# FACULTY OF ENGINEERING

**B.E. II / IV (Civil) I - Semester (NON-CBCS) (Backlog) Examination,**
**March / April 2022**
**Subject: Engineering Materials and Construction**

**Time: 3 Hours**                                                     **Max. Marks: 75**
**(Missing data, if any, may be suitably assumed)**
**PART – A**
**Note: Answer all questions.**                                      **(25 Marks)**

1   Define Bulking of sand.
2   Define Form work and Scaffolding.
3   State the methods of quarrying.
4   What is meant by voids in fine aggregate? How is it measured?
5   What are the properties of good coarse aggregate?
6   Enumerate various types of cement.
7   State the characteristics of a good paint.
8   Define paint, varnish and distemper.
9   Distinguish random rubble masonry and coursed rubble masonry.
10  Draw a neat sketch of semicircular arch with labelling.

# PART – B

**Note: Answer any five questions.**                                 **(5 x 10 = 50 Marks)**

11 (a) What are the harmful ingredients in brick and explain them?
   (b) Enumerate the principal reasons for decaying timber.

12 (a) Discuss about bulk density and porosity of aggregate.
   (b) Describe in detail different types of mortars.

13 (a) Explain the classification of aggregate. Mention different tests for aggregates.
   (b) What is Ordinary Portland Cement? Give chemical composition of OPC.

14 (a) What is seasoning of timber? State the objects of seasoning.
   (b) Explain about the materials like Gypsum, Glass.

15 (a) Explain about distempering and painting.
   (b) Discuss briefly about various methods of manufacturing of Tiles.

16 (a) What are the requirements of good 'Form work'?
   (b) What is the object of pointing? Describe the operation of pointing regarding the
       preparation of surface and its application completely.

17 Write short notes on any two of the following:
   (a) Pugmill
   (b) Recycled materials
   (c) Types of reinforcement.

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# FACULTY OF ENGINEEERING
### B.E II / IV (EEE) I - Semester (Non-CBCS) (Backlog) Examination, March / April 2022
### Subject: Electrical Circuits - I

**Time: 3 Hours**                                                    **Max. Marks: 75**

### (Missing data, if any, may be suitably assumed)
### PART – A
**Note: Answer all questions.**                                    **(25 Marks)**

1. State Compensation Theorem
2. State Tellegen's Theorem
3. Define Bandwidth
4. Define Selectivity
5. In a two wattmeter method the readings of two wattmeters are 60KW & 30KW resp. Find power factor.
6. What is isomorphism?
7. Define Node and tree
8. Draw the vector diagram for RLC series circuit.
9. Write relationship between line and phase voltages and currents for star connection.
10. Define quality factor.

### PART – B
**Note: Answer any five questions.**                          **(5 x 10 = 50 Marks)**

11 a)  List advantages of 3 phase systems.
   b)  Derive relation between line and phase voltages and currents in star connection.

12 Draw the graph of the networks shown below.
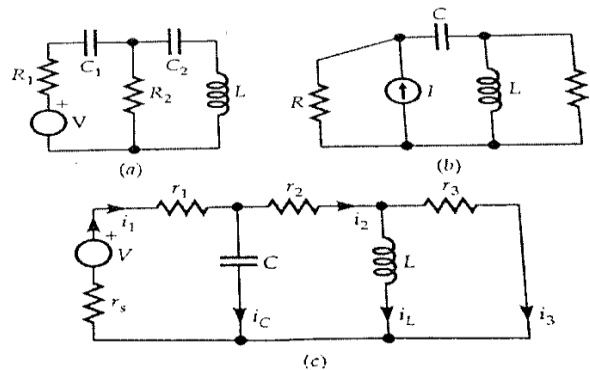


13 Derive expression for sinusoidal response of series RC circuit.

14 a)  Explain Millman's Theorem in detail
   b)  Explain Reciprocity Theorem in detail

15 Explain series connection of coupled coils.

16 Explain Star – Delta transformations.

17 A delta connected load has a parallel combination of resistance 5Ω and capacitive reactance – j5Ω in each phase. If a balanced 3 phase 400 Volts supply is applied between lines, find the phase currents and line currents and draw the phasor diagram.

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# FACULTY OF ENGINEERING

**B.E. II / IV (EIE) I - Semester (Non-CBCS) (Backlog Examination, March / April 2022**

**Subject: Network Theory**

**Time: 3 Hours**                                        **Max. Marks: 75**

**(Missing data, if any, may be suitably assumed)**

## PART – A

**Note: Answer all questions.**                              **(25 Marks)**

1. Define Selectivity & Bandwidth
2. State Maximum power Transfer Theorem
3. Write relationship between line and phase voltage and currents for star connection.
4. Define power factor
5. Define Impulse and Step signal
6. Draw the vector diagram for RC series circuit
7. Draw the vector diagram for RLC series circuit
8. Write generalized expression for transmission parameters.
9. Write generalized expression for Z parameters
10. What is balanced and unbalanced load?

## PART – B

**Note: Answer any five questions.**                         **(5 x 10 = 50 Marks)**

11. Find v by mesh method such that the current through 5 volts source is zero.
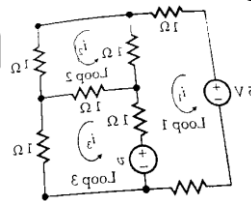


12. Derive the expression for sinusoidal response of parallel RL circuit.

13. a. Derive relation between line and phase voltages and currents in delta connection.
    b. List the advantages of 3 phase system over single phase system.

14 Explain Star – Delta transformation.

15 In the shown figure find the current through $10\Omega$ resistor using Thevenin's theorem.
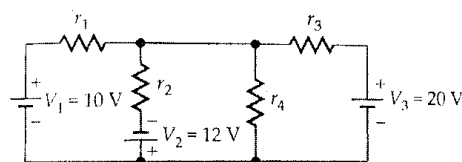


$[r_1 = 2\,\Omega, r_2 = 5\,\Omega, r_3 = 1\,\Omega, r_4 = 10\,\Omega]$

16 Explain Series & Parallel resonance in detail.

17 A three phase 4 wire 100 volts (L-L) system supplies a balanced star connected load having impedance of $10 \angle -30^o$ in each phase. Find line currents and draw the phasor diagram. How much current is flowing through the neutral?

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# FACULTY OF ENGINEERING
## B.E. II / IV (ECE) I - Semester (NON-CBCS) (Backlog) Examination, March / April 2022

### Subject: Basic Circuits Analysis

**Time: 3 Hours**                                                                              **Max. Marks: 75**

**(Missing data, if any, may be suitably assumed)**

### PART – A

**Note: Answer all questions.**                                                        **(25 Marks)**

1   State Max power theorem.
2   State Norton's theorem.
3   Write two properties of Positive Real function.
4   Define power factor.
5   What is pole-zero cancellation?
6   Draw the vector diagram for RC series circuit.
7   Draw the vector diagram for RLC parallel circuit.
8   What is Cut set matrix?
9   What is Tie set matrix?
10  Define Bandwidth.

### PART – B

**Note: Answer any five questions.**                                          **(5 x 10 = 50 Marks)**

11 Determine the node voltages and currents through the resistors using mesh method for the given network.
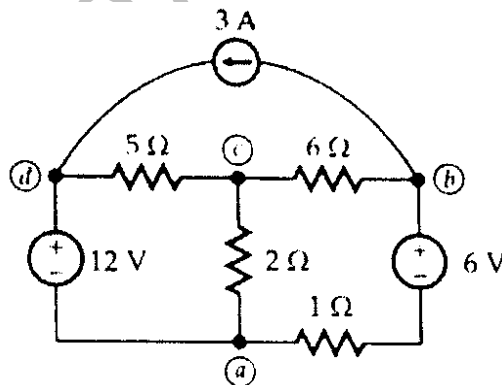


12 Derive expression for sinusoidal response of series RL circuit.

13 (a) Derive g & h parameters.
   (b) Write properties of Tree in a graph.

14 (a) Write properties of Tree in a graph.
   (b) Explain terminology used in Network graphs.

..2

15  In the figure shown find the current through 10 resistor using Thevenin's theorem.



$$[r_1 = 2\,\Omega, r_2 = 5\,\Omega, r_3 = 1\,\Omega, r_4 = 10\,\Omega]$$
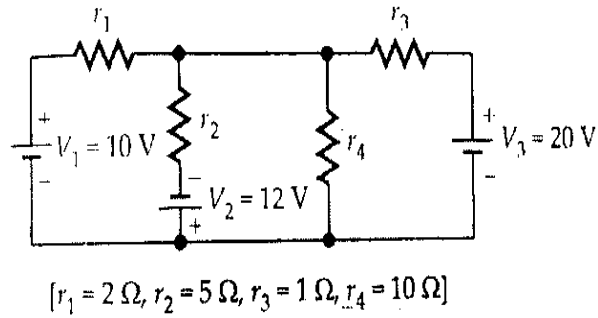
16  Explain Series & Parallel resonance in detail.

17  Derive EMF equation of transformer and also explain its construction and working.

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# FACULTY OF ENGINEERING
## B.E. II / IV (MECH/PROD/AE) I Semester (NON-CBCS) (Backlog) Examination, March / April 2022
### Subject: Metallurgy and Material Science

Time: 3 Hours Max. Marks: 75
### (Missing data, if any, may be suitably assumed)
## PART – A
**Note: Answer all questions.** **(25 Marks)**

1 What is the significance of a slip system?
2 Define the term "Fracture". List various types of fractures.
3 Draw the creep curve and show the different stages of creep on the creep curve.
4 Explain cumulative fatigue theory.
5 What is Bauchinger effect?
6 Write the methods of production of pig iron.
7 What is full annealing?
8 Sketch the microstructure of Grey Cast Iron.
9 Does ceramic melt? What are the applications of ceramics?
10 What is the rule of mixtures for composites?

## PART – B
**Note: Answer any five questions.** **(5 x 10 = 50 Marks)**

11 a) What are the point defects found in solid materials? Explain with suitable Sketches.
 b) Explain the effect of Hall-Fetch equation on mechanical properties of materials.

12 a) What is low cycle fatigue? Explain the method to estimate the fatigue damage in metals.
 b) Discuss low temperature creep and its utility in engineering design.

13 a) Draw Iron – Iron carbide equilibrium diagram and label all points, lines and areas of significance.
 b) What is age hardening? Describe different steps in age hardening.

14 a) Write procedure for construction of TTT curve and with an example interpret the curve.
 b) Explain the various types of stainless steels in detail.

15 a) Sketch a blast furnace. Describe its construction and working.

16 a) What is critical resolved shear stress? Explain.
 b) Write the applications of diffusion theory in mechanical engineering.

17 Write short notes on:
 (a) Stress Rupture curve
 (b) Surface heat treatment

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# FACULTY OF ENGINEERING
### B.E. II / IV (CSE) I - Semester (NON-CBCS) (Backlog) Examination, March / April 2022

**Subject: Discrete Structures**

Time: 3 hours                                                                                      Max. Marks: 75

### (Missing data, if any, may be suitably assumed)
### PART – A

**Note: Answer all questions.**                                                         **(25 Marks)**

1  Define the Rule of Universal Generalization
2  Obtain contra positive and inverse for the statement: If you have exam then you must work hard
3  Define Tautology and Contradiction
4  What is Asymmetric relation? Give example.
5  Define POSET
6  Find the co=efficient of $x^5$ in $(1-2x)^8$?
7  Define Graph coloring
8  What is Automorphism?.
9  Find the rook polynomial for shaded board?
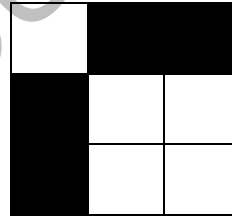
10 Draw the complement graph for $K_3$

### PART – B

**Note: Answer any five questions.**                                            **(5 x 10 = 50 Marks)**

11      Prove the validity of the argument

$$\forall x\big[\,p(x)\vee a(x)\big]$$

$$\forall x\big[\Box\ p(x)\wedge q(x)\big]\rightarrow r\left(x\right)$$

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$$\because \forall x\big[\Box\ r(x)\rightarrow p(x)\big]$$

12 a) Explain about glb, lub and Lattice
   b) A = {2, 3, 6, 12, 24, 36, 72} R:{(x,y) / x,y ε A, x divides y} write the partial order and draw the hasse diagram for R and compute lower bounds, upper bounds, greatest lower bound, least upper bound for {2, 12, 24}.

13 Solve $D(k) – 8D(k-1)+16D(k-2)=0$ where $D(2)=16$, $D(3)=80$?

14 Solve recurrence $a_{n+2}-4a_{n+1}+3a_n=-200, n>=0, a_0=3000, a_1=3300$ relation

15 State and prove Lagrange's theorem with an example.

..2

16 Explain Ring and Cosets with suitable example?

17 a)  Find the dual of the graph shown
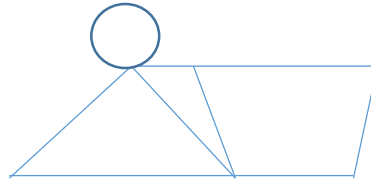


b) Prove that intersection of two sub-monoids is a monoid

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# FACULTY OF ENGINEERING
### B.E. II / IV (I.T.) I - Semester (NON-CBCS) (Backlog) Examination, March / April 2022
### Subject: Digital Electronics and Logic Design

Time: 3 hours                                                                    Max. Marks: 75
### (Missing data, if any, may be suitably assumed)
## PART – A
**Note: Answer all questions.**                                          **(25 Marks)**

1  Use algebraic manipulation to find the minimum sum products expression for the function.
2  Define synthesis and analysis of a logic functions.
3  Write VHDL code for full adder.
4  Define PLA and draw its general structure.
5  Draw basic SR Latch using NAND gates.
6  Differentiate between synchronous and asynchronous counters.
7  List the elements of ASM chart and show their symbols.
8  Define: (i) equivalent states (ii) partition with respect to a finite state machine
9  Differentiate between static and dynamic hazard.
10 Write the basic steps for the synthesis of asynchronous circuits.

## PART – B
**Note: Answer any five questions.**                                 **(5 x 10 = 50 Marks)**

11 (a) Write VHDL code to describe the following functions.
   (b) Derive a minimum cost circuit that implements the function
      $f(x_1, x_2, x_3, x_4) = \Sigma m(0, 2, 4, 6, 7, 9) + D(10, 11)$

12 (a) With a neat diagram explain the features of FPGA.
   (b) Draw a PLA structure to implement the function $f(x_1, x_2, x_3) = \Sigma m(1, 2, 4, 7)$.

13 (a) Design a 3-bit asynchronous up counter using T flip-flops.
   (b) Describe master slave D Flip-flop with timing diagram.

14 (a) Derive the state diagram and obtain the state table for a Melay FSM to detectthe sequence 1111.
   (b) Obtain a state diagram and state table for a melay type modulo-5 counter which counts the sequence 0, 1, 2, 3, 4, 0, 1,….. .

15 (a) Obtain the state diagram, flow table and excitation tables for a modulo-4 counter.
   (b) Find a hazard-free minimum-cost POS implementation of the function
      $f(x_1, x_2, x_3, x_4) = \prod M(0, 2, 3, 7, 10) + D(5, 3, 15)$

16 (a) With a neat diagram explain the development process of digital hardware.
   (b) Implement a 4 to 16 decoder using 2 to 4 decoder.

17 Write short notes on:
   (a) State minimization in asynchronous circuits
   (b) Conversion from JK FF to D FF
   (c) ASM chart of a serial adder

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# FACULTY OF ENGINEERING
## B.E (Civil) III - Semester (CBCS) (Backlog) Examination, March / April 2022

### Subject: Engineering Geology

**Time: 3 Hours**                      **Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**

## PART – A

**Note**: **Answer all questions**.             **(10 x 2 = 20 Marks)**

1  Discuss the types of metamorphic rocks.

2  Describe causes of folding.

3  How Igneous Rocks can be classified?

4  What is meant by rock cycle?

5  Differentiate between Gneiss and Schist.

6  Describe briefly the layers of interior of earth.

7  Define Geomorphology.

8  How landslides can be prevented?

9  Differentiate between texture and structure of the rock.

10 What is the influence of geology for stability and safety of reservoirs?

## PART – B

**Note**: **Answer any five questions**.          **(5 x 10 = 50 Marks)**

11. (a) Explain the textures of Igneous rocks with sketches.
    (b) How is geology related to engineering? Discuss the importance of geology in the field of Civil Engineering.

12. (a) With a neat diagram, describe different parts of a fault.
    (b) Write in detail the causes and effects of folding.

13. (a) Define ground water and hydrological cycle. Also explain aquifers and its types.
    (b) Explain Earthquake magnitude, Earthquake Intensity and Earthquake focus.

14. (a) Give physical properties of granite and limestone.
    (b) What are the purposes of dams? Explain.

15. (a) Discuss the influence of structural attitudes of sedimentary rocks on dam stability.
    (b) Describe the importance of Electrical Resistivity studies in civil engineering.

16. (a) Explain the association of geological structures for successful tunneling.
    (b) Explain the construction of building in earthquake prone areas

17. Write notes on any **TWO** of the following:
    (a) Endlap ad sidelap in aerial photography
    (b) Ground water exploration
    (c) Stand up time of tunnels

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# FACULTY OF ENGINEERING
### B.E. (EEE/EIE) III - Semester (CBCS) (Backlog) Examination, March / April 2022

### Subject: Prime Movers and Pumps

**Time: 3 Hours**                                                 **Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**

### PART – A

**Note: Answer all questions.**                                  **(10 x 2 = 20 Marks)**

1    What are different types of turbine?
2    What is dimensionless and state its significance?
3    Differentiate between laminar flow and turbulent flow.
4    What do you understand by dryness fraction?
5    Write the functions of different types of boilers.
6    Define cavitation and state its effect ton performance of pump.
7    Classify different types of gas turbines.
8    What are the uses of air vessel?
9    Define Newtonian and non-Newtonian fluids.
10 What is the need of draft tube? Mention different types of draft tubes.
11 What is need of priming in centrifugal pump?

### PART – B

**Note: Answer any five questions.**                          **(5 x 10 = 50 Marks)**

12 Explain Babcock and Wilcox boiler with neat sketch. State the principle of Babcock and Wilcox boiler and write its advantages and disadvantages.

13 (a) Discuss in detail boiler mountings and accessories.
   (b) Explain unit quantities of hydraulic turbine.

14 (a) Derive and explain Bernoulli's equation and mention its application.
   (b) Differentiate between Impulse and reaction turbine.

15 (a) Explain in detail constant volume combustion gas turbine plants.
   (b) Explain pressure compounding and pressure-velocity compounding with neat sketch.

16 (a) Explain in detail Work done and power required by reciprocating pump without air vessels.
   (b) Explain characteristic curves of hydraulic turbine.

17 (a) With the help of a neat sketch explain Francis turbine in detail.
   (b) What are the advantages, disadvantages and uses of pelton turbine?

18 (a) Classify and explain working of centrifugal pumps.
   (b) Write Euler's equation of motion along a stream line.

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# FACULTY OF ENGINEERING
## B.E. (ECE) III - Semester (CBCS) (Backlog) Examination, March / April 2022

### Subject: Electronic Devices

**Time: 3 Hours**                                                    **Max. Marks: 70**
### (Missing data, if any, may be suitably assumed)
### PART – A
**Note: Answer all questions.**                          **(10 x 2 = 20 Marks)**

1   What is Zener diode used for?
2   What is pn junction diode and explain its working?
3   What are the types of rectifiers?
4   What is varactor diode and its application?
5   What is transistor and its types?
6   Draw input and output characteristics in CB configuration.
7   Draw the characteristics of UJT.
8   What is DIAC and why it is used?
9   Draw V-I characteristics of JFET.
10 How is a MOSFET used as a switch?

### PART – B
**Note: Answer any five questions.**                     **(5 x 10 = 50 Marks)**

11 (a) Explain the working of zenerdiode as voltage regulator.
   (b) Derive the expression for diffusion capacitance of a diode.

12 (a) With neat diagram explain the construction, working characteristics of UJT.
       Give its equivalent circuit.
   (b) Explain in detail about TRIAC & DIAC.

13 (a) Explain in detail about FET as an amplifier and switch.
   (b) What is base width modulation and what are its consequences?

14 Draw the circuit diagram and explain the operation of full wave rectifier using center
   tap transformer and using bridge rectifier without center tap transformer. Obtain
   the expression for peak inverse voltages of both.

15 (a) Explain the working of NPN transistor.
   (b) Write the differences between CB, CE and CC Amplifier Configurations.

16 (a) Explain the JFET Small signal Model.
   (b) Explain the MOSFET characteristics in enhancement mode.

17 Write short notes on:
   (a) LED
   (b) Thermal breakdown in transistor
   (c) SCR.

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# FACULTY OF ENGINEERING

**B.E. (MECH/PROD) III Semester (CBCS) (Backlog) Examination, March / April 2022**

## Subject: Engineering Thermodynamics

**Time: 3 hours**                                           **Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**
## PART – A

**Note: Answer all questions.**                           **(10 x 2 = 20 Marks)**

1   Define Microscopic and Macroscopic approach.
2   Define system, surroundings and boundary.
3   State first law of thermodynamics and write its corollaries.
4   Explain isochoric and isobaric process.
5   Define Clausius statement of II law of thermodynamics.
6   Define heat pump, refrigetor and heat engine.
7   What is meant by a pure substance?
8   Discuss the terms saturation temperature and saturation pressure?
9   Explain Dalton's law of partial pressures.
10  Sketch P-V & T-S diagrams ofm Rankine cycle and name the processes.

## PART – B

**Note: Answer any five questions.**                       **(5 x 10 = 50 Marks)**

11 a)  Explain thermal equilibrium.
   b)  A new temperature scale in degrees N is designed with the freezing point $100^0$ N and the boiling point at $400^0$ N. Establish correlation between degree Celsius and degrees N. what would be the absolute temperature at $^0$ N.

12 a)  Write down SFEE and simplify for a boiler and a compressor.
   b)  Prove that for a constant pressure process, the heat transfer is equal to change in enthalpy.

13 a)  Explain the principle of increase of entropy.
   b)  A reversible heat engine receives heat from a reservoir at $700^0$C and rejects at temperature $T_2$ $^0$C. a second reversible engine receives heat rejected by the first engine and rejects to a sink at $37^0$C. calculate $T_2$ for equal work output of both the engines. Also calculate efficiency of each engine?

14 a)  Derive first and third Maxwells relations.
   b)  What is pure substance? Can air be treated as a pure substance?

**..2**

15 a) The stroke and cylinder diameter of a compression ignition engine are 250 mm and 150 mm respectively. If the clearance volume is 0.0004 m3 and fuel injection takes place at constant pressure for 5 per cent of the stroke determine

the efficiency of the engine. Assume the engine working on the diesel cycle.

   b) Explain dual combustion cycle with P-V and T-S diagrams.

16 a) Derive claperyon equation.
   b) Show that violation of Kelvin plank statement leads to violation of Clausius statement and vice versa.

17 a) Explain available and unavailable energy.
   b) Define thermometry and write a short note on temperature scales.

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# FACULTY OF ENGINEERING
## B.E. II/IV (A.E) III Semester (CBCS) (Backlog) Examination, March / April 2022

### Subject: Automotive Electrical and Electronics Engineering

**Time: 3 Hours**                                                    **Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**
### PART – A
**Note: Answer all questions.**                        **(10 x 2 = 20 Marks)**

1. What is meant by rating of a battery? Explain?
2. Explain about LED lighting system in an automobile?
3. Explain the principle of starter motor in automobile?
4. What are the important parameters that could be controlled in an engine?
5. How direct current is generated in an automobile?
6. Explain the importance of bridge rectifier?
7. Explain the purpose of regulator?
8. What are the requirements of electronic onboard diagnostics system?
9. What is electromagnetic compatibility explain briefly?
10. What is microprocessor?

### PART – B
**Note: Answer any five questions.**                        **(5 x 10 = 50 Marks)**

11. Explain in detail the process of testing and trouble diagnosis of lead –acid batteries.

12. Describe the starter motor construction and operation and why there is need of starting system

13. With a neat diagram, explain the alternation regulation system?

14. Explain in detail about automotive electromagnetic interference?

15. (a) What is a sensor explain its role in controlling speed ad throttle position?

    (b) Discuss the function of solenoid in an automobile?

16. Describe the electrical circuit of head light and side lights of an automobile with the help of neat diagram?

17. Explain in detail about electronic engine management system?

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# FACULTY OF ENGINEERING
## B.E. (CSE) III - Semester (CBCS) (Backlog) Examination, March / April 2022

### Subject: Data Structures

Time: 3 hours                                                               Max. Marks: 70

### (Missing data, if any, may be suitably assumed)

## PART – A

**Note: Answer all questions.**                                  **(10 x 2 = 20 Marks)**
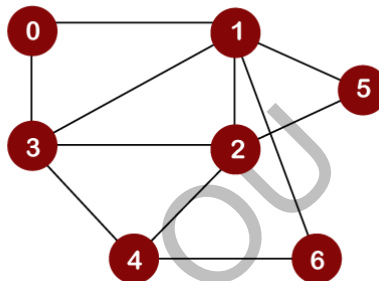
1   What is asymptotic notation?
2   Explain LL and LR rotation to balance the AVL tree with an example.
3   Which sort shows the best average behavior?
4   Sort the following set of numbers using Bubble Sort Technique.
       25, 67, 53, 11, 89, 57, 75, 33
5   How are individual elements accessed in an array?
6   What are the disadvantages of Recursion?
7   Compare and contrast DFS and BFS.
8   What are the benefits of doubly linked list over singly linked list?
9   Define the terms Sub-Graph and Cycle of a Graph.
10  Define Hashing. What are the advantages of hashing?

## PART – B

**Note: Answer any five questions.**                              **(5 x 10 = 50 Marks)**

11  (a)Explain Performance Analysis of an Algorithm.
     (b)Illustrate the deletion operation for linked list writing a suitable program.

12  (a)Explain in detail about the operation of queue with a suitable example.
     (b) Evaluate the following prefix expression "++26 + - 1324".

13  (a)Write an algorithm to delete a node from a binary search tree.
     (b)Create AVL tree by inserting the following numbers in the order in which they
        are given 40, 30, 20, 60, 50, 80, 15, 28, 25.

14  (a)Explain the Krusal's algorithm.
     (b)Explain the representation of graph using adjacency matrix and
        adjacency list.

15  Write down the Quick sort algorithm and give its worst case, best case
    and average case analysis.

16  Sort the following array using insertion sort
    25, 30, 66, 99, 54, 28, 13, 58

17  Write short notes on any **two** of the following:
    (a)   Heap Sort
    (b)   Doubly linked list
    (c)   Sparse Matrix

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# FACULTY OF ENGINEERING
### B.E. (IT) III - Semester (CBCS) (Backlog) Examination, March / April 2022

**Subject: Data Structures**

**Time: 3 Hours**                                                   **Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**

## PART – A

**Note: Answer all questions.**                          **(10 x 2 = 20 Marks)**

1. Differentiate performance analysis and performance measurement.
2. What is a Sparse Matrix? Explain the sparse matrix representation.
3. Define Abstract data type. Write ADT for Stack.
4. Convert X/Y-Z*W+V to prefix and postfix expressions.
5. Explain differences between linear and linked representation of a stack.
6. Why hashing is needed? What are its advantages?
7. Write BFS and DFS for the given graph.



8. What is m-way search trees?
9. Explain the Representation of Graphs with example.
10. Define splay tree.

## PART – B

**Note: Answer any five questions.**                     **(5 x 10 = 50 Marks)**

11. (a) Explain Various Asymptotic Notations with examples.
    (b) Write a C++ program for the implementation of Array ADT.

12. (a) Write a function to evaluate postfix expression.
    (b) Evaluate the postfix expression 231*+9- step by step using stack.

13. (a) Explain about Linked queue and its operations.
    (b) Explain about static hashing and Hash Functions.

14. (a) Construct a binary search tree for the given numbers
        12,45,65,89,30,25,10,32,55.
        Write inorder, preorder and postorder for the same.
    (b) Explain the rotations used in AVL Trees.

15. (a) What is Red black tree? Write its properties.

(b) What is Minimum cost spanning tree. Use Kruskal's Algorithm to find minimum cost spanning tree for the following graph.
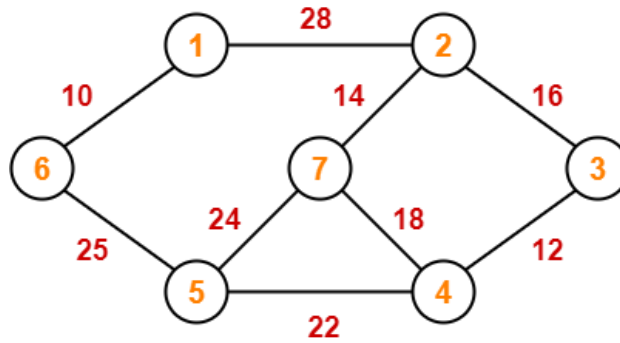


16. (a) What is Max Heap? Construct a max heap with the given numbers
1, 3, 5, 4, 6, 13, 10, 9, 8, 15, 17

(b) Write C++ function for quick sort .Trace the algorithm for the elements
10, 80, 30, 90, 40, 50.

17. Write short notes on
(a) Templates in C++
(b) Polynomial representation
(c) Threaded Binary Tree

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