications of optical fibers. 3M

(P.T.O..)

14. A). Explain various polarization mechanisms in dielectrics. 10M

OR

14. B). Draw and explain the B-H curve for a ferromagnetic material based on domain theory. 10M

15. A). Explain the importance of supercapacitors. Discuss the role of different materials and electrolytes for supercapacitors. 10M

OR

15. B). i) Write a short note on the importance of bottom-up synthesis methods to prepare nanostructures. 3M

ii) Explain the principle, construction and working of TEM. 7M

H.T No:

R22

Course Code: A40009



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech I Semester Regular & Supplementary Examinations February-2024

Course Name: ENGINEERING CHEMISTRY

(Common for EEE, ECE, CSE & IT)

Date: 08.02.2024 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. What are primary batteries? Give examples? 1 M
2. Give the bath composition for the electroplating of copper. 1 M
3. Define Biodegradable polymers. Give an example. 1 M
4. Write the preparation method for PVC. 1 M
5. Define Higher Calorific Value and Lower Calorific Value? 1 M
6. What is fuel? Classify fuels with one example for each. 1 M
7. Define hardness of water. 1 M
8. Calculate the hardness of water having 5mg MgCl₂ per liter. 1 M
9. Define pour point and cloud point. 1 M
10. What are smart materials? 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). What are fuel cells? Explain the construction and working of hydrogen-oxygen fuel cell. 10M
- OR**
11. B). i) What are the different methods for prevention of corrosion? 5M
ii) Explain the process of electroplating by taking copper as an example. 5M
12. A). i) Differentiate thermosetting and thermoplastics resins. 5M
ii) Write the preparation, properties and applications of Teflon. 5M
- OR**
12. B). What is natural rubber? How it can be obtained from latex? Write a short note on vulcanization? 10M
13. A). i) Write short notes on the classification of coal. 5M
ii) Define octane number and explain how anti knocking properties are improved? 5M
- OR**
13. B). i) Write short notes on ultimate analysis of coal. 5M
ii) What is cetane number and explain how anti knocking properties are improved? 5M

(P.T.O..)

14. A). i) What are the disadvantages of hard water? Explain how hardness can be estimated by EDTA method? 5M
ii) Explain the Ion Exchange process with a neat labelled diagram. 5M

OR

14. B). Elaborate on Calgon conditioning & Permutit process. 10M

15. A). i) Write a note on the properties of glass? 3M
ii) Discuss the chemical composition and various reactions involved in setting and hardening of Portland Cement. 7M

OR

15. B). i) Define lubricant. Write the classification of lubricants. 5M
ii) Explain viscosity and viscosity index. 5M

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R22

Course Code: A400101



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech I Semester Regular & Supplementary Examinations February-2024

Course Name: ENGLISH FOR SKILL ENHANCEMENT

(Common for CE, ME, CSC, CSM, CSD & AIM)

Date: 10.02.2024 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. **Identify the correct sentence.** 1 M
 - a) Kalpana is dancer.
 - b) We long for the peace.
 - c) The spiders in the film were scary.
2. **Frame one word with each suffix.** 1 M
 - a) -phobia
 - b) --ure
3. **Fill in the blank with the right word.** 1 M

_____ is reading quickly to get an overall idea of the text.
4. **Fill in the blanks with suitable pronouns.** 1 M

You and I managed to complete _____ work in time, but neither Rohit nor Ajay submitted _____ work.
5. **Rewrite the sentence, moving the misplaced modifier to its correct position.** 1 M

The piece was missing from the puzzle that we needed to complete the set.
6. **Frame a sentence on your own by using the given word.** 1 M
 - a) diffuse
 - b) defuse
7. **Rewrite the sentence to avoid cliché.** 1 M

Leading the team is no bed of roses.
8. **What is the full form of IPO _____** 1 M
9. **Give the plural form of the following words.** 1 M
 - a) fungus
 - b) valley
10. **Correct the error and rewrite.** 1 M
 - a) 100-metres run
 - b) 60-years-old man

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). R K Narayan is of the opinion that we need a 'Bharat' brand of English? Do you agree with the author's opinion? 10M
- OR**
11. B). Explain in detail about any five methods of word formation with examples. 10M
 12. A). Interpret the reasons for Sudha Murthy's great respect for JRD Tata. 10M
- OR**
12. B). Why some words are categorized into Homophones, Homonyms, and Homographs? Show the difference with proper examples. 10M

(P.T.O.)

13. A). Design your own plan of online classes based on the four takeaways related to online learning that should be retained post-pandemic. 10M

OR

13. B). Write a cover letter in response to the advertisement for the position of Trainee Software Engineer in Gamma & Alpha company located in Mumbai. 10M

14. A). Analyze how the Indian civilization managed to survive in the different forces of change. 10M

OR

14. B). Summarize the central theme and supporting details presented in the given passage? 10M

Discipline is of the utmost importance in student life. If the young students do not obey their superiors and go without discipline, they will be deprived of much of the training they should have at this period and in future they will never be able to extract obedience from others in the society. Society will never accept them as persons fit for commanding and taking up any responsible positions in life. So it is the bounder. Duty of all the students is to observe discipline in the preparatory stage of their life. A college without discipline can never impart suitable education to students. The rule of discipline in the playground and the battle field as well plays a very important role. A team without discipline may not fare well in spite of good players for want of mutual understanding and cooperation. In any army everyone from the rank of the general down to the ranks of an ordinary soldier must observe discipline. In case a soldier does not obey his immediate superior the army becomes a rabble quite unfit for the achievement of the common ends of war. At first sight it may appear to us that discipline takes away individual liberty. But on analysis it is found that it does not do so, for liberty is not license. We find disciplined liberty at the root of all kinds of human happiness.(232 words)

15. A). Choose a suitable format and prepare a report on the given situation. 10M
Present the annual report of your College Students Association. The report could mention its purpose, the members of its organizing committee, its activities, and plans for the coming years.

OR

15. B). Summarize the types of Technical reports with suitable examples. 10M

H.T No:

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R22

Course Code: A402202



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech I Semester Regular & Supplementary Examinations February-2024

Course Name: **ELECTRICAL CIRCUIT ANALYSIS-I**

(Electrical & Electronics Engineering)

Date: 10.02.2024 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 Active and Passive Elements and write examples. 1 M
2. Define Inductance and write the equation of energy stored in Inductor. 1 M
3. What is the significance of quality factor in series resonant circuit? 1 M
4. Draw the locus diagram of RC series circuit assume that C is fixed R is variable. 1 M
5. State maximum power transfer theorem. 1 M
6. State Compensation theorem. 1 M
7. Give some methods available for measuring three-phase power. 1 M
8. What are the advantages of 3 phase circuits over single phase circuits? 1 M
9. What is Faraday's law of electromagnetic induction? 1 M
10. Define Tree. 1 M

PART-B

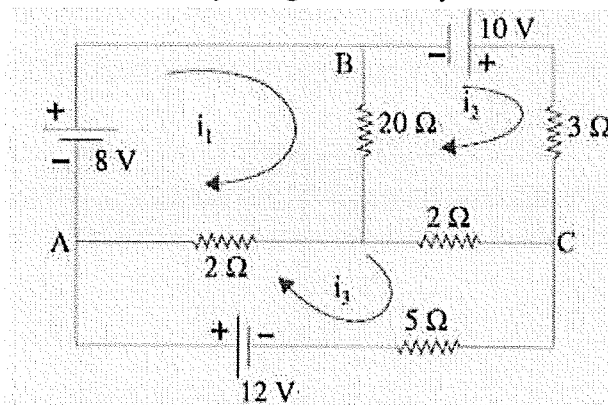
Answer the following. Each question carries TEN Marks.

5x10=50M

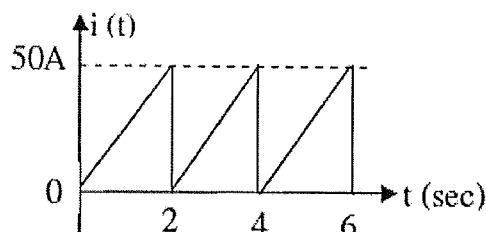
- 11.A). Explain the independent and dependent sources with neat diagrams and characteristics. 10M

OR

11. B). Determine current in 5ohm resistor by using Mesh Analysis method. 10M



12. A). Calculate RMS value, average value, form factor for the saw waveform shown in Figure. 10M

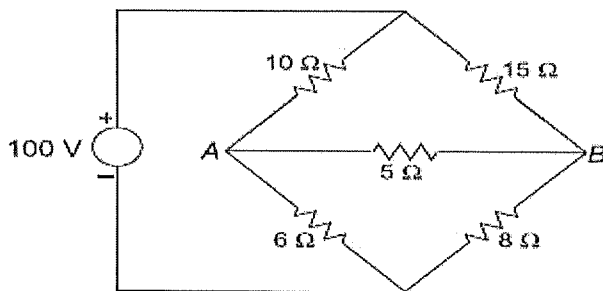


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OR

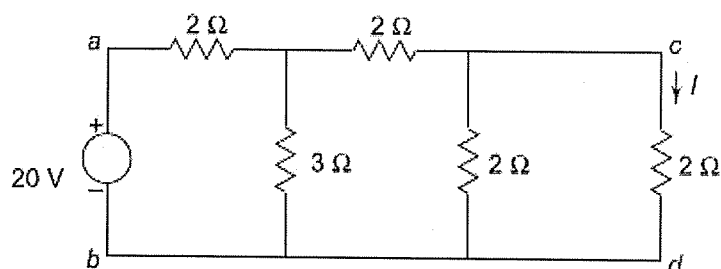
12. B). An RLC Series circuit consists of $R=1k\Omega$, $L=100mH$, $C=10\mu F$. If a voltage of $100V$ is applied across the combination, determine resonant frequency, quality factor and bandwidth. 10M

13. A). Use Thevenin's theorem to find the current in 5Ω resistor as shown in fig. 10M



OR

13. B). Verify the reciprocity theorem for the network shown in Fig. 10M



14. A). Explain about Star connected three phase balanced circuits and also derive the relation between line and phase voltages with neat necessary diagrams. 10M

OR

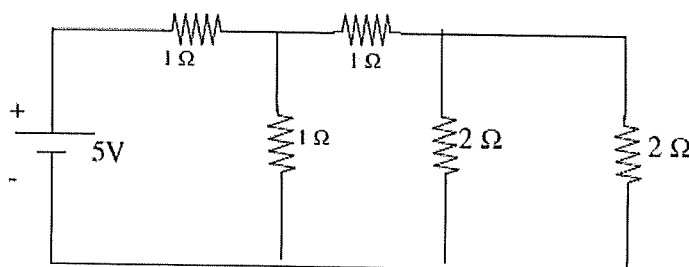
14. B). Explain how to measure three phase power by using Two Wattmeter method with neat diagrams. 10M

15. A). i) Define the following terms: (a) Reluctance (b) mmf (c) Magnetic flux density (d) Magnetic field strength. 4M

ii) Derive the expression for coefficient of coupling when the two coils are mutually coupled. 6M

OR

15. B). Draw the graph of the network shown in figure and select a suitable tree to write Tie-set schedule. Also find the loop currents. 10M



H.T No:

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R22

Course Code: A402201



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech I Semester Regular & Supplementary Examinations February-2024

Course Name: BASIC ELECTRICAL ENGINEERING

(Common for ECE, CSE & IT)

Date: 10.02.2024 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. State Ohm's law. | 1 M |
| 2. State Norton's Theorem. | 1 M |
| 3. Define Time Period. | 1 M |
| 4. Define power factor. | 1 M |
| 5. Write different types of losses in transformers. | 1 M |
| 6. Draw the equivalent circuit of a transformer under no load condition. | 1 M |
| 7. Write the EMF equation of a DC Generator. | 1 M |
| 8. Define synchronous speed. | 1 M |
| 9. What are the different types of wires and cables? | 1 M |
| 10. What is earthing and write down its significance. | 1 M |

PART-B

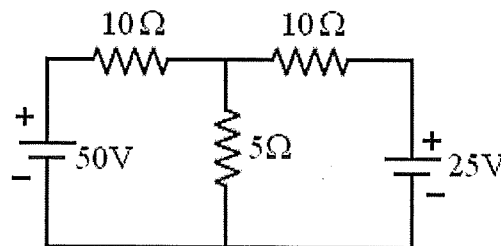
Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). i) Explain in detail about the volt-ampere relationship of R, L and C elements with neat diagrams. 5M
- ii) Explain in detail about the different types of sources. 5M

OR

11. B). In the circuit given below figure, find the current through 5Ω resistor using Superposition Theorem. 10M



12. A). i) Derive the Average and RMS value of the sine signal. 6M
- ii) A coil takes a current of 1A at 0.6 lagging power factor from a 220V, 60 Hz single phase source. If the coil is modeled by a series RL circuit, find 4M
- a) The complex power in the coil.
- b) The values of R and L

(P.T.O.)

OR

12. B). i) A 240V, 50 Hz AC supply is applied to a coil of 0.08 H inductance and 4Ω resistance connected in series with a capacitor of $8 \mu\text{F}$. Calculate the (a) Impedance (b) Circuit current. (c) Phase angle between voltage and current (d) Power factor. 4M
ii) Explain and write down the expressions for a) Active Power b) Reactive Power c) Apparent Power from the power triangle. 6M

13. A). i) Explain the principle of operation of single phase transformer with necessary diagrams. 7M
ii) A single phase transformer has 540 primary turns and 60 secondary turns. The primary is connected to a 4400V AC supply. Calculate the maximum flux in the core. 3M

OR

13. B). Explain Y/ Δ and Δ /Y connections used in 3-phase connection of transformers. Also, state their advantages and disadvantages? 10M

14. A). Explain the principle of operation and construction of a DC generator with neat diagrams. 10M

OR

14. B). Explain the principle of operation and construction of a three phase induction motor with necessary diagrams. 10M

15. A). Explain the functions of MCB and SFU with neat sketches. 10M

OR

15. B). i) Explain in detail about the different types of earthing with necessary diagrams. 5M
ii) What are the drawbacks of low power factor, describe how it is improved? 5M

H.T No:

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R22

Course Code: A403201



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech I Semester Regular & Supplementary Examinations February-2024

Course Name: ENGINEERING MECHANICS

(Common for CE & ME)

Date: 13.02.2024 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

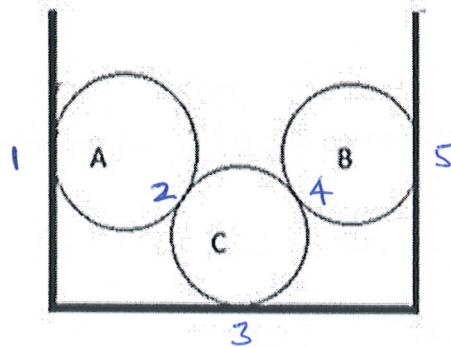
- | | |
|--|-----|
| 1. How a moment of a force about an axis is calculated. | 1 M |
| 2. What is resultant force? | 1 M |
| 3. Explain about limiting friction. | 1 M |
| 4. Explain about the function of Screw Jack. | 1 M |
| 5. Explain the difference between centroid and center of gravity. | 1 M |
| 6. State first theorem of Pappus. | 1 M |
| 7. Explain about perpendicular axis theorem. | 1 M |
| 8. What is moment of inertia of a rectangle about its centroidal axis? | 1 M |
| 9. What is the work energy equation? | 1 M |
| 10. What is Newton second law? | 1 M |

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Three smooth cylinders, each of diameter d and weight W are placed in a rectangular channel of width 5 times radius of cylinders as shown in Figure. Determine the reactions at all contact surfaces. 10M

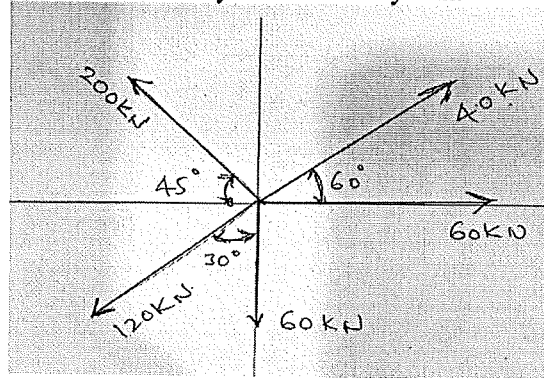


(P.T.O..)

OR

11. B). Find the Resultant force of the concurrent system of force system.

10M



12. A). A uniform ladder of length 10m and weighing 20N is placed against a smooth vertical wall with its lower end 8m from the wall. In this position the ladder is just to slip. Determine the coefficient of friction between the ladder and the floor. Frictional force acting on the ladder at the point of contact between the ladder and the floor.

10M

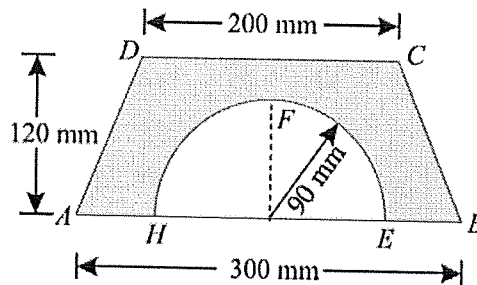
OR

12. B). A screw jack raises a load of 40 kN. The screw is square threaded having three threads per 20 mm length and 40 mm in diameter. Calculate the force required at the end of a lever 400 mm long measured from the axis of the screw, if the coefficient of friction between screw and nut is 0.12

10M

13. A). A semicircle of 90 mm radius is cut out from a trapezium as shown in Fig. Find the position of the Centroid of the plane lamina with respect to the axes passing through base

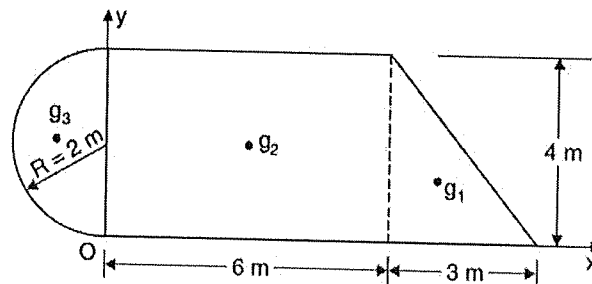
10M



OR

13. B). Determine the centroid of the area shown in Fig. with respect to the axis shown.

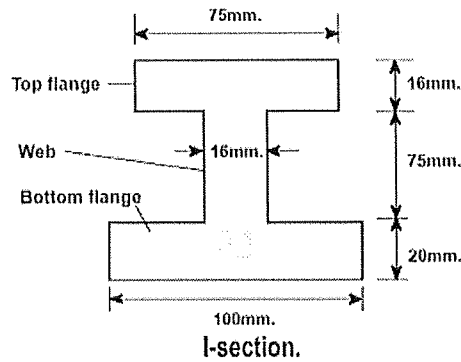
10M



(P.T.O..)

14. A). Find the Moment of inertia of the given lamina about its centroidal axis and the Top

10M



OR

14. B). Find the mass moment of inertia of the solid cone of mass m , height h and base radius R about its axis of rotation.

10M

15. A). A man of mass 50 kg stands at the one end of a 5 m long floating boat of mass 250 kg. If the man walks towards the other end of the boat at a steady rate of 1.0 m/s, Determine (i) the velocity of the boat as observed from the ground (ii) the distance by which the boat gets shifted.

10M

OR

15. B). A block of weight 2500N rests on a level horizontal plane for which coefficient of friction is 0.2. This block is pulled by a force of 1000N acting at an angle 30° to the horizontal. Find the velocity of the block after it moves 30m starting from rest. If the force of 1000N is then removed, how much further will it move? Use work energy method.

10M

H.T No:

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R22

Course Code: A405202



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech I Semester Regular & Supplementary Examinations February-2024

Course Name: C PROGRAMMING AND DATA STRUCTURES
(Common for EEE & ECE)

Date: 13.02.2024 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 the variable. 1 M
2. List out the C-Tokens. 1 M
3. Write the syntax for the if else statement? 1 M
4. What is an Array? Give an example of Array. 1 M
5. What is the need of functions in programming? 1 M
6. List any four String handling functions. 1 M
7. What is the Abstract data type? 1 M
8. Define Queue. 1 M
9. Compare Linear Search and Binary Search. 1 M
10. What is the time complexity? 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). What is an operator? List and explain any five types of operators with suitable program(s). 10M
- OR**
11. B). List and Analyze about the four storage classes with suitable example programs. 10M
12. A). i) Distinguish between the while and do-while loops? 4M
ii) Implement a program to find whether the given number is prime or not. 6M
- OR**
12. B). Write a program to find the Multiplication of two matrices. 10M
13. A). i) What is the string? 2M
ii) Write a program to reverse the string using your own implementation. 8M
- OR**
13. B). i) Define the pointer. 2M
ii) Write a program to show the differences between call by value and call by reference. 8M
14. A). i) What is the Stack? 2M
ii) Write a program to implement stack using Linked List. 8M

(P.T.O..)

OR

14. B). i) Define the Singly Linked List with neat sketch. 3M
ii) Write a program to implement the operations of Queue ADT with an array representation. 7M

15. A). i) Explain the Bubble Sort algorithm with an example. 4M
ii) Write the program to implement Bubble Sort. 6M

OR

15. B). i) Write about Binary Search with example? 5M
ii) Write a program to implement the Binary Search algorithm. 5M

H.T No:

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R22

Course Code: A405201



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech I Semester Regular & Supplementary Examinations February-2024

Course Name: PROGRAMMING FOR PROBLEM SOLVING

(Common for CSE, IT, CSC, CSM, CSD & AIM)

Date: 13.02.2024 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 algorithm. State the characteristics of algorithm. 1 M
2. What is the use of conditional operator? 1 M
3. Write the syntax and example of switch statement 1 M
4. Define array. Declare a variable consisting of 4 rows and 6 columns. 1 M
5. Define recursion. 1 M
6. Write about strings as array of characters. 1 M
7. What are the differences between array and structure? 1 M
8. Write about preprocessor directives. 1 M
9. How can we open a file with append mode? 1 M
10. What is the time complexity of binary search? 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Describe in detail about the various data types supported by C with suitable examples each. 10M
- OR**
11. B). Explain in detail about the various operators with examples each. 10M
12. A). Write a program that demonstrates student grade system by accepting student details such as name, class, age, address, 6 subject marks and display the grade such as A+, A, B+, B, C, D, E. (Hint: A+: 90-100; A: 80-90; B+: 70-80; B: 60-70; C: 50-60; D: 40-50; E: <40) 10M
- OR**
12. B). Explain in detail about the various storage classes in C with examples. 10M
13. A). i) Write a program to find the factorial of a given number using while loop. 5M
ii) Write a program to find the sum of n natural numbers using recursion. 5M
- OR**
13. B). What is strings? List out the string handling functions in C with suitable example. 10M
strlen(), strcpy(), strcat(), strcmp().

(P.T.O..)

14. A). i) Write a program to accept 'n' employee details using array of structure. 5M
ii) What is self referential structure? Write a program that demonstrates the application of self referential structure. 5M

OR

14. B). Explain in detail about the various functions used for dynamic memory allocation in C with suitable examples. 10M

15. A). i) Write a program to copy contents of one file into another file. 5M
ii) Write a program that demonstrates the usage of command line arguments. 5M

OR

15. B). i) Write a program to search for an element using binary search technique. 5M
ii) Write the algorithm for selection sort technique. 5M
