

I B. Tech I Semester Regular Examinations, January-2024
BASIC CIVIL AND MECHANICAL ENGINEERING

(Common to EEE, CSE, Chemical, FT, PT, Ph. E)

Time: 3 hours

Max. Marks: 70

Note: 1. Question paper consists of two parts (Part-A and Part-B)
2. All the questions in Part-A is Compulsory
3. Answer ONE Question from Each Unit in Part-B

PART –A (10 Marks)

- | | | | |
|----|----|--|------|
| 1. | a) | Write various disciplines of civil engineering. | [1M] |
| | b) | What are the leveling instruments used for leveling? | [1M] |
| | c) | What is Hydrology? | [1M] |
| | d) | Write the types of Pavements. | [1M] |
| | e) | What are the construction materials? | [1M] |
| | f) | List the mechanical engineer work on marine sectors. | [1M] |
| | g) | Define composite. | [1M] |
| | h) | Define smart manufacturing. | [1M] |
| | i) | Compare Otto and Diesel cycles. | [1M] |
| | j) | List the gear drives applications. | [1M] |

PART – B (60 Marks)

Basic Civil Engineering

UNIT-I

- | | | | |
|----|----|--|------|
| 2. | a) | Discuss the role of civil engineers in society. | [5M] |
| | b) | Discuss about the various types of Aggregates with their sizes and shapes. | [5M] |

(OR)

- | | | | |
|---|----|---|------|
| 3 | a) | Explain the importance of Building Construction and Planning. | [5M] |
| | b) | Explain the purpose of studying Geo-technical Engineering. | [5M] |

UNIT-II

- | | | | |
|----|----|--|------|
| 4. | a) | Write a few objectives of Surveying. | [5M] |
| | b) | What is leveling? Write a few types of leveling. | [5M] |

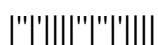
(OR)

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|----|----|---|------|
| 5. | a) | Explain how to do Angular Measurements using surveying instruments? | [5M] |
| | b) | Write briefly about contour mapping. | [5M] |

UNIT-III

- | | | | |
|----|----|-------------------------------------|------|
| 6. | a) | Discuss about Rainwater Harvesting. | [5M] |
| | b) | Explain the Sources of water. | [5M] |

(OR)



7. Write the importance of Transportation in Nation's economic development. [10M]

Basic Mechanical Engineering

UNIT-I

8. a) Explain the mechanical engineer work on automotive sectors. [5M]
b) Discuss the types, properties and applications of ceramics. [5M]

(OR)

9. a) Explain the classification of engineering materials. [5M]
b) Define smart material. Explain the types of smart materials and their functions. [5M]

UNIT-II

10. a) What are the important types of metal joining processes? [5M]
b) Discuss the types of CNC's and enlist the profitable applications of CNC? [5M]

(OR)

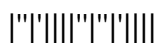
11. a) State advantages and limitations of water tube boilers. [5M]
b) Discuss the classification of IC engines. [5M]

UNIT-III

12. a) Describe the working principle of nuclear power plants. [5M]
b) Explain the open belt and cross belt drive in power transmission. Also give the applications. [5M]

(OR)

13. a) Sketch a robot and name its parts. [5M]
b) Explain the different applications of robots. [5M]



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PART –A (10 Marks)

- | | | | |
|----|----|--|------|
| 1. | a) | Write the scope of studying structural engineering. | [1M] |
| | b) | Discuss the purpose of Surveying. | [1M] |
| | c) | Write a few types of Dams. | [1M] |
| | d) | Write the specifications for quality of water. | [1M] |
| | e) | Write the types of measurements in surveying. | [1M] |
| | f) | List any four applications of smart materials. | [1M] |
| | g) | What is 3D Printing? List its applications. | [1M] |
| | h) | Differentiate between SI and CI engine. | [1M] |
| | i) | Enlist various belt drives. Name any three belt materials. | [1M] |
| | j) | Write the name of different types of power plant. | [1M] |

PART – B (60 Marks)

Basic Civil Engineering

UNIT-I

- | | | | |
|----|----|---|------|
| 2. | a) | Write the ingredients used in Cement concrete and its proportions. | [5M] |
| | b) | Write the purpose of studying Hydraulics and Water Resources Engineering. | [5M] |

(OR)

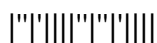
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|----|----|--|------|
| 3. | a) | Explain the purpose of studying Environmental Engineering. | [5M] |
| | b) | Write the purpose of studying Transportation Engineering. | [5M] |

UNIT-II

- | | | | |
|----|----|--|------|
| 4. | a) | Explain how to do Horizontal Measurements using surveying instruments. | [5M] |
| | b) | Explain about compass Surveying. | [5M] |

(OR)

- | | | | |
|----|----|--|------|
| 5. | a) | Explain the purpose of Leveling instruments. | [5M] |
| | b) | Write a few temporary adjustments in Leveling instruments. | [5M] |



UNIT-III

6. a) Explain any two types of Highway Pavements. [5M]
b) Write the various instruments used for horizontal measurement. [5M]

(OR)

7. a) Write the difference between Flexible Pavements and Rigid Pavements. [5M]
b) Discuss about the need of a) Harbour b) Tunnel c) Airport. [5M]

Basic Mechanical Engineering**UNIT-I**

8. a) Explain the mechanical engineer work on marine sectors. [5M]
b) List Engineering Materials on basis of natural and manmade existence. [5M]

(OR)

9. a) State the composition and application of any four ferrous metals. [5M]
b) What are the key applications of composite materials in Aerospace and Automotive industries? [5M]

UNIT-II

10. a) What is casting? Explain the principle of casting with neat sketch. [5M]
b) Using a block diagram, explain components of a CNC machine. [5M]

(OR)

11. a) What are the industrial applications of air conditioning? [5M]
b) List the components of electric vehicles? Explain. [5M]

UNIT-III

12. a) Explain the working principle of hydro power plant with neat sketch. [5M]
b) Write short note on chain drives. [5M]

(OR)

13. a) List the types of robot configurations? Explain any one with neat sketch. [5M]
b) Explain the use of robots in medical applications. [5M]

2 of 2



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PART –A (10 Marks)

- | | | | |
|----|----|--|------|
| 1. | a) | Write any four construction materials. | [1M] |
| | b) | Write a few instruments used in Surveying. | [1M] |
| | c) | Draw the sketch of dam. | [1M] |
| | d) | Write the types of chains in surveying. | [1M] |
| | e) | Write briefly about Conveyance Structures. | [1M] |
| | f) | What is the role of mechanical engineering in society? | [1M] |
| | g) | Define casting. List the casting defects. | [1M] |
| | h) | List out the applications of refrigeration system. | [1M] |
| | i) | What is the difference between belt drive and chain drive? | [1M] |
| | j) | List the various degrees of freedom in robot configurations. | [1M] |

PART – B (60 Marks)

Basic Civil Engineering

UNIT-I

- | | | | |
|----|----|--|------|
| 2. | a) | Explain about Prefabricated construction Techniques. | [5M] |
| | b) | Discuss the role of steel in building construction. | [5M] |

(OR)

- | | | | |
|----|----|--|------|
| 3. | a) | Explain about the mix proportion of cement concrete. | [5M] |
| | b) | Explain any two basic tests on cement concrete. | [5M] |

UNIT-II

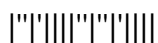
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|----|----|--|------|
| 4. | a) | Write the importance of using leveling instrument in civil construction works. | [5M] |
| | b) | Explain how to use leveling instrument on site. | [5M] |

(OR)

- | | | | |
|----|----|--|------|
| 5. | a) | Write the purpose of drawing contours. | [5M] |
| | b) | Explain about contour intervals with sketch. | [5M] |

UNIT-III

- | | | | |
|----|----|--|------|
| 6. | a) | Draw hydrological cycle and mention its parts. | [5M] |
| | b) | What are the components and functions of rigid pavement? | [5M] |



(OR)

7. a) What are the components and functions of flexible pavement? [5M]
b) Explain about Quality of water. [5M]

Basic Mechanical Engineering**UNIT-I**

8. a) Compare mechanical engineering to the other traditional engineering fields. [5M]
b) Write the differences between Ferrous and Non-Ferrous metals. [5M]

(OR)

9. a) Explain composite materials with its properties and applications. [5M]
b) Explain types and properties of ceramics. [5M]

UNIT-II

10. a) Explain the manufacturing process of forming. [5M]
b) Write short note on smart manufacturing. [5M]

(OR)

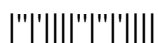
11. a) List the components of hybrid vehicles? Explain. [5M]
b) Explain the working of two stroke petrol engine with neat sketch. [5M]

UNIT-III

12. a) Describe the working principle of steam power plants. [5M]
b) Write a short note on the classification of gears. [5M]

(OR)

13. a) Write short note on robot joints and links. [5M]
b) "Robots find applications not only in the industry"- Explain three non-industrial applications of robots. [5M]



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1. a) Write the various sizes of Bricks. [1M]
- b) What is the use of chain survey? [1M]
- c) Write the difference between Azimuth and Bearing. [1M]
- d) What is reservoir? [1M]
- e) What is the purpose of cement? [1M]
- f) Write about Rope Drives. [1M]
- g) Compare four stroke engines with two stroke engines. [1M]
- h) Why diesel engines have higher compression ratio compared to petrol engines? [1M]
- i) State the importance of power plants. [1M]
- j) Write a note on movements of Robots. [1M]

PART - B (60 Marks)**Basic Civil Engineering****UNIT-I**

2. a) Write about various grades of cement and its applications. [5M]
- b) Explain any two basic tests on cement. [5M]

(OR)

3. a) Explain any two basic tests on aggregates. [5M]
- b) Write few types of cement and its applications. [5M]

UNIT-II

4. a) Explain step by step procedure of locating contours. [5M]
- b) Explain about measurement of Angles. [5M]

(OR)

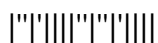
5. a) What are the accessories for a chain survey? Explain the functions of each. [5M]
- b) What is different between magnetic bearing and true bearing? [5M]

UNIT-III

6. a) Write the purpose of reservoirs. [5M]
- b) Explain about Railway Engineering. [5M]

(OR)

1 of 2



7. a) How Transportation engineering is important in economic development? Discuss. [5M]
b) Write a note on Hydrology and its ways of structuring. [5M]

Basic Mechanical Engineering

UNIT-I

8. a) What is mechanical engineering? Explain the role of mechanical engineering in industries. [5M]
b) Define smart materials. List the properties and applications of smart materials. [5M]

(OR)

9. a) Define ferrous and Nonferrous material with examples. [5M]
b) Define a composite material. How are composite materials classified? Give example for each. [5M]

UNIT-II

10. a) Define CNC? Explain the important features of CNC machines. [5M]
b) Write short note on 3D printing. [5M]

(OR)

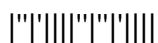
11. a) Derive an expression to find the efficiency of an Otto cycle. [5M]
b) Define one ton of refrigeration. Explain the properties of ideal refrigerants. [5M]

UNIT-III

12. a) Draw general layout of Hydro-Electric Power plant showing all components. [5M]
b) Write short note on Gear drives and its applications. [5M]

(OR)

13. a) Justify the statement: Actuators are the muscles of robots. [5M]
b) Briefly explain the need for robots in industries. [5M]



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2. All the questions in Part-A is Compulsory

3. Answer ONE Question from each Unit in Part-B

PART –A (10 Marks)

- | | | | |
|----|----|--|------|
| 1. | a) | What is meant by a closed circuit? | [1M] |
| | b) | State Kirchoff's voltage law. | [1M] |
| | c) | What is the function of a D.C motor? | [1M] |
| | d) | What is meant by electric shock? | [1M] |
| | e) | Write the function of electrical measuring instrument. | [1M] |
| | f) | Draw PN junction of a diode. | [1M] |
| | g) | Write two benefits of Nano electronics. | [1M] |
| | h) | Write the function of a capacitor filter. | [1M] |
| | i) | Draw the symbols of OR and NOT gates. | [1M] |
| | j) | Write the representation of decimal system. | [1M] |

PART – B (60 MARKS)

Basic Electrical Engineering

UNIT-I

- | | | |
|----|--|-------|
| 2. | State and prove super position theorem for an electrical 'T' network excited with two equal D.C sources. | [10M] |
|----|--|-------|

(OR)

- | | | | |
|---|----|---|------|
| 3 | a) | Draw impedance triangle and explain the resultant impedance with relevant relations. | [5M] |
| | b) | An alternating voltage is having the equation as $V=167.8\sin 314t$. Find the R.M.S voltage, frequency and the instantaneous voltage when $t=3.7\text{ms}$? | [5M] |

UNIT-II

- | | | |
|----|--|-------|
| 4. | Draw the construction diagram and explain in detail about the working principle of single phase transformer. | [10M] |
|----|--|-------|

(OR)

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|----|----|--|------|
| 5. | a) | Elaborate the essential features of indicating instruments with diagrams. | [5M] |
| | b) | Find the e.m.f generated by a 6 pole D.C generator having 440 conductors and driven at a speed of 1400 r.p.m connected as lap and wave windings? The flux per pole is 0.032wb. | [5M] |

UNIT-III

- | | | | |
|----|----|--|------|
| 6. | a) | Compare the non earthed and earthed electrical networks with advantages. | [5M] |
| | b) | Explain the electricity bill calculation of a domestic consumer with an example. | [5M] |

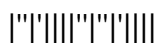
(OR)

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|----|--|-------|
| 7. | Draw neat diagram and explain the over load protection by using miniature circuit breaker. | [10M] |
|----|--|-------|

Basic Electronics Engineering

UNIT-I

- | | | | |
|----|----|---|------|
| 8. | a) | Discuss in detail about the advantages and disadvantages of electronic components and switches. | [5M] |
| | b) | Derive and analyze the common base characteristics of a transistor configuration. | [5M] |



(OR)

9. a) Draw and explain the junction break down characteristics of a zener diode. [5M]
b) A diode with 720mW maximum power dissipation at 25⁰C has a 5.2mW/⁰C derating factor. If the forward voltage drop remains constant at 0.8V, find the maximum forward current at 25⁰C and at 70⁰C. [5M]

UNIT-II

10. Describe the working of a full wave bridge rectifier with output waveforms. [10M]

(OR)

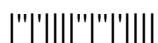
11. a) Write briefly about the requirements and specifications of DC power supply. [5M]
b) Summarize the outputs and outcomes of a zener voltage regulator circuit. [5M]

UNIT-III

12. a) Describe the functions of registers and counters with an example. [5M]
b) Find the decimal numbers of the following binary numbers. [5M]
i) 110100 ii) 110111 iii) 1111111

(OR)

13. a) Draw the basic circuit diagram and explain the operation of Flip-flop. [5M]
b) State and prove associative and distributive laws of Boolean algebra with example. [5M]



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PART –A (10 Marks)

- | | | | |
|----|----|---|------|
| 1. | a) | What is meant by an open circuit? | [1M] |
| | b) | State Kirchoff's current law. | [1M] |
| | c) | Write the function of a D.C generator. | [1M] |
| | d) | What is meant by transformer core? | [1M] |
| | e) | What is the indication of power rating of electrical equipment? | [1M] |
| | f) | What is meant by a vacuum tube? | [1M] |
| | g) | Indicate the terminals of diode symbol. | [1M] |
| | h) | Draw the output voltage wave of a rectifier. | [1M] |
| | i) | Draw the symbols of OR and NOR gates. | [1M] |
| | j) | Write about the junctions of a bipolar junction transistor. | [1M] |

PART – B (60 MARKS)

Basic Electrical Engineering

UNIT-I

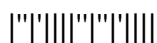
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|----|----|--|-------|
| 2. | | State and prove super position theorem for an electrical 'T' network excited with two unequal D.C sources. | [10M] |
| | | (OR) | |
| 3. | a) | Draw power triangle and explain the resultant impedance with relevant relations. | [5M] |
| | b) | An alternating current has an effective value of 214A. If its frequency is 50Hz, determine the average value and write the expression for the current. | [5M] |

UNIT-II

- | | | | |
|----|----|---|-------|
| 4. | | Draw the construction diagram and explain in detail about the working principle of a DC electrical machine having rotation as output. | [10M] |
| | | (OR) | |
| 5. | a) | Draw the diagram and explain the working principle of permanent magnet moving coil instrument. | [5M] |
| | b) | A wave connected armature winding has 19 slots with 44 conductors per slot. If the flux per pole is 0.066wb and the number of poles is 8, calculate the speed at which the generator should run to give 564V? Calculate the speed if the armature is lap connected. | [5M] |

UNIT-III

- | | | | |
|----|----|---|------|
| 6. | a) | Elaborate different types of earthing methods and disadvantages. | [5M] |
| | b) | Write briefly about the essential requirements of hydel power generation. | [5M] |
| | | (OR) | |
| 7. | a) | Differentiate conventional and non-conventional energy resources. | [5M] |
| | b) | How to calculate the electricity bill for domestic consumer? Give examples. | [5M] |



Basic Electronics Engineering**UNIT-I**

8. a) Draw and explain the forward and reverse characteristics of a PN junction diode. [5M]
b) Derive and analyze the common emitter characteristics of a transistor configuration. [5M]

(OR)

9. a) Describe the reverse break down operation of a zener diode with characteristics. [5M]
b) Find the maximum and minimum levels of V_F for a germanium diode with $V_F=0.4V$ at $20^{\circ}C$ when operated over a temperature range of $12^{\circ}C$ to $88^{\circ}C$. Find the device dynamic resistances at the temperature extremes if I_F is 17mA. [5M]

UNIT-II

10. Draw circuit diagram and explain the working principle of zener voltage regulator. [10M]

(OR)

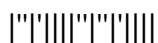
11. a) Write briefly about the characteristic features of capacitor filter. [5M]
b) List out the components and write the functions of public address system. [5M]

UNIT-III

12. a) Explain the functionality of sequential circuits with block diagram. [5M]
b) Find the decimal number of the following binary numbers. [5M]
i) 110011.11001 ii) 1010.1100 iii) 1110.1011

(OR)

13. a) Derive and explain the truth table of XNOR gate with circuit diagram. [5M]
b) State and prove commutative, associative laws of Boolean algebra with an example. [5M]



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PART -A (10 Marks)

1. a) What is meant by a series circuit? [1M]
- b) Draw the indications of DC and AC supply voltages. [1M]
- c) Define e.m.f of a D.C generator. [1M]
- d) Define tariff of electrical energy. [1M]
- e) What is meant by controlling torque of an instrument? [1M]
- f) What is meant by a PN junction? [1M]
- g) Write two benefits of electronic circuits. [1M]
- h) Draw the output current of a full wave rectifier. [1M]
- i) Draw the symbols of NOT and AND gates. [1M]
- j) Write the representations of binary system. [1M]

PART - B (60 MARKS)

Basic Electrical Engineering

UNIT-I

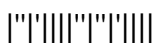
2. Derive the expressions and analyze the voltage-current relationships of R,L,C elements with waveforms. [10M]
- (OR)**
- 3 a) Derive and explain the average value of an alternating current with necessary waveforms. [5M]
 - b) A 50Hz sinusoidal voltage is given as $e=212\sin\omega t$ is supplied to a pure resistance of 24 ohms. Write the equation for the current and power? Determine the R.M.S current and average power? Also draw the phasor diagram. [5M]

UNIT-II

4. Draw the construction diagram and explain in detail about the working principle of a synchronous generator. [10M]
- (OR)**
5. a) Draw the diagram and explain the working principle of attraction type moving iron instrument. [5M]
 - b) A 44kVA, 1000/415V, 50Hz single phase transformer has 88 turns on the primary. Find i) The number of turns on the secondary, ii) The full load primary and secondary currents and iii) The maximum value of the flux. [5M]

UNIT-III

6. a) Write briefly about the two part electricity tariff with an example. [5M]
 - b) Summarize the safety precautions to prevent the electric shock. [5M]
- (OR)**
7. Draw the layout diagram and explain in detail about the working principle of wind power generation. [10M]



Basic Electronics Engineering**UNIT-I**

8. a) List out and explain various parameters of a diode. [5M]
b) Derive and analyze the common collector characteristics of a transistor configuration. [5M]

(OR)

9. a) Draw the symbol and discuss about various parameters of a Zener diode. [5M]
b) A diode with a 1.2W maximum power dissipation at 22°C has a 4mW/°C derating factor. Find the maximum power that may be dissipated in the diode when its temperature is 78°C. [5M]

UNIT-II

10. By using the block diagram, explain in detail about the working of public address system. [10M]

(OR)

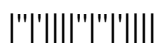
11. a) Explain the frequency response of common emitter RC coupled amplifier with relevant relations. [5M]
b) List out the components and explain briefly about the electronic instrumentation system. [5M]

UNIT-III

12. a) Derive the output and analyze the half adder circuit with diagram. [5M]
b) Find the binary form representation of the following decimal numbers. [5M]
i) 22.5 ii) 12.725 iii) 0.8657

(OR)

13. a) Derive and explain the truth table of XOR gate with circuit diagram. [5M]
b) Explain in detail about the basic properties of Boolean algebra associated with 'OR' operation. [5M]



I B. Tech I Semester Regular Examinations, January-2024
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to CE, ME, ECE, IT, AME, Mining, Robotics, Agri E, ECE-Allied, CSE- Allied)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question paper consists of two parts (Part-A and Part-B)*
2. All the questions in Part-A is Compulsory
3. Answer ONE Question from each Unit in Part-B

PART -A (10 Marks)

- | | | | |
|----|----|---|------|
| 1. | a) | Define phase angle of AC quantities. | [1M] |
| | b) | What is the output of an alternator? | [1M] |
| | c) | What is meant by a parallel circuit? | [1M] |
| | d) | Define the 'unit' of electricity billing. | [1M] |
| | e) | Write the limitations of ohm's law. | [1M] |
| | f) | Write the main features of PN junction diode. | [1M] |
| | g) | Draw the symbol of zener diode. | [1M] |
| | h) | What is meant by an amplifier? | [1M] |
| | i) | Draw the symbols of NOT and NOR gates. | [1M] |
| | j) | Draw the truth table of AND gate. | [1M] |

PART - B (60 MARKS)

Basic Electrical Engineering

UNIT-I

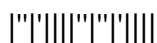
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|----|----|--|-------|
| 2. | | Derive the expressions and analyze the voltage-current relationships of R,L,C elements with phasor diagrams. | [10M] |
| | | (OR) | |
| 3. | a) | Derive and explain the root mean square value of an alternating current with necessary waveforms. | [5M] |
| | b) | A coil wire carries simultaneously the instantaneous currents as $i_1=15\sin\omega t$ Amps and $i_2=12\sin(\omega t+60^\circ)$ Amps. Calculate the total current, the total power expended in the coil if the resistance of the coil is 17 ohms and the energy consumed by the coil when the two currents flow through it for 5 hours. | [5M] |

UNIT-II

- | | | | |
|----|----|---|-------|
| 4. | | Draw the construction diagram and explain in detail about the working principle of three phase induction motor. | [10M] |
| | | (OR) | |
| 5. | a) | Draw the diagram and explain the working principle of repulsion type moving iron instrument. | [5M] |
| | b) | A single phase transformer has 660 turns on the primary and 92 turns on the secondary. If the primary is connected to 3600V supply, calculate the secondary voltage? If the secondary current is 218A find the primary current. | [5M] |

UNIT-III

- | | | | |
|----|----|---|------|
| 6. | a) | Explain in detail about the advantages and disadvantages of solar power generation systems. | [5M] |
| | b) | Discuss about the importance of power rating of electrical appliances with an example. | [5M] |



(OR)

7. Draw the layout diagram and explain in detail about the working principle of nuclear, solar power generation. [10M]

Basic Electronics Engineering**UNIT-I**

8. a) Derive and explain in detail about the DC equivalent circuit of a junction diode. [5M]
b) A zener diode with $V_Z=4.7V$ has Z_Z equal to 24 ohms when $I_Z=27mA$. Find the upper and lower limits of V_Z changes by $\pm 4mA$. [5M]

(OR)

9. a) Draw the circuit diagram and explain the small signal CE amplifier operation. [5M]
b) Derive and analyze the forward and reverse bias characteristics of a diode. [5M]

UNIT-II

10. With a neat sketch, describe the working of electronic instrumentation system. [10M]

(OR)

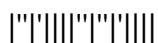
11. a) Explain the working principle of common emitter RC coupled amplifier with circuit diagram. [5M]
b) Derive and explain the output voltage waveforms of a full wave rectifier. [5M]

UNIT-III

12. a) Explain the generation of BCD code and Gray Code. [5M]
b) Convert the following decimal number in to base-2 numbers. [5M]
i) 17 ii) 0.75725 iii) 11.822

(OR)

13. a) Explain the properties of hamming code with an example. [5M]
b) Explain in detail about the basic properties of Boolean algebra associated with 'AND' operation. [5M]



I B. Tech I Semester Supplementary Examinations, Jan/Feb-2024
PROGRAMMING FOR PROBLEM SOLVING USING C

(Common to EEE, ME, ECE, CSE, CSE-CS&T, EIE, IT, ECT, Auto Eng, Min Eng, Pet Eng, CSE-AI&ML, CSE-AI, CSE-DS, CSE-AI&DS, CSE-CS, CSE-IOT &CS Incl BCT, CSE-CS & BS, CSE-IOT, Food Eng, AI&DS)

Time: 3 hours

Max. Marks: 70

Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks

UNIT-I

1. a) List out various program development steps in Problem solving. [7M]
 b) What is an Expression? Write the priority and associativity rules of different arithmetic operators in C. And Evaluate $5+10/5*6\%3$. [7M]

(OR)

2. a) Define variable. What are the rules for declaring the variables? [7M]
 b) Write the importance of precedence and associativity. Write the table for operator precedence. [7M]

UNIT-II

3. a) Write a C program to calculate the grades of a student using if else ladder statement. [7M]

Marks	Grade of a student
>90	A
70-90	B
50-70	C
40-50	D
<40	FAIL

- b) Compare the use of if-else construct with that of conditional operator. Explain with examples. [7M]

(OR)

4. a) Develop a program for the printing following pattern on the screen. [7M]

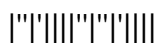
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*
* *
* * *
* * * *
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- b) Develop a C program to make a simple calculator to add, subtract, multiply and divide using switch...case. [7M]

UNIT-III

5. a) Develop a C program to concatenate two strings and display in another string with and without using string handling function? [7M]

- b) List the differences between structures and unions. Explain with an example. [7M]

(OR)

6. a) Develop a C program to declare a structure with the following elements and for accessing them. [7M]
i). Name ii) Age iii) University

b) Explain about the two-dimensional array and its operations with example. [7M]

UNIT-IV

7. a) Write short notes on pointer. Develop a C program that uses a pointer as a function argument. [7M]

b) Define a pointer in C language. Write the syntax to declare the pointer variable. [7M]

(OR)

8. a) Define dynamic memory. Describe the functions to allocate dynamic memory. [7M]

b) Develop a program to print largest number in the given two numbers using pointers and functions. [7M]

UNIT-V

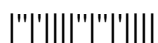
9. a) Write a C program for finding the GCD among two numbers using recursion. [7M]

b) Write a C program using the concept of functions to swap the values of variables without using third variable. [7M]

(OR)

10. a) Explain function prototype and explain different methods to call the functions. [7M]

b) Write a C Program to read the contents of a file and display the contents on console and close it. [7M]



I B. Tech I Semester Supplementary Examinations, Jan/Feb- 2024**APPLIED CHEMISTRY**

(Common to EEE, ECE, CSE, EIE, IT)

Time: 3 hours

Max. Marks: 75

*Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks*

UNIT-I

1. a) Describe the preparation, properties and applications of Thiokol polymer. [8M]
b) Discuss the emulsion polymerization with appropriate discussion and illustrations. [7M]

(OR)

2. a) Write a note on conducting polymers and biodegradable polymers. [8M]
b) Provide the preparation method and applications of polycarbonates. [7M]

UNIT-II

3. a) Discuss the chemical and electrochemical theories of corrosion. [8M]
b) Write a detailed note on lithium-ion battery. [7M]

(OR)

4. a) Write a brief note on calomel electrode and standard hydrogen electrode. [8M]
b) Discuss the cathodic protection. [7M]

UNIT-III

5. a) Explain how the zone refining and diffusion are useful in the preparation of semiconductors. [8M]
b) Discuss the Hall effect and its applications. [7M]

(OR)

6. a) Write a note on the types and applications of liquid crystals. [8M]
b) Describe how the SEM is useful in characterizing Nano materials. [7M]

UNIT-IV

7. a) Describe acid-base controlled molecular shuttle. [8M]
b) Write about molecular switches Rotaxanes and Catenanes. [7M]

(OR)

8. a) Write a note on autonomous light-powered molecular motor. [8M]
b) Discuss Ab Initio studies. [7M]

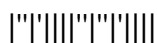
UNIT-V

9. a) Discuss the instrumentation of IR spectroscopy. [8M]
b) Explain the terms chromophores and auxochromes in detailed. [7M]

(OR)

- 10 a) Draw the schematic diagram of photovoltaic cell and discuss its advantages and disadvantages. [8M]
b) Write about the design and working of tidal and wave power energy sources. [7M]

1 of 1



I B. Tech I Semester Supplementary Examinations, Jan/Feb-2024**APPLIED PHYSICS**

(Common to ECE, CSE, IT, EIE, E Com E)

Time: 3 hours

Max. Marks: 70

*Note: 1. Question Paper consists of two parts (Part-A and Part-B)**2. All the questions in Part-A is Compulsory**3. Answer any FOUR Questions from Part-B***PART –A(14 Marks)**

1. a) Why Newton's rings are circular in shape. [2M]
- b) Distinguish between Fraunhofer and Fresnel diffraction. [2M]
- c) Explain scalar field with examples. [2M]
- d) With energy level diagram explain the term population inversion. [2M]
- e) Write the condition for normalization of the wave function. [2M]
- f) What is Fermi factor? [2M]
- g) Define drift and diffusion currents. [2M]

PART –B (56 Marks)

2. a) Explain the working of Michelson interferometer and describe how refractive index of a material is determined. [10M]
- b) In Michelson's interferometer 200 fringes crossed the field of view when the movable mirror is displaced through a distance of 0.0589mm. Find the wavelength of light used. [4M]
3. a) Define resolving power of an optical instrument. Derive an expression for the Resolving power of a microscope. [10M]
- b) Draw the intensity distribution curve of a grating when it is exposed to a monochromatic light. [4M]
4. a) Define specific rotation. Describe the construction and working of Laurent's half Shade polarimeter. [10M]
- b) Explain the working principal Nicol prism with the help of a neat ray diagram. [4M]
5. a) Derive electromagnetic wave equation in dielectric medium. [10M]
- b) Define curl of a vector field and explain its physical significance. [4M]
6. a) Explain Fermi-Dirac distribution function. Explain how it varies with temperature with the help of plots. [10M]
- b) Explain the physical significance of the wave function ' ψ ' (psi). [4M]
7. a) What is an energy band? Classify solids into conductors, semiconductors and Insulators on the basis of band theory of solids. [10M]
- b) Write short notes on effective mass of an electron. [4M]

