

FACULTY OF ENGINEERING
B.E.2/4 (Civil) I – Semester (Backlog) Examination, December 2019

Subject: Building Materials & Construction

Time : 3 Hours

Max. Marks: 75

PART – A (25 Marks)

Note: Answer all questions from Part-A and any five Questions from Part-B

- 1) What are the uses of stone as a building material? (2)
- 2) What are the advantages of hollow building blocks? (2)
- 3) Name the various ingredients of cement and their percentage. (3)
- 4) What is bulking of sand? (2)
- 5) What are deformed steel bars and their advantages? (3)
- 6) Write about the importance of curing concrete. (2)
- 7) What are the advantages of using laminates? (3)
- 8) Differentiate between paints and varnish. (3)
- 9) Define an arch. (2)
- 10) What is formwork and scaffolding? (3)

PART – B (5 x 10 = 50 Marks)

11. a) With the help of neat sketches explain the methods of quarrying stone by Wedging and Use of Channeling Machine. (5)
- b) With the help of neat sketches explain two types of continuous brick burning kilns. (5)
12. a) Write about OPC, PPC and Blended Cements. (5)
- b) Classify sand based on its availability and size. (5)
13. a) Explain the various types of mortars generally used. (5)
- b) What are the precautions to be taken while mixing and transporting concrete? (5)
14. a) What are methods of artificial seasoning of timber? (5)
- b) What are the various components of paint and their purpose? (5)
15. a) Explain the procedure of laying Terrazzo flooring. (5)
- b) With the help of neat sketches explain the various methods of Pointing. (5)
16. a) With the help of a neat sketch explain the form work for a column. (5)
- b) With the help of a neat sketch explain the various parts of an arch. (5)
17. Write short notes on:
 - (i) Energy conservation measures and methods in buildings. (3)
 - (ii) Masons scaffolding. (4)
 - (iii) Ashlar arches. (3)

FACULTY OF ENGINEERING

B.E. 2/4 (EEE) I- Semester (Backlog) Examination, December 2019

Subject: Electrical Circuits - I

Time: 3 Hours

Max. Marks: 75

Note: Answer all questions from Part-A & answer any five questions from Part – B

PART – A (25 Marks)

1. Define the following
 - a) Node
 - b) Loop
 - c) Active element3M
2. Find the resistance R for the network shown in Fig. 1 2M

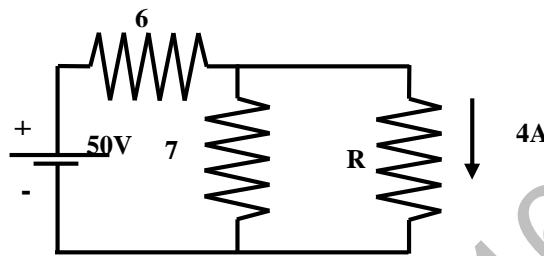


Fig.1

3. Represent the impedance, voltage and power triangles in an RC circuit, 3M
4. A voltage $V = 230 \sin 314t$ source is connected across a series RC branch whose resistance $R = 25\Omega$, $C = 25 \text{ F}$. Find the reactive power, power factor of the circuit. 2M
5. Show that if each branch of a delta circuit has an impedance of Z, then equivalent Wye network will have an impedance of $3Z$. 2M
6. Show that the power delivered in three balanced circuit is $P = \sqrt{3}V_L I_L \cos \phi$ 3M
7. Define the following
 - a) Oriented Graph
 - b) Incident Matrix2M
8. Represent the Thevenin's equivalent for the network shown in Fig.2 between terminals a and b. 3M

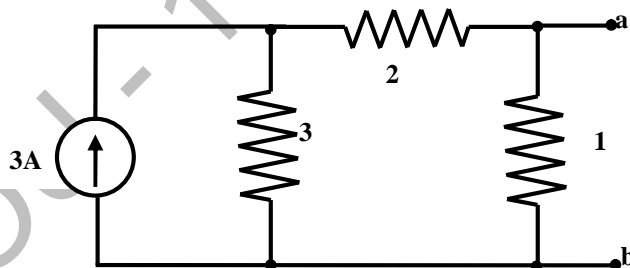


Fig.2

9. Show that in a series RLC circuit at resonance the current will be maximum. 3M
10. What is meant by self inductance and mutual inductance? 2M

PART – B (50 Marks)

11. a) With an example explain what are active and passive elements. 4M
- b) For the network shown in Fig.3 determine the power loss across 5Ω resistor by using Nodal analysis. 6M

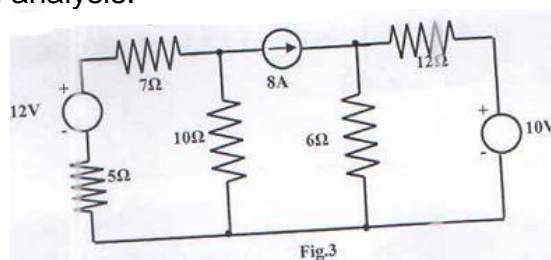


Fig.3

Contd...2..

-2-

12. a) Define the following

- (i) Average Value
- (ii) Frequency
- (iii) Form factor

3M

b) The power consumed in the inductive load shown in Fig.4 is 2.5 kW at 0.71 lagging power factor (pf). The input voltage is 230 V, 50 Hz. Find the value of the capacitor C, such that the resultant power factor of the input current is 0.866 lagging.

7M

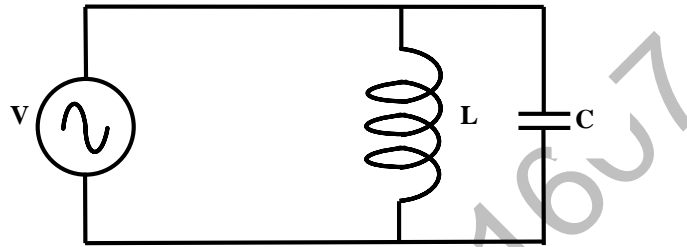


Fig.4

13. A balance load of $(16+12j)\Omega$ per phase, connected in star, is fed from a three phase, 230V supply. Find the line current, power factor, total power, reactive VA and VA. Draw the phasor diagram.

10M

14). a) For the network shown in Fig.5 formulate the cutset equations.

5M

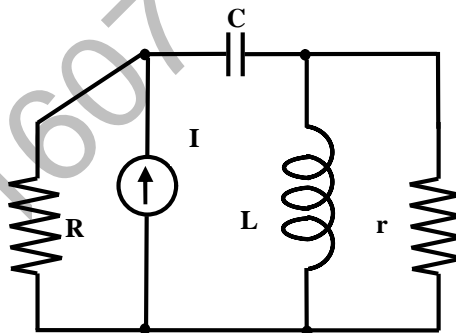


Fig. 5

b) State Millman's theorem. Find the current I in the circuit shown in Fig.6 by using Millman's theorem.

5M

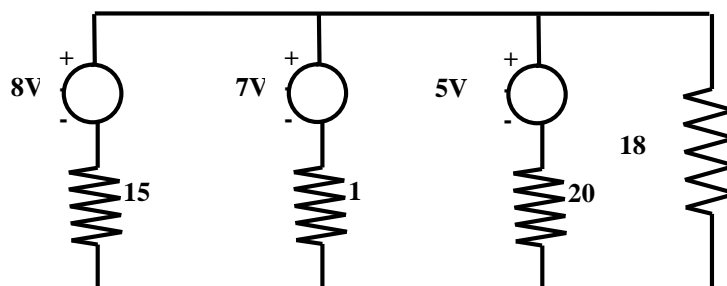


Fig.6

15. a) A constant voltage of frequency, 1MHz is applied to a lossy inductor (r in series with L), in series with a variable capacitor, C . The current drawn is maximum, When $C = 400$ pF; While current is reduced to $\frac{1}{\sqrt{2}}$ of the above value, when $C = 450$ pF. Find the values of r and L . Calculate also the quality factor of the coil, and the bandwidth. 6M
- b) What is coefficient of coupling? Derive the expression for coefficient of coupling. 4M
16. For the network shown in Fig.2, find the current flowing through 6Ω by using Super Position Theorem. 10M

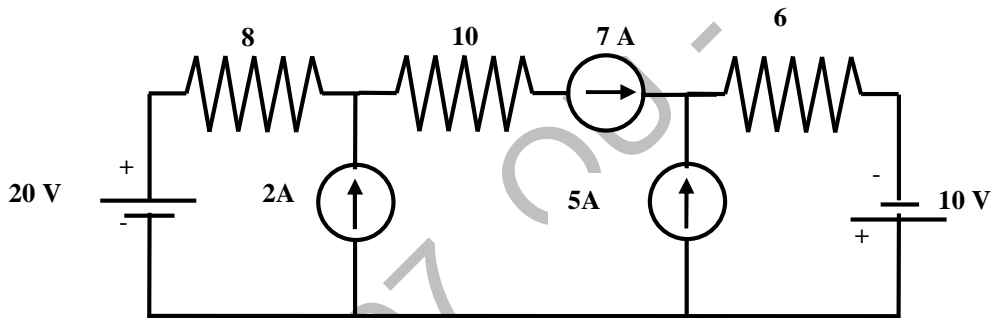


Fig.7

17. Draw the locus diagrams of a series R-L and R-C circuit and Explain. 10M

FACULTY OF ENGINEERING
B.E. 2/4 (EIE) I – Semester (Backlog) Examination, December 2019

Subject: Network Theory

Time: 3 Hours

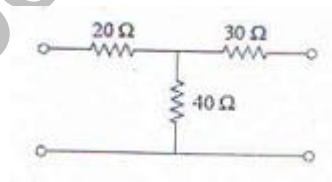
Max. Marks: 75

Note: Answer all questions from Part-A & answer any five questions from Part-B.

PART – A (25 Marks)

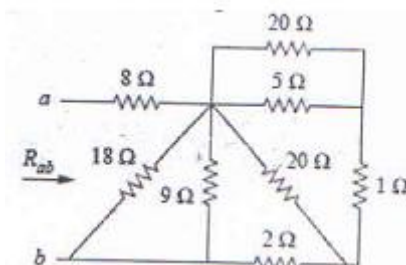
1. Write the equation for energy stored in Inductor and capacitor.
2. State Maximum Power transfer theorem
3. Define time domain analysis of Circuit.
4. Define series resonance and parallel resonance.
5. Find the amplitude, phase, period and frequency of the sinusoidal signal.

$$v(t) = 10\cos(50t + 20^\circ)$$
6. The voltage $v = 12\cos(60t + 45^\circ)$ is applied to a 0.1 H inductor. Find the steady-state current through the inductor.
7. Find Quality factor and Bandwidth $R=9\text{kohm}$ $L=0.3\text{mH}$ $C=8\text{ microF}$ in parallel RLC circuit.
8. What is dot convention?
9. Define two port Network.
10. Determine z_{12} for the circuit.



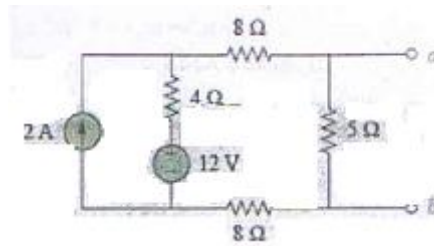
PART – B (50 Marks)

11. a) For the circuit in Fig. Find the R_{ab} equivalent.

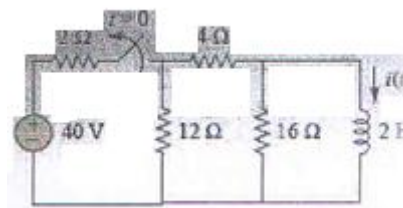


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b) Find the Norton equivalent of the circuit as shown in Fig.

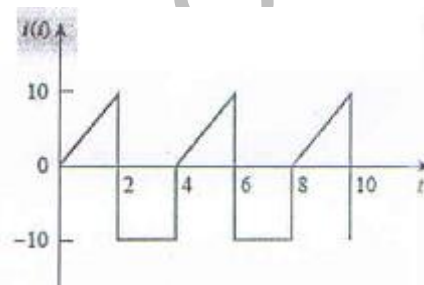


12. a) The switch has been closed for a long time. At $t=0$, the switch is opened. Calculate $i(t)$ for $t > 0$.



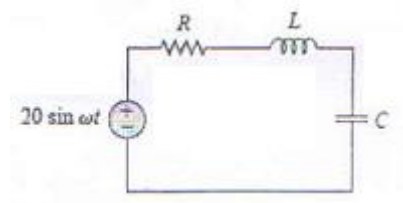
b) Derive the $v(t)$ for an RC circuit subjected to step input voltage.

13. a) Determine the rms value of the current waveform in Fig. If the current is passed through a 2 ohm resistor, find the average power absorbed by the resistor.



b) Derive the expression for energy stored in inductor and capacitor.

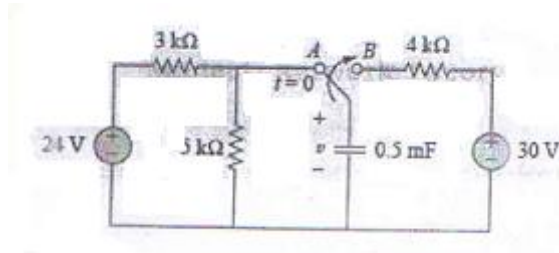
14. a) In the circuit of Fig. $R = 2 \text{ Ohm}$, $L = 1 \text{ mH}$ and $C = 0 \text{ micro F}$ Find
 (i) The resonant frequency and the half-power frequencies.
 (ii) Calculate the quality factor and bandwidth.
 (iii) Determine the amplitude of the current at Ω_0 , Ω_1 , Ω_2 .



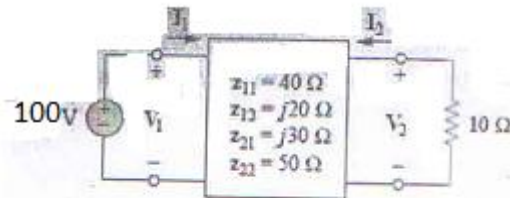
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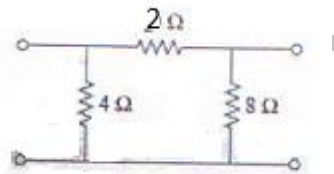
- b) The switch in fig. has been in position A for a long time. At $t = 0$, the switch moves B. Determine $v(t)$ for $t > 0$ and calculate its value at $t = 1\text{s}$ and 4s .



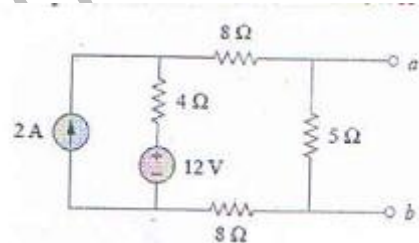
15. a) Find I_1 and I_2 of the circuit shown in the fig.



- b) Obtain the Y parameter for the II network shown in Fig.



16. a) Write short notes on Sinusoids and RMS value of periodic time function.
 b) Write short notes on Mutual Inductance and coefficient of Coupling.
17. a) Find the Thevenin equivalent of the circuit shown below.



- b) Write short notes on Network elements. Classification of each of them.

FACULTY OF ENGINEERING

B.E 2/4 (ECE) I-Semester (Backlog) Examination, December 2019

Subject : Basic Circuit Analysis

Time : 3 Hours

Max. Marks : 75

Note : Answer all Questions From Part-A, & Any Five Questions From Part-B.

Part-A (25 Marks)

1. State the voltage-current relationship equations for an inductor and a capacitor 2M
2. Define the following terms and give one example for each 3M
A. Chords or Links B. Cut-set C. Incidence matrix.
3. Distinguish between zero state response and zero input response in a transient circuit. 3M
4. In the initially relaxed circuit of figure (1) find V in the steady state. 2M

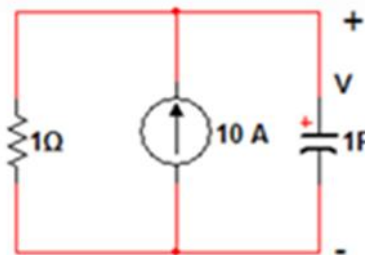


Figure-1

5. What is a power triangle. Explain all its components. 2M
6. Find the Impedance of the following circuit of figure (2) if the input AC is of frequency 100 r/Sec 3M

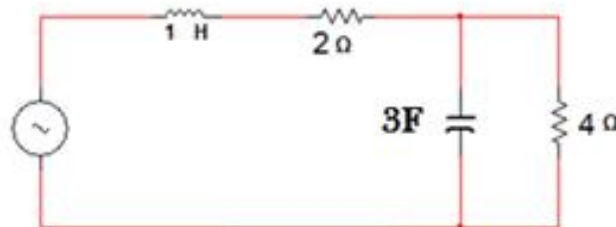


Figure-2

7. Explain the Reciprocity theorem with an example. 2M
8. Find the two hybrid parameters h_{11} and h_{21} for the two-port network of figure (3) 3M

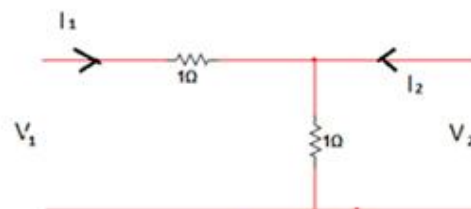


Figure-3

9. Draw the pole-zero plot of impedance for the circuit of figure (4) 3M

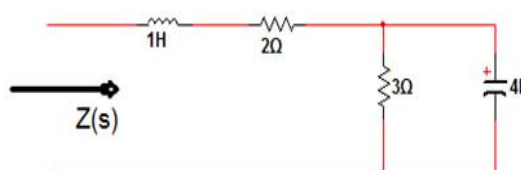


Figure-4

10. Define the band-width of a Parallel Resonant Circuit and give an expression for it. 2M

PART-B (50 Marks)

11. Find the current I in the circuit of figure 5 using superposition Theorem. 10M

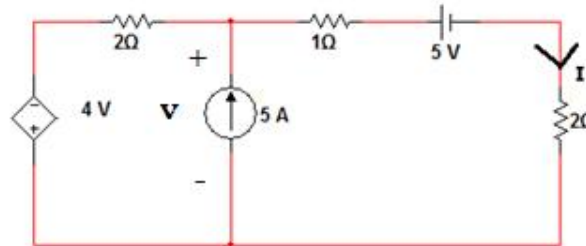


Figure-5

12 a) Draw the dual network of the network shown in figure 6. Verify the result. 4M

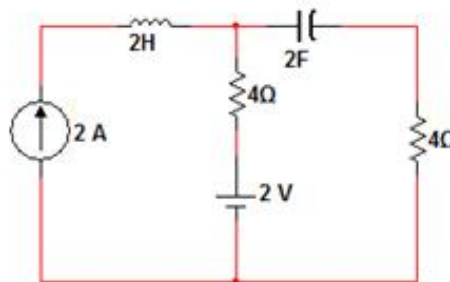


Figure-6

b). Find the voltage V in the circuit of figure 7 using tie set analysis. 6M

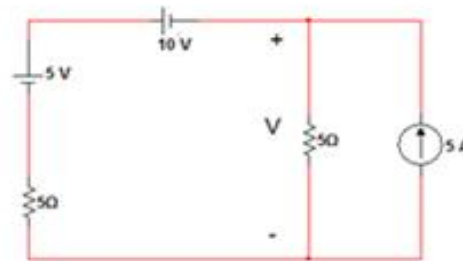


Figure-7

13 a. In the circuit of figure 8 find $V(t)$ for $t > 0$ Initially the Capacitor is not charged. 7M

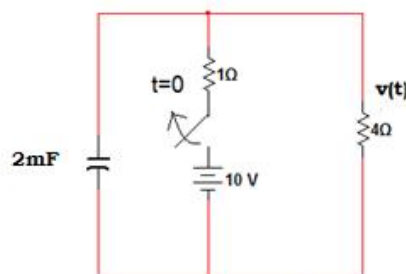


Figure-8

b. The current $i(t)$ in a source free RL Series circuit is $i(t) = 5e^{-5t}$. Find $i(t)$ at $t=2$ where τ is the time constant.

3M

...2

- 14 a) In the circuit of figure 9 find the power delivered to the load resistance of 5 using mesh analysis. 7M

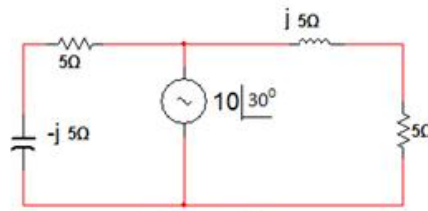


Figure-9

- b) In the circuit of figure9 find the complex power supplied by the AC source. 3M
15. Find the ABCD parameters of the Two-port network of figure.10 10M

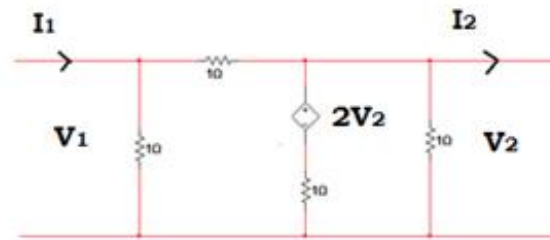


Figure-10

- 16 a. The current as a function of complex frequency s is given by $I(s) = \frac{5(s+2)}{(s^2+5s+4)}$. Find the current response $i(t)$ in time domain using Pole-Zero plot. 6M
- b. Find an expression for the quality factor of a series RLC resonant circuit. 4M
17. Write Technical notes on the following:
- Maximum power transfer theorem for ac circuits. 3M
 - Star-Delta transformation. 4M
 - Different types of damping in parallel RLC circuits. 3M

FACULTY OF ENGINEERING

B.E. 2/4 (M/P/A.E) I – Semester (Backlog) Examination, December 2019

Subject: Metallurgy and Material Science

Time: 3 hours

Max. Marks: 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1. State the differences between ductile fracture and brittle fracture.
2. What is the significance of Slip system?
3. Draw the structure of the fatigue fracture specimen and show the various regions on it.
4. Draw the S-N curve for ferrous and non ferrous metals.
5. What are the applications of Phase diagrams?
6. What are plain carbon steels and explain their classification?
7. What is Full annealing?
8. What are the characteristics of Cast iron?
9. What is the difference between acid and basic steel making?
10. Mention the application of power metallurgy.

PART – B (50 Marks)

11. (a) Classify crystals defects. Explain various types of dislocations.
(b) Discuss in detail the variation in properties and structure of material when a cold work material is heated to successively higher temperature.
12. (a) What is creep? Explain the three stages of creep with the help of a neat diagram.
(b) Explain various factors to be considered for improving the fatigue life of material.
13. (a) Explain the malleabilizing treatment given to white cast iron with a neat sketch?
(b) Explain peritectic, eutectic and eutectoid reactions in the iron-carbon system.
14. (a) Describe the tempering process in detail.
(b) What is surface hardening? Explain in detail various surface hardening methods.
15. (a) Explain the production of steel using Bessemer converter.
(b) Discuss any one method of production of Aluminium.
16. (a) Explain the effect of important alloying elements on properties of steel.
(b) Sketch and explain the Electro Slag Refining Process.
17. Write short notes on the following:
 - (a) Bauchinger Effect.
 - (b) Low cycle Fatigue.
 - (c) Full Annealing.

FACULTY OF ENGINEERING

B.E 2/4 (CSE) I-Semester (Backlog) Examination, December 2019

Subject: Discrete Structures

Time: 3 Hours

Max. Marks: 75

Note: Answer All Questions From Part-A, & Any Five Questions From Part-B.

Part – A (25Marks)

- | | |
|--|---|
| 1 Define LATTICE | 3 |
| 2 Give an example for Symmetric and Anti Symmetric relation | 3 |
| 3 Define semi groups with examples. | 3 |
| 4 What is meant by universal quantifier | 2 |
| 5 Define Algebraic structure | 2 |
| 6 Define chromatic number | 2 |
| 7 Difference between bipartite and complete bipartite graphs | 3 |
| 8 Explain In Degree and Out Degree in diagraph | 2 |
| 9 What is principle of duality? | 2 |
| 10 What is first order linear homogeneous recurrence relation? | 3 |

Part – B (50Marks)

- | | |
|---|----|
| 11 a) Define Tautology and verify that given statement is tautology
$(p \rightarrow q) \wedge (q \rightarrow r) \rightarrow (p \rightarrow r)$ | 5 |
| b) Simplify $p \vee q \vee (\sim p \wedge \sim q \wedge r)$ | 5 |
| 12. a) Consider the functions f and g defined by $f(x)=x^3$, $g(x)=x^2+1$, $x \in \mathbb{R}$
Find $g \circ f$, $f \circ g$, f^2 and g^2 . | 5 |
| b) Prove that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ where A, B, C are non empty sets | 5 |
| 13. a) Find the coefficient of x^{96} in $\frac{(1-x^{35})^4}{(1-x)}$ | 6 |
| b) In how many ways can 4 letter in ENGINE be arranged? | 4 |
| 14. a) Determine the coefficient of x^8 in $1/(x-3)(x-2)^2$ | 4 |
| b) Solve recurrence relation $F_n=3F_{n-1}+10F_{n-2}+7.5^n$ where $F_0=4$ and $F_1=3$ | 6 |
| 15. a) What is an algebraic system? Write the properties of an algebraic system | 5 |
| b) Prove that $(\mathbb{Q}^+, *)$ where $*$ is a binary operation defined by $a * b = ab/5$ is a group. | 5 |
| 16. Explain the Prims algorithm with suitable example | 10 |
| 17. Write short notes on: | 10 |
| (i) Hamiltonian Graph | |
| (ii) Hasse Diagram | |
| (iii) Homomorphism | |

FACULTY OF ENGINEERING**B.E. 2/4(I.T.) I Semester (Backlog) Examination, December 2019****Subject: Digital Electronics and Logic Design****Time: 3 hours****Max Marks: 75****Note: Answer all questions from Part-A and any five questions from Part-B****PART – A (25 Marks)**

- 1 Explain the universal gates in detail. (2)
- 2 Convert $(247)_{10}$ & $(3287.5100098)_{10}$ into octal. (2)
- 3 Explain behavior of Asynchronous Sequential Circuits (2)
- 4 Differentiate between PAL and PLA (3)
- 5 What is a Prime Implicant? (2)
- 6 Design a Full Adder Circuit. (3)
- 7 Define VHDL code for 4 x 1 multiplexer. (3)
- 8 Explain in detail the elements of ASM charts. (3)
- 9 Write the VHDL code for D Flip flop (3)
- 10 Explain dynamic hazard with example (2)

PART – B (50 Marks)

11. a) With the neat diagram explain general structure of FPGA. (5)
- b) Write VHDL code for the following functions (5)

$$f_1 = x_1x_3' + x_2x_3' + x_3'x_4' + x_1x_2 + x_1x_4'$$

$$f_2 = (x_1 + x_3') (x_1 + x_2 + x_4') (x_2 + x_3' + x_4')$$
12. Explain FSM as an Arbiter circuit. (10)
13. (a) Explain about state assignment problem in detail. (5)
- (b) Write about Formal model of synchronous sequential circuits. (5)
14. (a) Explain Shannon's expansion theorem. (5)
- (b) CAD tools. (5)
15. (a) With a neat diagram explain the negative type Master Slave Edge triggered D Flip Flop. (7)
- (b) Design a 3 – bit Down Counter. (3)
16. Explain in detail about Analysis, Synthesis, State Reduction of Asynchronous sequential circuits. (10)
17. Write short notes on (10)
 - (a) Significance of Hazards
 - (b) Clock Synchronization

FACULTY OF ENGINEERING

B. E. (AICTE) (Civil) III – Semester (Main) Examination, December 2019

Subject: Industrial Psychology

Time: 3 hours

Max. Marks: 70

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (10 x 2 = 20 Marks)

1. Name main departments of Industry.
2. What are the characteristics of Group Behavior?
3. How incentive act as motivators?
4. List different effects of advertising.
5. How illumination effects the working environment?
6. What role personal factors play in optimizing the work environment?
7. What are the symptoms of boredom?
8. How skills and abilities effects job performance?
9. How performance can be improved by good human relations?
10. How Morale effect the performance of employee?

PART – B (5 x 10 = 50 Marks)

11. (a) Discuss in detail different Organizational theories.
(b) What role does authority and power plays in organizational effectiveness?
12. (a) Describe in detail Herzberg's Motivation Hygiene Theory.
(b) Discuss how personal factors affect the performance of an employee.
13. (a) What is Consumer behavior and how it is important for an organization?
(b) Discuss the nature and scope of engineering psychology and its application to industry.
14. (a) What are the different factors effecting efficiency at work place?
(b) How to determine consumer preference and give Consumer Preference example?
15. Explain different types of work methods. Describe work curve and its characteristics.
16. (a) What is Job Design in HRM? Discuss work space and arrangement in Organization.
(b) What are the Merits and Demerits of Work Simplification?
17. Discuss how the working environment is effected by
(a) Noise (b) Illumination (c) Atmospheric conditions.

FACULTY OF ENGINEERING
BE III – Semester (AICTE) (ECE)(Main) Examination, December 2019
Subject: Finance & Accounting

Time: 3 Hours

Max. Marks: 70

Note: Answer all questions from Part-A & Any five questions from Part-B

PART – A (20 Marks)

- 1 Explain Book-Keeping Accounting.
- 2 What is Journal? Explain the purpose.
- 3 How Interest on capital treated in final Accounts given in the adjustments?
- 4 Explain Business Entity concept.
- 5 What is money Market? Explain.
- 6 Define Primary market.
- 7 Explain about Payback Period
- 8 Write about Internal Rate of Return.
- 9 Explain Debtor's turnover Ratio.
- 10 Explain Interest coverage Ratio.

PART – B (50 Marks)

11. a) Write any three accounting conventions. 5M
 b) Write Journal Entries for the following transactions: 5M
 - 1-1-2010 Vinay Commercial business with capital of Rs.1,00,000
 - 2-1-2010 Purchase goods for each cash Rs. 10,000.
 - 3-1-2010 sold goods for cash Rs. 5,000.
 - 4-1-2010 Deposited cash in bank Rs. 10,000
 - 5-1-2010 Withdrawn Cash from bank for personal use Rs.2,000.
12. Prepare Accounts from the following Trial Balance for the year ending 31-3-2012. 10

Debit Balance	Rs.	Credit Balance	Rs.
Land and Buildings	9,00,000	Capital Account	12,00,000
Advertisement Expenses	11,00,000	Creditors	30,000
Machinery	8,25,000	Bills Payables	70,000
Carriage	5,000	Sales	4,80,000
Furniture	72,000	Loan	3,00,000
Interest	3,000		
Salaries	42,000		
Trade Expenses	12,000		
Wages	18,000		
Opening Stock	33,000		
Bad Debts	2,000		
Debtors	15,000		
Cash	25,000		
Cash at bank	56,000		
Purchases	61,000		
	20,80,000		20,80,000

Adjustments:

- 1) Closing stock Rs.12,000
- 2) Outstanding wages Rs.4,000
- 3) Provide Depreciation on Machinery @ 10%
- 4) Prepaid salaries Rs.2,000

13. a) Draw a structure of Indian Financial system. 5M
 b) Role of Financial Intermediaries Explain. 5M

14. You are required to prepare Net present Value (NPV) from the following information. A machine costing Rs.4,00,000 Rate of return is 10%, Profit after tax for five years as follows. 10M

Year	1	2	3	4	5
Rupees	1,20,000	1,60,000	2,00,000	1,20,000	80,000

15. Given that current Ratio is 1.75, liquid Ratio is 1.25, net working Capital is Rs.1,50,000 Calculate. 10M
 a) current assets
 b) Current liabilities
 c) Liquid assets and
 d) Stock.

16. Prepare a Bank reconciliation statement as on 31-12-2009. 10 M
 a) Cash book balance as on 31-12-2009 Rs.1,75,000
 b) Cheque amounting to Rs.80,000 issued were not presented for payment before closing date.
 c) A Cheque of Rs.60,000 deposited on 25-12-2009 was returned and dishonoured.
 d) Interest on investments Rs.4,000 was collected and credited pass book.
 e) Bank charges debited in passbook only Rs.6.

17. Prepare an Analytical Petty Cash book. 10M
 1-4-2013 Received cash from the head chashier Rs.200
 5-4-2013 Purchase Postage stamps Rs.10.
 7-4-2013 Paid stationary Rs.24.
 8-4-2013 Paid for charge Rs. 8
 15-4-2013 Paid for taxi hire Rs.15
 20-4-2013 paid office Expenses Rs.22.
 25-4-2013 Paid to Kamal Rs.18.
 30-4-2013 Sent telegram to Mumbai Rs.16.

FACULTY OF ENGINEERING**B. E. (CSE) (AICTE) III – Semester (Main) Examination, December 2019****Subject: Data Structures & Algorithm****Time: 3 hours****Max. Marks: 70****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (20 Marks)**

1. Write about Dynamic Memory Allocation in C++. 2
2. What is Time Complexity of an Algorithm? 2
3. What is Encapsulation in Object Oriented Design? 2
4. List the Common Operations on a Data Structure. 2
5. What is Enqueue, Dequeue, Peak operation? 2
6. How a Graph is represented using Data Structure? 2
7. Define Hashing and give its advantages. 2
8. List Access Modifiers in C++. 2
9. Represent the given polynomial $6x^4 - 2x^2 + 6x - 10$ by a linked list. 2
10. State the application of Stacks. 2

PART – B (50 Marks)

11. (a) Explain in detail Templates in C++. 5
- (b) Write a programme to explain Constructor and destructor in C++. 5
12. (a) Write the Stack ADT and its operations. 5
- (b) Write about Asymptotic Notations. Give example for each. 5
13. (a) Write a programme to implement Queue using Arrays. 5
- (b) Differentiate between DFS and BFS. 5
14. Explain in detail about Binary Tree and its Traversal Techniques. 10
15. (a) Write about Quick Sort and discuss its Time and Space Complexities. 5
- (b) Explain the complexity of Heap-sort, construct Min-Heap for the sequence
 10, 30, 5, 14, 45. 5
16. Explain in detail Single Linked list and its Algorithms for Traversing, Searching, insertion and deletion. 10
17. (a) Write short notes on Exception Handling. 3
- (b) Write about Selection Sort. 3
- (c) Write about time Complexity of Merge Sort and Quick sort. 4

FACULTY OF ENGINEERING

B. E. (Civil) (CBCS) III – Semester (Backlog) Examination, December 2019

Subject: Engineering Geology

Time: 3 hours

Max. Marks: 70

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (20 Marks)

1. How are Primary rocks are classified into three groups?
2. Draw a neat sketch of fault and label its parts.
3. Explain about soil profile with a neat sketch.
4. Define Aquifer & Aquifuge.
5. Define strike & Dip.
6. List out advantages of remote sensing.
7. List out the names of the Instruments used in resistivity survey & seismic survey.
8. Draw a neat diagram of a Dam, and Label its parts.
9. Explain about over break in tunnel.
10. Explain the term landslide.

PART – B (50 Marks)

11. Write about distinguish properties of Igneous rocks with neat sketches. (10)
12. (a) Write about hydrogeologic cycle with a neat sketch. (5)
(b) Write about weathering process. (5)
13. (a) Write about Folds & its classification. (5)
(b) State the principle & Methodology involved in electrical resistivity survey. (5)
14. (a) Explain in detail engineering consideration of Marine landform. (5)
(b) How do you determine the tensile strength of rocks in a laboratory? (5)
15. (a) Write about sitting of Reservoirs. (5)
(b) Explain the foundation geology of Nagarjuna Sagar dam. (5)
16. (a) Write about earthquake resistant structures. (5)
(b) Lining in Tunneling. (5)
17. Explain in detail about various important parameter for excavating a tunnel in hard rock. (10)

FACULTY OF ENGINEERING

B.E. III-Semester (CBCS) (EE/Inst.) (Backlog) Examination, December 2019

Subject: Prime Movers and Pumps

Time : 3 Hours

Max. Marks: 70

Note: Answer all questions from Part - A and answer any five questions from Part-B.

PART - A (20 Marks)

- 1 What is priming why it is necessary?
- 2 Distinguish between compressible flow and incompressible flow?
- 3 What is cavitation? What are the causes?
- 4 Define term unit power?
- 5 Define slip and percentage slip?
- 6 Define uniform and Non uniform flow?
- 7 Define term suction head and delivery head?
- 8 Differentiate between inward and outward radial turbine?
- 9 List the advantages of high pressure boilers?
- 10 How gas turbines are classified?

PART-B (50 Marks)

11. Derive Bernoulli's Equation from Euler's equation of motion and list its applications?
12. Explain the construction and working of Francis turbine with neat sketch? Draw inlet outlet velocity triangle figures?
13. What is an air vessel? Describe the function of air vessel used for reciprocating pumps with neat sketch?
14. Explain the construction and working of Babcock & Wilcox boiler with neat sketch?
15. Explain Pressure Compounding And Velocity Compounding of a Steam Turbine?
16. Differentiate between (state fine differences each)
 - a) Impulse and reaction turbine
 - b) Centrifugal and reaction pumps.
17. (a) What do you understand by performances characteristic curves of pumps?
(b) What are the uses of Draft tube? Describe with neat sketches different types of draft tube?

FACULTY OF ENGINEERING

B.E. (ECE) III - Semester (CBCS) (Backlog) Examination, December 2019

Subject : Electronic Devices

Time : 3 hours

Max. Marks : 70

Note: Answer all questions from Part-A. Answer any Five questions from Part-B.

PART – A (20 Marks)

- | | |
|---|---|
| 1 Distinguish between Drift and Diffusion currents in semiconductors. | 2 |
| 2 Draw the V-I characteristics of PN junction diode and explain significance of cut in voltage. | 2 |
| 3 Compare Half wave and full wave rectifiers. | 2 |
| 4 Define early effect. | 2 |
| 5 Common emitter transistor has collector current $I_C = 10$ mA. Emitter current $I_E = 10.02$ mA; calculate base current, alpha and beta values. | 2 |
| 6 Define h-parameters of BJT for common base configuration. | 2 |
| 7 Compare various types of MOSFETS. | 2 |
| 8 Mention main advantages of JFET over BJT. | 2 |
| 9 What are the various applications of SCR? | 2 |
| 10 Draw the VI characteristics of UJT and label various components. | 2 |

PART – B (50 Marks)

- | | |
|---|----|
| 11 a) Derive an expression for total diode current starting from Boltzman relationships interms of applied voltage. | 6 |
| b) A PN junction diode has a reverse saturation current of $30\mu\text{A}$ at a temperature of 125°C . At the same temperature find dynamic resistance for 0.2V bias in forward and reverse directions. | 4 |
| 12 a) Distinguish between HWR, FWR and bridge rectifiers. | 4 |
| b) A diode has an internal resistance of $20\ \Omega$ and $1000\ \Omega$ load from 110V_{rms} source of supply voltage. Calculate efficiency of rectification , percentage of regulation from no load and full load. | 6 |
| 13 a) Draw the practical circuit of BJT common emitter configuration and explain its principle to obtain VI-characteristics. | 5 |
| b) For a common base configuration $I_E = 5.01$ mA ; and the base current is 0.01 mA ; calculate the values of collector current I_C , alpha and beta. | 5 |
| 14 a) Derive an expression for stability factor for potential divider bias circuit. | 5 |
| b) Explain how do you obtain graphically hybrid parameters of a transistor. | 5 |
| 15 a) Common emitter transistor with collector to base bias circuit has $V_{cc} = 10\text{V}$; $R_C = 2\ \text{k}\Omega$ and $R_B = 100\ \text{k}\Omega$; calculate quiescent point and stability factor 'S' too. | 5 |
| b) Obtain an expression for Thermal stability of BJT. | 5 |
| 16 a) Derive an expression for I_D and V_{DS} for JFET interms of voltage divider bias. | 5 |
| b) For an N-channel JFET, $R_1 = 350\ \Omega$ $R_2 = 100\ \Omega$; drain resistance $R_D = 1.5\ \text{k}\Omega$ source resistance $R_s = 2.3\ \text{k}\Omega$; supply voltage $V_{DD} = 15\text{V}$; $I_{DSS} = 15$ mA; pinch off voltage $= V_P = -4.5\ \text{V}$; Calculate I_D , V_{DS} V_{GS} at Q. Also find gm. | 5 |
| 17 Write short note on the following : | 10 |
| a) Draw the energy band diagrams of tunnel diode and explain. | |
| b) Briefly explain working of CCD | |
| c) Give four applications of SCR. | |

FACULTY OF ENGINEERING**B.E. (M/P) III - Semester (CBCS)(Backlog) Examination, December 2019****Subject : Engineering Thermodynamics****Time : 3 Hours****Max. Marks: 70****Note: Answer all questions from Part-A & any five questions from Part-B.****PART – A (20 Marks)**

- 1 Define thermodynamic system. What are different types of systems? [2]
- 2 Define intensive properties with examples. [2]
- 3 Why heat transfer is considered as path function? [2]
- 4 Represent Iso thermal and Iso baric process on T-S diagram. [2]
- 5 State Clausius statement of second law of thermodynamics. [2]
- 6 Write down the relation for entropy change for an iso thermal process. [2]
- 7 Define a pure substance. [2]
- 8 What is P-V-T diagram? [2]
- 9 Sketch Dual cycle on P-V and T-S diagram. [2]
- 10 What is Gravimetric analysis? [2]

PART- B (50 Marks)

- 11 Explain the working of a constant pressure ideal gas thermometer with a neat sketch. [10]
- 12 (a) What is unsteady flow process explain the process of filling and emptying a tank by unsteady flow process. [4]
- (b) In an Air Compressor air flows steadily at the rate of 0.5 kg/s through an air compressor. It enters the compressor at 6m/s with a pressure of 1 bar and a specific volume of $0.85\text{m}^3/\text{kg}$ and leaves at 5m/s with a pressure of 7 bar and a specific volume of $0.16\text{m}^3/\text{kg}$. The internal of the air leaving is 90kJ/kg greater than that of the air entering. Cooling water in a jacket surrounding the cylinder absorbs heat from the air at the rate of 60kJ/s calculate [6]
 - (i) the power required to drive the compressor.
 - (ii) the inlet and outlet pipe cross-sectional areas.
- 13 (a) Explain the equivalence of Kelvin Plank and Clausius statements. [4]
- (b) Air at 20°C and 1.05 bar occupies 0.025m^3 . The air is heated at constant volume until the pressure is 4.5 bar and then cooled at constant pressure back to original temperature. calculate :
 - (1) the net heat flow from the air
 - (2) the net entropy change Sketch the process on T-S diagram [6]
- 14 (a) Explain why water is treated as a separate type of pure substance. How does it differ from other pure substances? [5]
- (b) Derive Clasius Claperyon equation from fundamentals. What is its significance? [5]
- 15 Explain the working principle of Stirling cycle using P-V and T-S diagram. [10]
- 16 (a) Differentiate between Otto and Diesel cycle. [5]
- (b) Explain the uses of Mollier diagram [5]
- 17 (a) Define Enthalpy and Internal energy. [5]
- (b) Give the various expressions for change in entropy in case of polytropic process. [5]

FACULTY OF ENGINEERING**B.E (AE) III Semester (CBCS) (Backlog) Examination, December 2019****Subject: Automotive Electrical and Electronics Engineering****Time: 3 hours****Max. Marks : 70****Note: Answer all questions from Part- A & any five questions from Part -B****PART – A (10 x 2 = 20 Marks)**

- 1 What is meant by headlight dazzling? [2]
- 2 What is the effect of temperature on specific gravity of electrolyte? [2]
- 3 What do you mean by cranking the engine? [2]
- 4 Which motor is preferred for starting system and why? [2]
- 5 What is armature reaction? [2]
- 6 Draw the various characteristics of shunt generator. [2]
- 7 Electronic warning system can be used for _____. [2]
- 8 How do you suppress electromagnetic interference? [2]
- 9 Name some security and warning systems used. [2]
- 10 What are the applications of microprocessor in automobile? [2]

Part B (5 x 10 = 50 Marks)

11. Write short notes on
 - a) Battery troubles and its remedies [5]
 - b) Construction of lead acid battery [5]
12. Explain different types of starter drive units with neat diagrams. [10]
13. With a neat sketch explain the working and functioning of a battery charging system. [10]
14. Write a short notes on
 - a) Sensors used for temperature measurement [5]
 - b) EMI and EMC [5]
15. Draw the pin diagram of 8085 microprocessor and explain function of each pin? [10]
16. Write short notes on
 - a) Stepper motor relay [5]
 - b) Specific gravity test and open voltage test on battery [5]
17. Write short notes on
 - a) Onboard diagnostics [5]
 - b) Solenoid principle with neat sketch [5]

FACULTY OF ENGINEERING**B.E. (CSE) III - Semester (CBCS) (Backlog) Examination, December 2019****Subject : Data Structures****Time : 3 Hours****Max. Marks: 70****Note: Answer all questions from Part-A & any five questions from Part-B.****PART – A (20 Marks)**

- 1 What is Performance Analysis and write different parameters used for measuring performance?
- 2 How many nonzero elements are there in a tridiagonal matrix of size 100 x 100?
- 3 Convert the following infix expression to postfix form $A + B * (C - D) / (F - G)$.
- 4 List out applications of queues.
- 5 Draw all possible AVL trees of height 3.
- 6 What are the traversal techniques of binary tree?
- 7 Write ADT for Graphs.
- 8 What is the meaning of Graph traversal? Write any two applications of it.
- 9 What is the worst case time complexity of quick sort? Give an example.
- 10 Explain selection sort.

PART – B (50 Marks)

- 11 Write a function to add two polynomials using arrays.
- 12 Write a function to insert and delete the element in a sorted single linked list.
- 13 (a) Write an algorithm for evaluate an expression in postfix form.
(b) What is the value of postfix expression?
 $823 \wedge / 23 * \wedge + 51 * -$
- 14 Construct the B-tree of order five by inserting the following items one by one.

C N G A H E K O M F W L T Z D P R
- 15 Explain elementary graph operation. State the difference between Breadth first search and Depth First search.
- 16 Sort the following numbers using heap sort.

15, 23, 17, 20, 2, 1, 9, 16, 6, 4, 8, 3, 13
- 17 Write short notes on the following:
(a) Hashing
(b) Spanning Trees

FACULTY OF ENGINEERING**B.E.III -Semester (IT)(Backlog) (CBCS) Examination, December 2019****Subject: DATA STRUCTURES****Time: 3 hours****Max Marks: 70****Note: Answer all questions from Part-A and any five questions from Part-B****PART-A (20 MARKS)**

- 1 Define an ADT and give an example.
- 2 Write a procedure for postfix evaluation.
- 3 Define a minimal spanning tree and give an example.
- 4 What are the stack ADT operations?
- 5 What is a threaded binary tree?
- 6 What are the properties of a red-black tree?
- 7 Differentiate static and dynamic hashing techniques.
- 8 What is the advantage of using templates in C++?
- 9 What are the advantages of linked list implementation of a stack over the linear implementation?
- 10 Explain maxheap with an example.

PART-B (50 MARKS)

- 11 a) What are the asymptotic notations? Explain with examples. (4)
b) Write an algorithm to convert infix expression to postfix expression using stacks. Explain with an example. (6)
12. a) Write an algorithm to add and subtract two polynomials using linked list. (7)
b) Explain about sub typing and inheritance in C++. (3)
13. a) Explain hashing with an example. (4)
b) What are the tree traversal techniques? Explain with an example. (6)
14. a) Explain BFS technique with an example. (4)
b) Write the Kruskals' Algorithm for finding a minimum spanning tree and find the cost of an MST for any example using Kruskals' Algorithm. (6)
15. a) Write an algorithm to implement queue using linked lists. (6)
b) Show the result of inserting the following elements into an initially empty AVL tree. 2,1,4,5,9,3,6,7 (4)
16. Write C++ function for Selection sort and trace the algorithm for the following elements.
12,2,45,1,34,56,7,85,23,15 (10)
17. Write short notes on the following.
 - a) Algorithm Specification (3)
 - b) Applications of stacks (3)
 - c) AVL trees (4)
