

H.T No:

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R22

Course Code: A400002



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech II Semester Regular Examinations September-2023

Course Name: ORDINARY DIFFERENTIAL EQUATIONS & VECTOR CALCULUS
(Common for all Branches)

Date: 04.09.2023 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 linear differential equation of first order. 1 M
2. Define integrating factor of a differential equation. 1 M
3. Solve $(D^3 + 1)y = 0$. 1 M
4. Find P. I of $(D^2 + 1)y = \sinh x$. 1 M
5. Define unit step function. 1 M
6. Find the Laplace transform of $\{e^{-t} \sin 2t\}$. 1 M
7. Define Solenoidal vector. 1 M
8. Find $\text{grad}(r)$, $r = |\vec{r}|$, $\vec{r} = x\vec{i} + y\vec{j} + z\vec{k}$. 1 M
9. State Gauss Stokes theorem. 1 M
10. If $\vec{F} = 3xy\vec{i} - y^2\vec{j}$ evaluate $\int_C \vec{F} \cdot d\vec{r}$ where C is the curve $y = 2x^2$ in the xy plane from $(0,0)$ to $(1,2)$. 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). i) Solve $(1 + y^2) + (x - e^{\tan^{-1}y}) \frac{dy}{dx} = 0$ 5M
- ii) The rate at which bacteria multiply is proportional to instantaneous N numbers present. 5M
If the original number doubles in 2 hours, when it will be tripled?
- OR**
11. B). i) Solve $\frac{dy}{dx} = e^{x-y}(e^x - e^y)$ 5M
- ii) Find orthogonal trajectories of $\frac{x^2}{a^2} + \frac{y^2}{b^2 + \lambda} = 1$, where λ is the parameter. 5M
12. A). Solve $(D^3 - 7D^2 + 14D - 8)y = e^x \cos 2x$ 10M
- OR**
12. B). Solve $(D^2 + 1)y = \text{cosec} x \cot x$ 10M
13. A). Find the Laplace transform of $\frac{1 - \cos t}{t}$ 10M
- OR**
13. B). Using Convolution theorem, find $L^{-1} \left\{ \frac{s^2}{(s^2 + a^2)^2} \right\}$ 10M

(P.T.O..)

14. A). i) Find the directional derivative of $x^2yz + 4xz^2$ at the point $(1, -2, -1)$ in the direction of the normal to the surface $f(x, y, z) = x \log z - y^2$ at $(-1, 2, -1)$ 5M

ii) Prove that $\text{div}(\bar{a} \times \bar{b}) = \bar{b} \cdot \text{curl} \bar{a} - \bar{a} \cdot \text{curl} \bar{b}$ 5M

OR

14. B). Show that $\nabla^2[f(r)] = f(r) + \frac{2}{r} f'(r)$ where $r = |\bar{r}|$. 10M

15. A). Verify Stokes theorem for $\bar{F} = (x^2 + y^2)\bar{i} - 2xy\bar{j}$ taken round the rectangle bounded by the lines $x = \pm a, y = 0, y = b$. 10M

OR

15. B). Evaluate by Green's Theorem $\oint (y - \sin x) dx + \cos x dy$ where C is the region bounded by $y = 0, x = \frac{\pi}{2}, \pi y = 2x$. 10M

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R22

Course Code: A400009



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech II Semester Regular Examinations September-2023

Course Name: ENGINEERING CHEMISTRY

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

Date: 06.09.2023 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 standard electrode potential. | 1 M |
| 2. What is a solar cell? Give any one of its applications. | 1 M |
| 3. Write the structure of Bakelite. | 1 M |
| 4. Name the monomer found in natural rubber. | 1 M |
| 5. What is meant by octane number of a gasoline? | 1 M |
| 6. Mention the composition of CNG. | 1 M |
| 7. Give the ions causing hardness in water. | 1 M |
| 8. Mention any four specifications of potable water. | 1 M |
| 9. List out any four general properties of glass. | 1 M |
| 10. What is meant by flash point of a lubricant? | 1 M |

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- | | |
|--|----|
| 11.A). i) Derive Nernst equation. Mention its applications. | 5M |
| ii) Calculate the EMF of the cell : Ni/Ni ²⁺ (1M)//Pb ²⁺ (1M)/Pb at 25 C. Write down its cell reactions. Standard electrode potential of nickle and lead are -0.24 V and -0.13 V respectively at 25 C. | 5M |

OR

- | | |
|---|----|
| 11. B). i) Explain in detail with a neat labeled diagram the mechanism of electrochemical corrosion by absorption of oxygen method. | 5M |
| ii) What is a fuel cell? Develop a Hydrogen-Oxygen fuel cell. Mention its applications. | 5M |
| 12. A). i) Give the preparation, properties and applications of Teflon. | 5M |
| ii) What are conducting polymers? Classify them with examples. | 5M |

OR

- | | |
|---|-----|
| 12. B). Define biodegradable polymers Give the preparation of polyvinyl alcohol. What are its applications. | 10M |
| 13. A). Explain proximate analysis of coal and give its significance. | 10M |

(P.T.O..)

OR

13. B). i) Classify fuels with examples. 5M
ii) Explain catalytical cracking by moving bed catalytic method. 5M

14. A). i) What are boiler troubles. Explain the formation, disadvantages and prevention of scales and sludges. 5M
ii) Calculate the total hardness of 1000 litre of a sample of water containing the following impurities: 16.2mg/L of $\text{Ca}(\text{HCO}_3)_2$, 11.1mg/L of CaCl_2 , 60mg/L of MgSO_4 & 19mg/L of MgCl_2 . 5M

OR

14. B). With a neat labelled diagram, describe the process of softening of water by ion exchange method. 10M

15. A). i) What is meant by a lubricant. Explain the mechanism of extreme pressure lubrication method. 5M
ii) Write short notes on strength of glass and glass articles. 5M

OR

15. B). What is portland cement. Mention its composition and comment on its setting and hardening process. 10M

H.T No:

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R22

Course Code: A400008



CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech II Semester Regular Examinations September-2023

Course Name: APPLIED PHYSICS

(Common for EEE, ECE, CSE & IT)

Date: 06.09.2023 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 Stefan Boltzmann's law. | 1 M |
| 2. | Compare between conductors, semiconductors and insulators on the basis of energy band gap. | 1 M |
| 3. | What is Zener diode? | 1 M |
| 4. | What are direct band gap semiconductors? | 1 M |
| 5. | What is population inversion? | 1 M |
| 6. | How is Acceptance angle related to Numerical aperture? | 1 M |
| 7. | Relate E, D, and P. | 1 M |
| 8. | Classify the magnetic materials based on hysteresis curve. | 1 M |
| 9. | List any two applications of superionic conductors. | 1 M |
| 10. | Define Nanomaterial. | 1 M |

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- | | | |
|--------|---|----|
| 11.A). | i) Explain the concept of de Broglie's dual nature of matter waves. | 3M |
| | ii) Summarize the experimental verification of matter waves using Davisson-Germer experiment. | 7M |

OR

- | | | |
|---------|--|-----|
| 11. B). | Summarize the concepts of allowed energy bands and forbidden energy bands based on Kronig Penny model. | 10M |
| 12. A). | i) What is Hall effect? Obtain an expression for Hall coefficient. | 6M |
| | ii) Find the density and mobility of charge carriers for a semiconductor with Hall coefficient $-6.85 \times 10^{-5} \text{ m}^3/\text{coulomb}$ and electrical conductivity is $250 \text{ m}^{-1} \Omega^{-1}$. | 4M |

OR

- | | | |
|---------|--|-----|
| 12. B). | What is a Solar cell? Explain its construction and working. Give four applications. | 10M |
| 13. A). | What are Einstein's coefficients? Find the relation between Einstein's coefficients. | 10M |

OR

- | | | |
|---------|--|----|
| 13. B). | i) List the differences between step index and graded index optical fiber | 7M |
| | ii) Find Numerical aperture and Acceptance angle for an Optical fiber with core and cladding refractive indices of 1.55 and 1.50 respectively. | 3M |

(P.T.O..)

14. A). i) Write q short notes on Ferroelectricity and Piezoelectricity 4M
ii) Deduce Clausius mossotti equation in dielectrics. 6M

OR

14. B). i) Compare between soft and hard magnetic materials. 4M
ii) Explain about bubble memory devices and give its applications. 6M

15. A). Explain the importance of rechargeable ion batteries and solid fuel cells. 10M

OR

15. B). i) Summarize sol-gel method used for the synthesis of nano particles. 6M
ii) Explain any one principal factor which cause the properties of nanomaterials to differ significantly from other materials. 4M

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R22

Course Code: A403202



CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech II Semester Regular Examinations September-2023

Course Name: ENGINEERING GRAPHICS

(Common for CE & ME)

Date: 08.09.2023 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. What is Representative Fraction (RF) in scales? 1 M
2. List out some applications of following curves, 1 M
(a) Hyperbola
(b) Hypocycloid
3. Draw the symbol of first angle of projection. 1 M
4. Point B is 20 mm below HP and 35 mm behind VP. Draw its front view and top view. 1 M
5. Define prism. 1 M
6. Define Orthographic projection. 1 M
7. Define pyramid. 1 M
8. Define development of surfaces. 1 M
9. Define Isometric projection. 1 M
10. Differentiate between Isometric projection and Isometric view. 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Construct an ellipse when the distance between the focus and the directrix is 50 mm and the eccentricity is $\frac{2}{3}$. 10M

OR

- 11.B). Draw an epicycloid, the directing circle of which is 160 mm in diameter and the generating circle is 40 mm in diameter. 10M

- 12.A). A line CD measuring 80 mm is inclined at an angle of 30° to HP and 45° to VP. The point C is 20 mm above HP and 30 mm in front of VP. Draw the projections of the straight line. 10M

OR

- 12.B). A regular pentagonal plate of 28 mm is placed with one side on HP such that the surface is inclined 40° to HP and inclined at 30° to VP. Draw its projections. 10M

- 13.A). A square prism, side of base 30 mm and axis 50 mm long, has its axis inclined at 60° to HP. It has an edge of its base in the HP and inclined at 45° to VP. Draw its projection. 10M

OR

- 13.B). Draw the projections of a square pyramid of 32 mm side of base and axis 55 mm. It is resting on HP on one of its base corners with a base side containing the corner making 30° with HP. The axis is inclined at 30° to VP and is parallel to HP. The vertex is away from the VP. 10M

(P.T.O.)

14. A). A cylinder of 50 mm diameter and axis 80 mm long lies with one of its generators on HP such that its axis is inclined at 45° to VP. A section plane parallel to VP bisects axis of the cylinder. Draw the top and sectional front views. 10M

OR

14. B). A cone of base 50 mm diameter and height 70 mm with its base on HP. A section plane perpendicular to VP and inclined at 30° to HP bisects the axis of the cone. Draw the development of the lateral surface of the truncated cone. 10M

15. A). A right hexagonal prism of side of base 24 mm and axis 56 mm long is lying on one of the edge of the base in the HP. Draw the isometric projection of the solid. 10M

OR

15. B). Convert the pictorial view of an object shown in figure-1, to multiple views (Front, top and Side view) and mark the dimensions. 10M

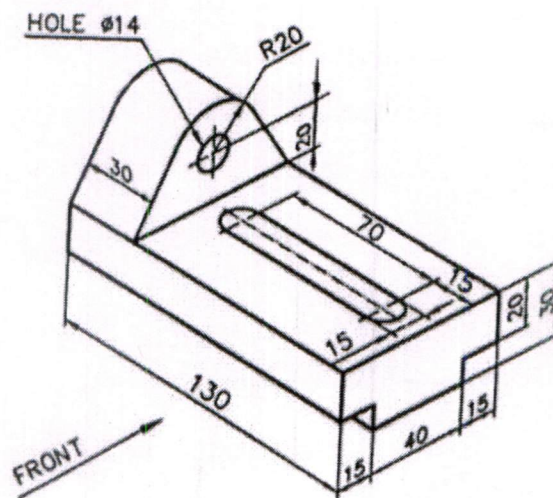


Figure -1 (All the dimensions are in mm)

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R22

Course Code: A404202



CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech II Semester Regular Examinations September-2023

Course Name: ANALOG ELECTRONIC CIRCUITS

(Electrical & Electronics Engineering)

Date: 08.09.2023 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 static and dynamic resistance of a diode. | 1 M |
| 2. | The common base D.C current gain of a transistor is 0.967. If the emitter current is 10mA. What is the value of base current. | 1 M |
| 3. | Define Drain resistance and amplification factor of the JFET. | 1 M |
| 4. | Draw the small signal model of JFET. | 1 M |
| 5. | What is the need of cascading in amplifiers? | 1 M |
| 6. | Mention the classification of power amplifiers based on its mode of operation. | 1 M |
| 7. | The gain of the amplifier is decreased to 1000 with negative feedback from its gain of 5000. Calculate the feedback factor and the amount of negative feedback in dB. | 1 M |
| 8. | Mention the advantages and disadvantages of RC oscillators. | 1 M |
| 9. | Draw the circuit diagram of inverting amplifier using op-amp. | 1 M |
| 10. | What are the ideal characteristics of an op-amp? | 1 M |

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- | | | |
|--------|---|----|
| 11.A). | i) Draw and explain the V-I characteristics of PN junction diode. | 5M |
| | ii) A silicon diode having an internal resistance of 20Ω is used in half wave rectifier. If the applied voltage is $50\sin(\omega t)$ and load resistance is 800Ω . Calculate Ripple Factor and Efficiency. | 5M |

OR

- | | | |
|---------|--|-----|
| 11. B). | Draw the circuit diagram of an NPN transistor in Common Emitter Configuration and describe the input and output characteristics. Also define active saturation and cutoff regions. | 10M |
| 12. A). | With the help of neat sketch and characteristics curves explain the operation of the D-MOSFET. | 10M |

OR

- | | | |
|---------|---|----|
| 12. B). | i) Draw the small signal equivalent circuit of CS amplifier. Derive the expressions for voltage gain, input and output impedances. | 6M |
| | ii) In the common drain amplifier, consider $R_s = 4K\Omega$, $R_G = 10M\Omega$, $\mu = 50$ and $r_d = 35K\Omega$. Calculate the voltage gain, input, and output impedances. | 4M |

(P.T.O..)

13. A). Draw the circuit diagram of two stage RC coupled amplifier. Explain its operation. 10M
Mention its advantages and disadvantages.

OR

13. B). Draw a neat circuit diagram of push pull class B amplifier. Explain its working. Also 10M
prove that its maximum efficiency is 78.55%.

14. A). Explain the effect of negative feedback on gain, stability and bandwidth of an amplifier 10M
with necessary derivation.

OR

14. B). i) Derive the expression for output frequency of Hartly Oscillator. 6M

ii) In a transistorized Colpits Oscillator the two capacitors are 10pF and 100pF. The 4M
frequency of oscillations is 200KHz and 2MHz. Calculate the range of inductance.

15. A). i) Define and explain input bias current and input off set current. 6M

ii) Draw the circuit diagram of non-inverting amplifier and derive the expression for its 4M
closed loop gain.

OR

15. B). Draw the circuit diagram of triangular waveform generator and explain its operation and 10M
draw the waveforms at each stage.

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R22

Course Code: A404201



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech II Semester Regular Examinations September-2023

Course Name: BASIC ELECTRONIC CIRCUITS

(Electronics & Communication Engineering)

Date: 08.09.2023 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 static resistance. 1 M
2. Illustrate the V-I characteristics of an ideal diode in forward bias. 1 M
3. List any three applications of diode. 1 M
4. State the key difference between a series clipper and a shunt clipper. 1 M
5. Define the terms "cut-off" and "saturation" when referring to a transistor switch. 1 M
6. What is the primary advantage of the common emitter configuration? 1 M
7. Draw the volt-ampere characteristics of FET. 1 M
8. Compare BJT and FET. 1 M
9. Draw the symbol of a photodiode and indicate terminals. 1 M
10. What is the primary application of a varactor diode? 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Analyze the working of PN diode in forward and reverse bias with the help of a neat characteristic curve. 10M

OR

11. B). Define diode switching time and describe its importance in electronic circuits. Explain the difference between the storage time, rise time, and fall time of a diode during switching. 10M

12. A). Demonstrate the operation of half wave rectifier with capacitor filter with neat diagrams. 10M

OR

12. B). i) State and prove clamping circuit theorem. 5M
ii) Explain clipping at two independent levels with circuit diagram and transfer characteristics. 5M

13. A). Illustrate the operation of CB Configuration of BJT and its input and output characteristics briefly. 10M

OR

13. B). Outline self-bias circuit and derive the expression for stability factor. 10M

14. A). i) Compare BJT and FET. 5M
ii) Explain the construction and operation of JFET with neat diagram. 5M

OR

14. B). Illustrate the operation of MOSFET in enhancement mode with neat sketches. 10M

(P.T.O.)

15. A). i) Illustrate the operation of UJT with its V-I characteristics. 5M
ii) Explain the operation of Zener diode as a voltage regulator. 5M

OR

15. B). Interpret the working of Tunnel diode and its V-I characteristics. 10M

H.T No:

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R22

Course Code: A405301



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech II Semester Regular Examinations September-2023

Course Name: DATA STRUCTURES

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

Date: 08.09.2023 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. Give the postfix and prefix forms of the expression:
 $A + B * (C - D) / (P - R)$ 1 M
2. Classify the different types of linked list. 1 M
3. Explain the rehashing technique with suitable example. 1 M
4. Describe the open addressing and chaining methods of collision resolution techniques in hashing. 1 M
5. List the applications of trees. 1 M
6. How do we calculate the balance factor for each node in an AVL tree? 1 M
7. What is meant by internal and external sorting? Give any two examples for each type. 1 M
8. Describe the complexity of quick sort. 1 M
9. Define Pattern Matching and Tries. 1 M
10. Write advantages of Knuth- Morris-Pratt algorithm. 1 M

PART-B

Answer the following. Each question carries TEN Marks.

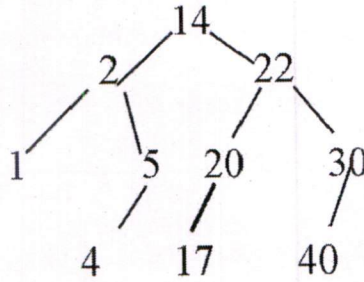
5x10=50M

- 11.A). Explain implementation of stack using linked list. 10M
- OR**
- 11.B). Develop an algorithm for deleting an element in a circular queue. 10M
- 12.A). Write a 'C' program to implement dictionary using linear list representation. 10M
- OR**
- 12.B). Given input {4371, 1323, 6173, 4199, 4344, 9679, 1989} and a hash function:
 $h(x) = x \pmod{10}$, show the resulting
(15) $h(x) = x \pmod{10}$, show the resulting
 - i) Open hash table
 - ii) Closed hash table using linear probing
 Closed hash table using quadratic probing
- 13.A). Define Binary search tree. Write a 'C' program to implement the following operations of BST. i) Insertion ii) In-order traversal. 10M

(P.T.O..)

OR

13. B). How does the AVL tree differ from binary search tree? For the given binary search tree, if we remove the root and replace it with something from left subtree. What will be the value of the new root? Justify your answer. 10M



14. A). Write an algorithm to implement merge sort. Sort out the following elements representing each pass: 11 6 3 24 46 22 7 16 4 23 10M

OR

14. B). Consider five cities: (1) New Delhi, (2) Mumbai, (3) Chennai, (4) Bangalore, and (5) Kolkata, and a list of flights that connect these cities as shown in the following table. Use the given information to construct a graph. 10M

Flight No	Origin	Destination
101	2	3
102	3	2
103	5	3
104	3	4
105	2	5
106	5	2
107	5	1
108	1	4
109	5	4
110	4	5

15. A). Explain following Pattern matching algorithms with example. 10M
i) Brute force
ii) Boyer-Moore algorithm

OR

15. B). Compare Standard Tries, Compressed Tries and Suffix tries. 10M

H.T No:

R22

Course Code: A405202



CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech II Semester Regular Examinations September-2023

Course Name: C PROGRAMMING & DATA STRUCTURES

(Common for CE & ME)

Date: 11.09.2023 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. Give the structure of C program. 1 M
2. List the types of storage classes. 1 M
3. In what way array is different from an ordinary variable? 1 M
4. Differentiate between break and continue. 1 M
5. What is a pointer variable? 1 M
6. What is self-referential structures? 1 M
7. What is Data Structure? 1 M
8. What are the applications of stack? 1 M
9. What is the main idea behind the selection sort? 1 M
10. Define searching. 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). What are the different format specifiers available for Input and Output statements. Explain with an example. 10M
- OR
11. B). State the purpose of Unary and conditional operators explain them with an example. 10M
12. A). How is 'switch' used as a multi-way selection statement? Explain with suitable example. 10M
- OR
12. B). Write a C program for 3x3 matrix multiplication. 10M
13. A). List and explain various basic string functions available in C. 10M
- OR
13. B). What is a function? List the different types of functions? Write a recursive function called power which returns the value of xn. 10M
14. A). What are the operations of a Stack? Explain them with a program. 10M
- OR
14. B). How the queue is implemented by linked list? 10M
15. A). Write a C program to perform searching operations using linear and binary search. 10M
- OR
15. B). Write a C program to sort the elements using Insertion sort. 10M

H.T No:

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R22

Course Code: A400101



CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech II Semester Regular Examinations September-2023

Course Name: ENGLISH FOR SKILL ENHANCEMENT

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

Date: 11.09.2023 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. Punctuate the given sentence 1 M
It is a fine idea let us hope that it is going to work
2. Choose the word closest in meaning to the underlined part from the given options 1 M
1. I didn't have adequate time to prepare.
a. Favorable b. Clear c. Insufficient d. Enough
3. Choose the appropriate homophones given in the brackets to fill in the blank and make it meaningful 1 M
You are not _____ (allowed/aloud) to play music in your room after eleven at night.
4. Choose the appropriate homophones given in the brackets to fill in the blank and make it meaningful 1 M
The teacher walked down the _____ (aisle, isle) between the rows of desks.
5. Differentiate the following confusing words and use them in your own sentences. 1 M
Confident-Confidant
6. Complete the sentences with suitable tense forms of the given verbs. 1 M
The teacher _____ (explain) the use of the verb to the class.
7. Identify the redundancy in the given sentence and rewrite it correctly. 1 M
The companies merged together last year.
8. Give the full form of GRE 1 M
9. Choose the correct pronoun in the given sentence 1 M
If any one of the sisters needs a ride, _____ (they/she) can call me.
10. Define what is intensive reading? 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Do you agree with Narayan that we need a Bharat brand of English? Why? 10M
- OR
11. B). i) Write a Paragraph on "Role of Students in Nation Building". 5M
ii) Fill in the blanks with right articles to make a meaningful paragraph. The Novel Coronavirus (also called covid-19) is ___ new strand of coronavirus found in animals and humans, which causes _____ respiratory illness. It was first reported in Wuhan, China in December 2019, and, before this, had not previously been identified in humans. At ___ time of writing (10th February 2020) there has been 40,484 people infected and 910 deaths so far. On January 30th, ___ WHO declared the novel coronavirus ___ public health emergency of international concern.

(P.T.O..)

12. A). i) At the bottom of the advertisement there was a small line: 'Lady candidates need not apply' What was Sudha Murthy's reaction to it. 5M
ii) Explain in detail about Murthy's attitude towards the interview at 'TELCO'. 5M

OR

12. B). i) What are the two important techniques of reading? Discuss. 5M
ii) Select the verb form that best fits in the blank: 5M
a). Nobody _____ (know/knows) when he will arrive.
b). Do you think that the manager and our supervisor _____ (understands, understand) the problem?
c). One of the boxes _____ (are/is) open.
d). Each of the students----- (spend, spends) six hours studying for classes every day of the week.
e). Politics _____ (have/has) made people do strange things.

13. A). Discuss the gist of 'Lessons from Online Learning'. 10M

OR

13. B). Write a letter to the chief warden complaining about lack of water for various reasons in the hostel and the disturbance it caused in attending the college in time. Sign yourself as Kiran. 10M
14. A). Write in detail the importance of art and literature in one's life according to APJ Abdul Kalam. 10M

OR

14. B). Read the passage carefully and write the précis of it 10M
Teaching is the noblest of professions. A teacher has a sacred duty to perform. It is he on whom rests the responsibility of moulding the character of young children. Apart from developing their intellect, he can inculcate in them qualities of good citizenship, remaining neat and clean, talking decently and sitting properly. These virtues are not easy to be imbibed. Only he who himself leads a life of simplicity, purity and rigid discipline can successfully cultivate these habits in his pupils. Besides a teacher always remain young. He may grow old in age, but not in spite. Perpetual contact with budding youths keeps him happy and cheerful. There are moments when domestic worries weigh heavily on his mind, but the delightful company of innocent children makes him overcome his transient moods of despair.

15. A). Some people think that robots are important for human's future development. Others think that robots have negative effects on society. Write an essay on it giving your opinion. 10M

OR

15. B). Correct and rewrite the given sentences: 10M
i). We went to the office by walk yesterday.
ii). He is twenty years old, isn't it?
iii). I am forty years.
iv). I know that he does not care others.
v). The office works from ten and five.
vi). It is a good habit to refer the dictionary.
vii). I saw an elephant in zoo.
viii). All the ministers accompanied with the Prime Minister.
ix). The two brothers love one another.
x). The more I hear pop music less I like it.

Hall Ticket No.

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Question Paper Code: A402201



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech II Semester Regular Examinations September-2023
(Regulation: CMRCET-R22)

Subject Name: BASIC ELECTRICAL ENGINEERING

(Common to CSC, CSM, CSD & AIM)

Date: 11.09.2023 AN

Time: 3 hours

Max.Marks:60

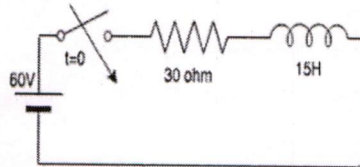
PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark.

10x1=10M

1. State Kirchoff's voltage law with suitable example. 1 M
2. Write the expression for the current for the circuit shown in figure. 1 M



3. Define average value of a sinusoidal quantity and Give its value. 1 M
4. Define resonance and List its significance? 1 M
5. Draw equivalent circuit of a transformer under no load condition and define each term. 1 M
6. List the three phase transformer common connections with necessary diagrams. 1 M
7. Define efficiency of dc machine and list its losses. 1 M
8. Draw the speed-torque characteristics of a squirrel cage induction motor. 1 M
9. What are the different types of wires and cables? 1 M
10. What is the necessity of earthing in domestic buildings? 1 M

PART-B

Answer any FIVE questions. One question from each unit either A or B (Compulsory)

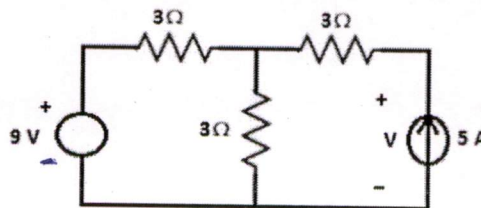
Each question carries TEN Marks.

5x10=50M

11. A. Explain in detail the volt-ampere relationship of R, L and C elements with neat diagrams. 10M

OR

11. B. i). In the circuit shown in figure, determine 'V' using Thevenin's theorem. 4M



- ii). Derive the expression of series RL transient with a DC voltage applied through it. Obtain the current, voltage and draw the decay transient of the circuit. 6M

(P.T.O..)

12. A. i). Find the RMS voltage of the sine signal. 5M
ii). A coil takes a current of 1 A at 0.6 lagging power factor from a 220 V, 60 Hz single phase source. If the coil is modeled by a series RL circuit, find 5M
a) The complex power in the coil and
b) The values of R and L.

OR

12. B. Explain about Star and Delta connected three phase balanced circuits. 10M
13. A. i). Derive an emf equation of a single phase transformer. 5M
ii). Derive the condition for maximum efficiency in a single phase transformer. 5M

OR

13. B. Explain different poly phase transformers connections. 10M
14. A. i). Discuss in detail, the load characteristics of DC Shunt generators 5M
ii). Explain the principle of operation of DC generator in detail. 5M

OR

14. B. i). Derive and explain rotating magnetic field in a three phase induction motor. 5M
ii). Explain the principle of operation of Single phase induction motor. 5M
15. A. Explain the functions of FUSE and SFU with neat sketches. 10M

OR

15. B. Explain the different types of batteries in detail. Also describe characteristics. 10M

H.T No:

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R22

Course Code: A401301



CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech II Semester Regular Examinations September-2023

Course Name: **BUILDING MATERIALS, CONSTRUCTION & PLANNING**

(Civil Engineering)

Date: 13.09.2023 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 the term dressing of stones. 1 M
2. State the requirements of good preservative for timber. 1 M
3. What are the ingredients of Portland cement? 1 M
4. Define hydration of cement. 1 M
5. What are the uses of lintel ? 1 M
6. What are the good characteristics of a good ventilation.? 1 M
7. What is underpinning? 1 M
8. Define residential building. 1 M
9. What is header and stretcher. 1 M
10. How orientation of building is important.? 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). i) What are the various methods of quarrying of stones? Explain each method briefly. 5M
ii) Analyze the advantages and application of Aluminum, examining its role in various industries and its impact on modern technology. 5M

OR

- 11.B). i) What are the constituents of good brick earth? Explain about the functions of its ingredients. 5M
ii) Explain different types of defects in timber. 5M

- 12.A). i) Explain about the dry process of manufacture of cement with flow diagram. 5M
ii) List any four admixtures and explain in brief. 5M

OR

- 12.B). i) Explain briefly about the soundness of cement 5M
ii) What are the Bouge's compounds? Explain in detail how each one of these compounds influences the strength and setting properties of cement. 5M

- 13.A). i) Summarize the functions of arches and lintels. Discuss relative merits and demerits of lintels over arches. 5M
ii) Evaluate and justify the essential criteria for achieving optimal acoustic design and discuss factors affecting the acoustic design. 5M

OR

- 13.B). i) Classify the types of footings and explain with neat sketches. 5M
ii) Draw the plan and elevation and section of a Glazed and half paneled door. 5M

(P.T.O.)

14. A). i) Explain types of scaffolding with a neat sketch. 5M
ii) Differentiate stone masonry and brick masonry. 5M

OR

14. B). Explain about English bond Flemish bond and draw the plan and elevation of one and half brick wall showing English and Flemish bond. 10M

15. A). i) Explain building bye laws for off sets and for open area in buildings. 5M
ii) List out different principles in planning a building. State the importance of site plan and location plan in the engineering drawing. 5M

OR

15. B). i) Briefly explain about Bye-laws for plinth area requirements. 5M
ii) Explain about the classifications of buildings. 5M

H.T No:

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R22

Course Code: A403301



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech II Semester Regular Examinations September-2023

Course Name: **ENGINEERING MATERIALS**

(Mechanical Engineering)

Date: 13.09.2023 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. List mechanical properties of metals. 1 M
2. What is ASTM in testing full form? 1 M
3. What is the difference between metals and metal alloys? 1 M
4. What are the main properties of copper? 1 M
5. What are the types of matrices used in composite materials? 1 M
6. What are the applications of hand lay-up process? 1 M
7. Which carbon is used in pencil? 1 M
8. Why is polymer important? 1 M
9. What is nanotechnology? 1 M
10. What is the benefit of nanoparticles? 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). What are the classifications of engineering materials? What is the Ashby materials selection chart diagram? 10M

OR

11. B). Can you explain the concept of elastic deformation and plastic deformation in materials? How do these two behaviors differ in terms of stress-strain curves? 10M

12. A). Describe the compositions, characteristics and industrial applications of gray cast iron. 10M

OR

12. B). Describe the compositions, properties and industrial applications of titanium and its alloy. 10M

13. A). Discuss the advantages and disadvantages of using natural fiber composites compared to synthetic fiber composites. 10M

OR

13. B). Explain the key steps involved in the filament winding process for fabricating composites materials. Discuss advantages, and limitations. 10M

(P.T.O..)

14. A). What are the methods and techniques used in the fabrication of ceramics? What are the applications of ceramics? 10M

OR

14. B). What is the fundamental distinction between thermoplastic and thermosetting polymers? What are elastomers and examples? 10M

15. A). Describe characteristics and applications of zinc oxide nanoparticles. 10M

OR

15. B). What are properties and applications of silver and gold nanoparticles in various fields? 10M
