Code No.2012/BL

FACULTY OF ENGINEERING

B.E.2/4 (Civil) I – Semester (Backlog) Examination, October 2020

Subject: Engineering Materials & Construction

Time: 2 Hours **Max. Marks: 75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1. What are the characteristics of good building stone?
2. What are the advantages of using light weight bricks?
3. What are the various standard tests for cement?
4. What are blended cements?
5. What is gauged mortar?
6. What are the limitations of mud mortar?
7. Why is seasoning of timber necessary?
8. What are the measures of conserving energy in buildings?
9. What should be the characteristics of a good floor?
10. Differentiate between Plastering and Pointing.

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11. a) Explain the materials required and the manufacturing process of Fly ash bricks.
    b) Explain the various stages involved in manufacture of clay bricks.

12. a) With the help of flow diagram explain the process of manufacturing cement.
    b) Give some examples of light weight aggregates and the characteristics of a good coarse aggregate.

13. a) Explain ready mix concrete and its advantages.
    b) What are the guidelines to be followed while handling and storing reinforcement steel.

14. a) Use of recycled material, local material and industrial waste products help in sustainable development. Explain how.
    b) Classify the different types of varnishes based on the solvents used.

15. a) Explain in detail the complete process of plastering.
    b) With the help of a neat sketch explain the Brick Layers Scaffolding.

16. a) Neatly draw Horse shoe, Segmental and Blunt arches.
    b) Write about quick setting and rapid hardening cements.

17. a) Explain in detail the laying of ceramic tile flooring.
    b) Explain distempering and process of application.

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Code No: 2017/BL

FACULTY OF ENGINEERING

B.E. 2/4 (EEE) I – Semester (Backlog) Examination, October 2020

Subject: Electrical Circuits - I

Time: 2 Hours **Max. Marks: 75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1. Differentiate linear and non linear elements with an example.

2. Find the current in the dependent source for the circuit shown in Fig. 1

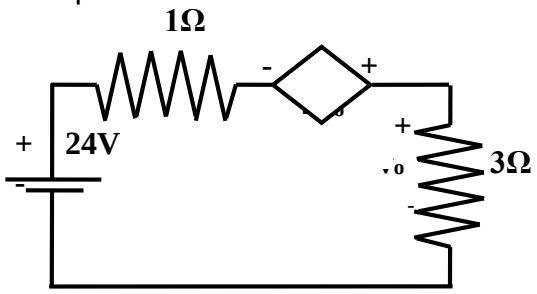

Fig.1

3. Show that in an inductive circuit the r r is zero.

4. A voltage V = 230 sin 314t source is connected across a series RL branch whose resistance R = 25Ω, C = 100 μF. Find the reactive power, power factor of the circuit.

5. Show that, the power delivered in delta connection is 3 times greater than the star connected network.

6. Show that the power delivered for a three phase unbalanced circuit is
   P = $\sqrt{3}V_L I_L COS\ \phi$

7. Define the following
   a) Graph b) Incidence Matrix

8. Represent the Norton's equivalent for the network shown in Fig.2 between terminals a and b.
   3

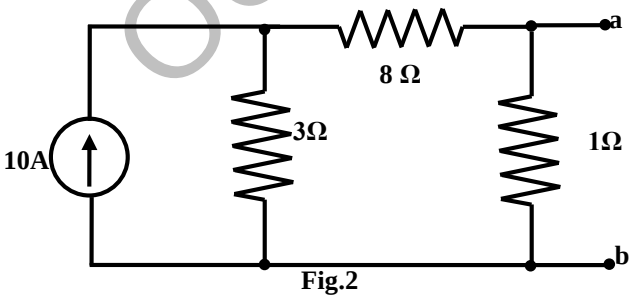

Fig.2

9. Show that in a series RLC circuit at resonance the current will be maximum.

10. What is meant by self inductance and mutual inductance?

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PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11. a) What is a dependent source? Classify and Explain.

b) For the network shown in Fig.3 determine the power loss across 15 Ω resistor by using Mesh analysis.

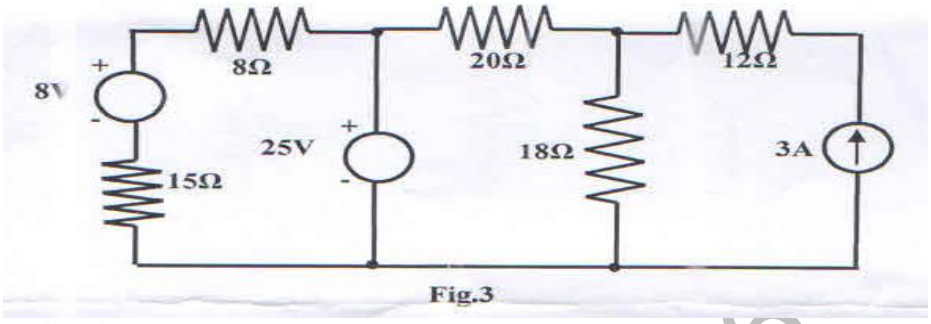

Fig.3

12. a) Define the following

(i) Instantaneous Value (ii) RMS Value (iii) Peak factor

b) A parallel circuit comprises of a resistor of 20 Ω in series with an inductive reactance 15 Ω in one branch and a resistor of 30 Ω in series with a capacitive reactance of 20 Ω in the other branch. Determine the current and power dissipated in each branch if the total current drawn by the parallel circuit is $10\angle 30^{o}$A.

13 Calculate the total power for a balanced star-connected fed from a three phase, 400 V balanced supply with phase sequence as R-Y-B. The load impedance per phase is 20+j15 Ω. Find the line and phase currents, power factor, total power, total reactive VA and Total VA and draw the phasor diagram.

14 a) For the network shown in Fig.4 formulate the tie set equations.

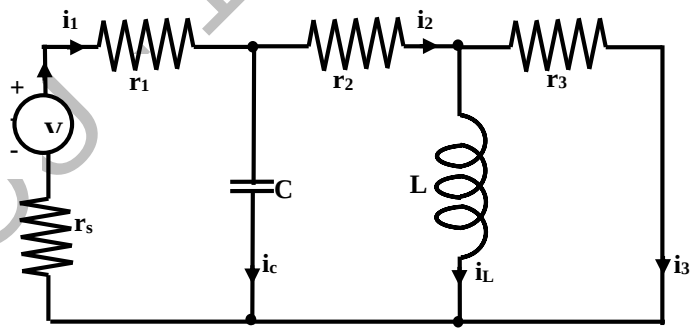

Fig.4

b) State Compensation theorem. Ve ıpensation theorem for the network shown in Fig.5 if the resistance 20 Ω is changed to 15 Ω.

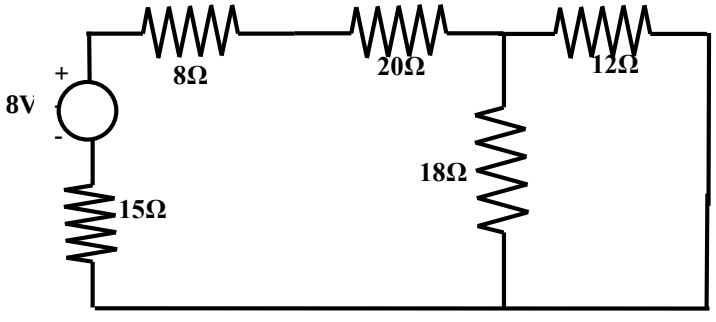

Fig.5

Contd…3..

15.a) The circuit components of parallel circuit shown in Fig. 6 are R = 60 k Ω, L = 5mH, and C = 50pF. Find
i) the resonant frequency
ii) the quality factor and
iii) the bandwidth.

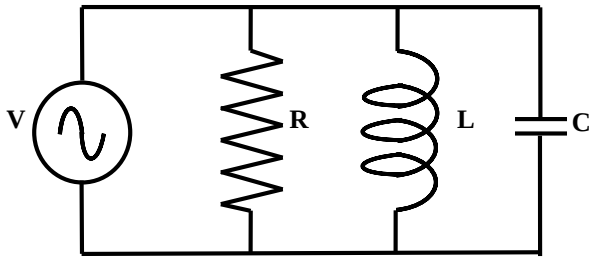

Fig. 6

b) Two coil whose self inductances L_1 and L_2 are connected in parallel, and mutual inductance between those two coils in M. Find the total inductance in parallel aiding and opposing.

16. For the network shown in Fig.7, find the suitable resistance value to deliver maximum power in place of 15 Ω by resistance and calculate the maximum power.

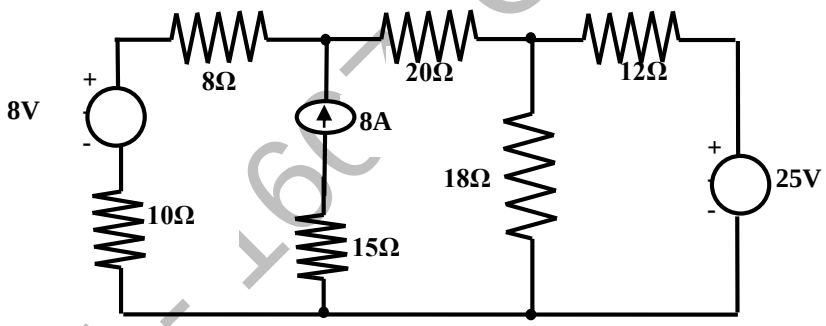

Fig.7

17. What is the significance of form factor. Find the form factor and crest factor of a square wave whose magnitude is 10V.

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Code No: 2020/BL

FACULTY OF ENGINEERING

B.E. 2/4 (Inst.) I - Semester (Backlog) Examination, October 2020

Subject : Network Theory

Time: 2 Hours **Max. Marks: 75**

PART – A

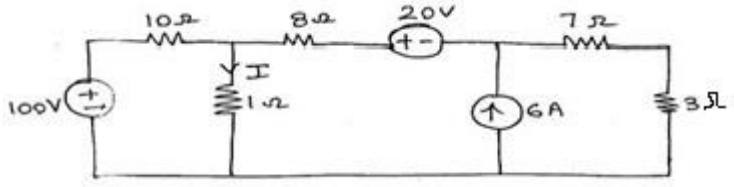
Note: Answer any seven questions. **(7x3 = 21 Marks)**

1. State Super Position Theorem? and write it's limitations?
2. Derive Energy stored in capacitance?
3. What is Duality? And write its dual pairs?
4. Define Ramp function?
5. For a series R-C circuit R=20Ω & C=100μF. Determine Impedance and power factor of the circuit? (Consider f = 60Hz)
6. Define (i) Average Value (ii) RMS Value (iii) Form Factor
7. Define (i) Resonance (ii) Bandwidth (iii) Selectivity?
8. Define coefficient of coupling?
9. Write the generalized equations of h-parameters of a two port network?
10. For a two port network, Z_{11} = 10Ω, Z_{12} = Z_{21} = 5Ω & Z_{22} = 15Ω. Determine Y-parameters?

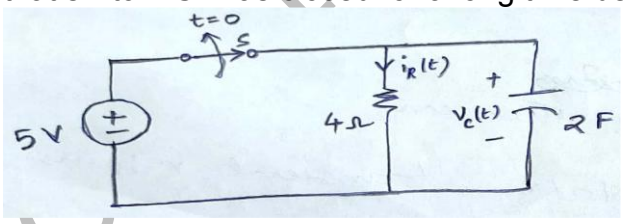
PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

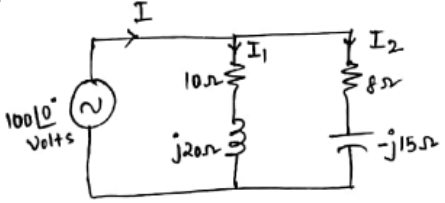
11. Determine the current 'I' using Thevinin's Theorem?



12. Calculate the voltage $V_c(t)$ and current $i_R(t)$ for t ≥ 0 for the circuit shown in fig below. Assume that switch "S" was closed for a long time before being opened a t = 0.



13. Find I, I_1, I_2 for given series-parallel circuit?



14. Derive the line/phase voltages, line/phase currents in (i) star connected system and (ii) delta Connected system? Draw Phasor diagrams for (i) & (ii)

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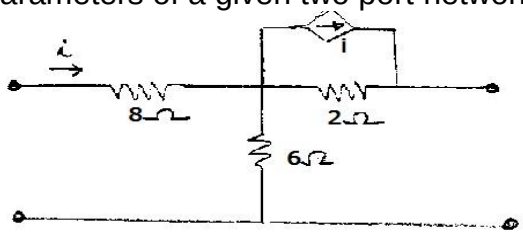
15. Determine Y- parameters of a given two port network?



16. (a) Calculate half power frequencies, resonant frequency, Bandwidth and Q-factor for a series RLC circuit with R=0.8Ω, L=110mH & C=70μF.
    (b) Derive ABCD-parameters for cascade connection of 2 two port network?

17. (a) Classify & Explain Coupled Circuits.
    (b) Derive RMS value & Average value for sine wave?

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Code No: 2025/BL

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I-Semester (Backlog) Examination, October 2020

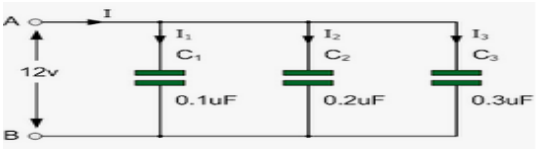
Subject: Basic circuit analysis

Time: 2Hours **Max. Marks: 75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1. State KVL and KCL and give example
2. Find the equivalent capacitance of the following circuit

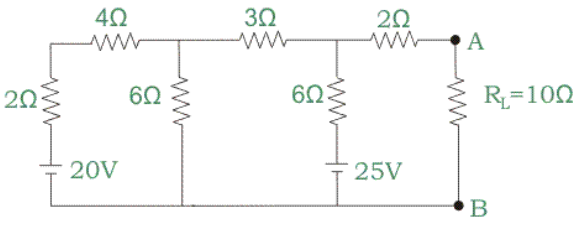


3. Define Time constant for RL and RC circuits
4. Mention the three types of responses for a second order differential circuits with the necessary conditions for the same.
5. Give the expression of average and rms values and calculate the same for the signal v(t) = 10 cos (30t+15) Volts
6. Define coefficient of coupling in magnetically coupled circuits
7. Draw the two port network model of ABCD parameters
8. What is an ideal transformer
9. What is pole and zero of a function. Explain with example.
10. Draw the response of parallel resonant circuit and indicate whether the current or voltage is maximum at the resonating frequency and why.

PART – B

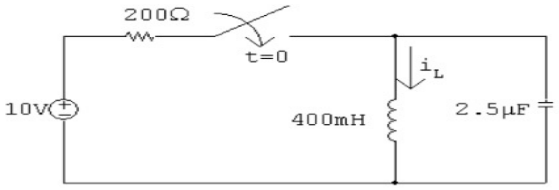
Note: Answer any three questions. **(3x18 = 54 Marks)**

11. a) Calculate the thevenins equivalent for the following circuit. (6)



b) State and prove maximum power transfer theorem

12. Obtain $i_L(t)$ and $v_L(t)$ for the following second order series RLC circuit.



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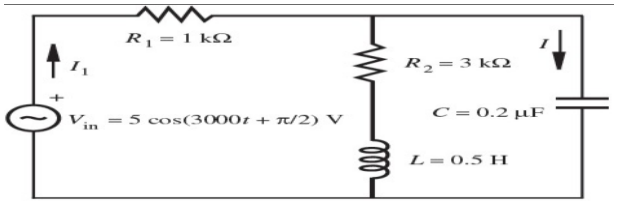
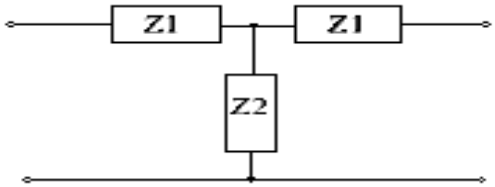
13. a) Apply mesh analysis to the following AC circuit



b) Define the terms complex power, resistive power and reactive power.

14.a) State reciprocity theorem and derive condition for reciprocity in terms of z parameter.

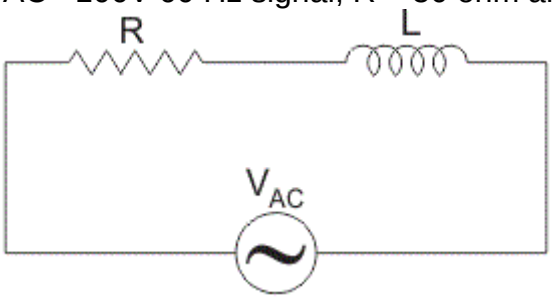
b) Obtain the z parameter equivalent of the following circuit. Given Z1= 2Kohm, Z2=4+j3 Kohm



15.a) Derive the expression of resonant frequency in terms of quality factor and bandwidth for a series resonant circuit.

b) Draw the pole zero plot for the following expression $H(s)=(S^2+5s+6)/(S^2+8s+1)$

16.a) Consider a Series RL circuit shown below. Calculate apparent power, power factor and average power given VAC =100V 60 Hz signal, R = 50 ohm and L = 160mH



b) State and prove tellegens theorem with an example.

17. Write short notes on the following

a) DOT convention

b) Power factor

c)Resonant frequency of Tank circuit

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Code No. 2029 /BL

FACULTY OF ENGINEERING

B.E. 2/4 (M/P/A.E) I – Semester (Backlog) Examination, October 2020

Subject: Metallurgy and Material Science

Time: 2hours **Max. Marks: 75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1. State the effect of grain size on mechanical properties.
2. Write the characteristics of ductile fracture.
3. What is cumulative fatigue?
4. List the applications of diffusion in mechanical engineering.
5. Draw the cooling curve for pure iron and show the different allotropic form of iron on it.
6. What is the effect of carbon on properties of steel?
7. Define tempering. What are main aims of tempering?
8. What is age hardening?
9. List various stages involved in extraction of copper.
10. How do you classify composite materials?

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11. (a) What is critical resoled shear stress? Derive the equation relating the tensile stress with critical resolve shear stress.
    (b) Explain different modes of fracture with the help of neat sketches.
12. (a) Define Fatigue. Explain various factors which affect the fatigue life of a material.
    (b) Differentiate between creep curve and stress rupture curve.
13. (a) Draw and explain a typical phase diagram in which two metals are completely soluble in liquid state and completely insoluble in the solid state.
    (b) Describe the composition, properties and applications Grey Cast iron.
14. (a) Explain Austenite to martensite transformation of eutectoid steel with the help of TTT diagram.
    (b) Differentiate between austempering and martempering.
15. (a) Draw a neat sketch of cupola furnace and describe the production of cast iron.
    (b) Explain the method of production of steel by using electric Arc Furnace.
16. (a) Describe various stages of annealing of cold worked metal.
    (b) What is low cycle fatigue? Explain the method to estimate the fatigue damage in metals.
17. Write short notes on the following:
    (a) Plain carbon steels.
    (b) Carburizing.
    (c) Applications of Powder Metallurgy.

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Code No. 2036/BL

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) I-Semester (Backlog) Examination, October 2020

Subject : Discrete Structures

Time : 2 Hours **Max. Marks: 75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1 Define Predicate. With an example.
2 In a class of 50 college freshmen, 30 are studying BASIC, 25 are studying Pascal, and 10 are studying both languages. How many freshmen are studying either computer language.
3 Define one-to-one function with an example.
4 In how many ways can 3-xaminations be conducted within a week, so that 2-examinations are not scheduled on same day?
5 Find the solutions to the recurrence relation with the initial conditions $a_o = 2$, $a_1 = 5$, $a_n = 6a_{n-1} - 11a_{n-2}$.
6 Define POSET. With an example.
7 Define Abelian group. With an example.
8 List the general properties of an Algebraic system.
9 Define the Chromatic number with an example.
10 Write any two properties of trees.

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 (a) Simplify the expression

$$\overline{\overline{(A \cup B) \cap C} \cup \overline{B}}$$

(b) A student visits an arcade each day after school and plays one game of Laser Man, Millipede, or Space Conquerors. In how many ways can he play one game each day so that he plays each of the three types at least once during a given school week?

12 (a) Let f, g : R $\rightarrow$ R where $g(x) = 1 - x + x^2$ and $f(x) = a\,x + b$. If $(gof)(x) = 9x^2 - 9x + 4$ determine a, b.
(b) Professor Ruth has five graders to correct programs in her courses in APL, BASIC, FORTRAN, Pascal and PL/I. Graders Jeanne and Charles both dislike FORTRAN. Sandra wants to avoid BASIC and PL/I. Paul detestes APL and BASIC and Todd refuses to work in FIRTRAN and Pascal. In how many ways scan Professor Ruth assign each grader to correct programs in one language, cover all five languages, and keep everybody content?

13 (a) Find the solutions of the recurrence relation $a_n + 5a_{n-1} + 6a_{n-2} = 3n^2$.
(b) Solve the recurrence relation $a_n = 3a_{n-1}$ for k = 1, 2, 3…. And initial condition $a_o = 1$ using Generating functions.

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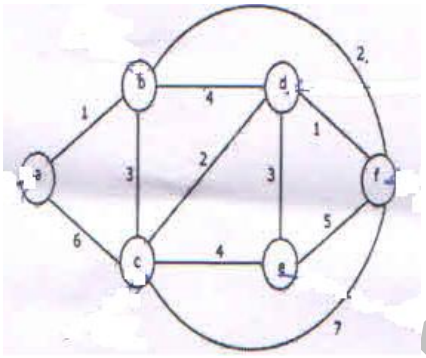
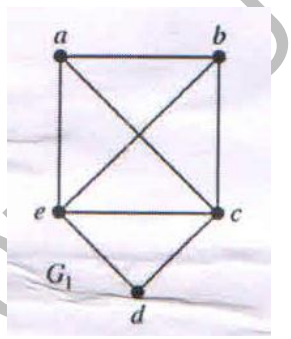
14 (a) Show that the set N of natural numbers is a semi group under the operation $x * y = \max \{ x , y\}$. Is it a monoid?

(b) Show that the set Z with binary operation * such that x * y = xy is not semi group.

15 (a) Find minimum spanning tree using Prim's algorithm.



(b) Define the Hamilton circuit and path. Find the following graph G_1 has Hamilton circuit or path.



16 (a) How many arrangements can be made out of the letters of the world 'ENGINEERING'?

(b) How many integer solutions are there for the equation

$C_1 + C_2 + C_3 + C_4 = 20$ of $0 \leq C_i \leq 7$ for al $1 \leq i \leq 4$?

17 (a) For a group 'G'. f is mapping from G to G(fx) = x^2. Prove that G is an a abelian group.

(b) Write short notes on the following:

(i) Planar graph (ii) Bipartite graph with an example.

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Code No: 2041/BL

FACULTY OF ENGINEERING

B.E. 2/4(I.T.) I Semester (Backlog) Examination, October 2020

Subject: Digital Electronics and Logic Design

Time: 2 hours **Max Marks: 75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1 Using algebraic manipulation prove that (x+y) (x+y') = x
2 Define Clock skew and hold time of a Flip – Flop
3 What is a state table? Give an example
4 Convert $(247.36)_8$ to equivalent hex number.
5 Differentiate between CPLDs and FPGAs
6 Give the functionality of SR – Latch
7 Distinguish between Moore and Melay state model
8 Explain D multiplexers
9 Define VHDL code for 4 x 1 multiplexer.
10 Explain static and dynamic hazards.

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 Find the minimum cost SOP forms for the function
$f(x_1, x_2, x_3, x_4) = \Sigma m(1, 4, 5,6,7,10,11,14)$, draw the logic circuit using NAND gate alone. Write VHDL code for the above function.

12 (a) Explain the structure of CPLD in detail.
(b) Draw neatly the 3 – input LUT.

13 (a) Draw J-K flip flop using NAND gates and explain its operation
(b) Define Gated SR latch, Gated D latch with neat circuit diagram

14 Write short notes on the following
(a) Clock Synchronization
(b) Asynchronous Sequential Circuits

15 (a) An FSM is defined by the state assignment table. Derive a circuit that realizes this FSM using D-Flip Flops.

Present State	Next State		Output
Y_2Y_1	W=0	W=1	Z
	Y_2Y_1	Y_2Y_1	
00	10	11	0
01	01	00	0
10	11	00	0
11	10	01	1

(b) Design a 3 – bit Down Counter.

….2

16 Explain in detail about Analysis, Synthesis, State Reduction of Asynchronous sequential circuits.

17 (a) Design a circuit using FSM that meets the following specification:
(i) The circuit has one input w and output z

(ii) All changes in the circuit occur on the positive edge of a clock signal

(iii) Output z is equal to 1 whenever the sequence 1010 is deleted. Otherwise the value of z is equal to 0.

(b) Explain in detail about the behavior and analysis of asynchronous sequential circuits using an example.

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Code No. 2521/CBCS/BL

FACULTY OF ENGINEERING

B. E. (Civil) (CBCS) III - Semester (Backlog) Examination, October 2020

Subject: Engineering Geology

Time: 2 hours **Max. Marks: 70**

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1. Write about geological classification of rocks.
2. Differentiate between Fold & a fault.
3. Define the term weathering and erosion.
4. Define Soil. List out the names of Indian Soils.
5. Write about ground water table & mention its layers.
6. Differentiate between specific yield and specific retention.
7. The diameter of the rock disc (3 amph) was 6.0 cm and the length of the sample was 12 cm, if failure occurred at a load of 29 tons, what could be the uniaxial compossive strength of the sample.
8. Define Dam & Label its parts.
9. Explain various engineering properties of rocks.
10. Define earthquakes. Mention any two causes for it.

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11. Define fault; classify different types of faults and add a note on their Civil engineering importance.
12. (a) Explain about formation of soil. Add a note on Black Cotton Soil.
    (b) Write about various structures of Igneous rocks.
13. (a) Define Darey's law, explain about movement of ground water in soft rock terrain.
    (b) Write about various types of Airial Photography.
14. (a) State the principle and methodology involved in electrical resistivity method in ground water prospecting.
    (b) Write a note on unconformity. Explain various types of unconformity.
15. Describe in detail various types of problems associated with
    (a) Dam's (b) Reservoir's.
16. (a) Write a note on groundwater problems associated with Tunnels.
    (b) Explain about various depocitional factors associated with River (Flurial) and form.
17. (a) Geological & geotechnical considerations taken care while selecting a rock as building stone.
    (b) Explain in detail what are the various geological hazards caused due to earthquake.

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Code No: 2529/CBCS/BL

FACULTY OF ENGINEERING

B.E. III-Semester (CBCS) (EE/Inst.) (Backlog) Examination, October 2020

Subject: Prime Movers and Pumps

Time: 2 hours **Max. Marks: 70**

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1. Enlist the various types of fluid flow?
2. Sate the significance of Reynolds number?
3. State the functions of a draft tube in reaction turbine
4. State the purpose of air vessels.
5. State the difference between centrifugal and reciprocating pump
6. State the properties of steam
7. What is the function of a casing in a pelton turbine?
8. Write the applications of gas turbines?
9. How are the steam turbine classified?
10. What are boiler mounting and accessories

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11 a. Derive the continuity equation for one dimensional steady flow
   b. A horizontal venturimeter with inlet and throat diameter 30 cm and 15 cm respectively is used to measure flow of water. The reading of differential manometer connected to the inlet and the throat is 20cm of mercury. Determine the rate of flow. Take Cd = 0.98.

12 a. Describe the working principle of an Kaplan turbine with neat sketch.
   b. A pelton wheel is having a mean bucket diameter of 1 m and is running at 1000 rpm. The net head on the Pelton wheel is 700m. if the side clearance angle is 15^o and discharge through nozzle is $0.1m^3$/sec. find Power available at the nozzle and Hydraulic efficiency of the turbine.

13 a. Describe the working principle of centrifugal pump with neat sketch.
   b. A single acting reciprocating pump, running at 50 rpm delivers 0.01 m^3/s of water. The diameter of the piston is 200 mm and stroke length 400 mm. Determine the theoretical discharge and coefficient of discharge.

14 a. Mention the merits and demerits of fire tube boilers.
   b. Describe the working of Modified Rankine cycle for steam engine.

15 a. Differentiate between impulse turbine and reaction turbine – state five differences
   b. Explain the working of a constant volume combustion gas turbine with a neat sketch.

16. a. Derive an expression for the loss of head due to friction in pipes. When 1) paralles 2) series
   b. Differentiate between flywheel and governor. State five difference.

17. a. What is orifice meter of working derive an expression for the discharge through a orifice meter.
   b. State five limitations of gas turbine

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Code No: 2535/CBCS/BL

FACULTY OF ENGINEERING

B.E. III - Semester (CBCS) (ECE) (Backlog.) Examination, October 2020

Subject : Electronic Devices

Time: 2 hours **Max. Marks: 70**

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1) For a silicon diode calculate the voltage across the diode if the forward current through it is 1mA
2) Determine the AC resistance of the Ge diode for a Forward bias voltage of 0.29V, reverse saturation current is 1 μA.
3) Distinguish Avalanche and Zener break down phenomenon.
4) Explain the purpose of Bleeder resistor in LC filter.
5) What is Early effect in Bipolar junction transistor .
6) Explain diode compensation technique for the BJT amplifier.
7) Draw the Hybrid model of BJT .
8) What is UJT, Draw its structure and plot its V-I.
9) Draw the structure of Enhancement MOSFET.
10) Prove that the trans-conductance of the JFET is given as $g_m = \frac{2}{|V_P|}\sqrt{I_D\ I_{DSS}}$.

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11) a) Explain the concept of formation of PN junction in semi conductor diode.
b) Derive the expression for the diffusion capacitance in forward bias of the PN junction diode.

12) Draw the circuit diagram of a Half wave rectifier and explain its operation, derive its Ripple factor, Efficiency, TUF, PIV, % Regulation.

13) a) Draw the circuit diagram of BJT in common base configuration and explain its input, output V-I characteristics.
b) Draw the circuit diagram of BJT with Fixed bias and determine the expression for its stability factor

14) a) For a common emitter amplifier with R'_S = 1kΩ , R'_L = 5 kΩ assume the H – parameters values are h_{ie} = 1.1k Ω, h_{re} = 250 μ , h_{fe} = 50 , h_{oe} = 25 μ mhos,
Determine the following parameters
i) current gain A_I ii) input resistance R_I
iii) voltage gain A_V iv) output resistance R_O
b) Draw the structure of SCR and briefly explain its principle of operation and plot its V-I characteristics.

15) a) Draw and explain the V-I characteristics of JFET in Common source configuration.
b) For a JFET amplifier in Common Gate configuration, derive the expressions for
i) current gain A_I ii) input resistance R_I
iii) voltage gain A_V iv) output resistance R_O

16) a) Design a SELF bias circuit to establish the Q-point at I_C = 1mA, V_{CE} = 6V. Use a transistor with β = 200 and V_{BE} = 0.65V. Given V_{CC} = 12V, Stability factor is S = 10. Use R_C = 4.7KΩ.
b) Draw the circuit of full wave rectifier with Capacitor filter and derive the expression for its ripple factor

17) Write short notes on the following:
a) Photo diode b) DIAC c) Tunnel Diode

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Code No.2539/CBCS/BL

FACULTY OF ENGINEERING

B.E. III-Semester (CBCS) (M/P) (Backlog) Examination, October 2020

Subject : Engineering Thermodynamics

Time: 2 hours **Max. Marks: 70**

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1 Define the thermodynamics systems with examples.
2 Differentiate between intensive and extensive properties with examples.
3 Discuss free expansion.
4 Define a PMM 1? Why is it impossible?
5 State the second law of thermodynamics.
6 Explain the Clausius inequality.
7 Define pure substances with examples.
8 Discuss the uses of Mollier diagram.
9 Sketch the P-V and T-S diagram for a dual combustion cycle.
10 Define mole fraction and mass fraction.

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11 a) Discuss the concept of thermodynamic equilibrium.
b) Define Zeroth law of thermodynamics and state its importance.

12 a) Derive the steady flow energy equation.
b) A fluid is confined in a cylinder by a spring loaded frictionless piston so that the pressure in the fluid is a linear function of the volume, given by P=a+bV. The internal energy of the fluid is given by the relation U=34+3.15 pV, where U is in kJ, p in kPa and V is in m^3. If the fluid changes from an initial state of 170 kPa, 0.03 m^3 to a final state of 400 kPa, 0.06 m^3, with no work other that done on the piston, evaluate the direction and magnitude of **i)** Work Transfer and **ii)** Heat transfer

13 a) Explain the equivalence of Kelvin Planck and Clausius statements.
b) Define entropy and establish the inequality of Clausius.

14 a) Draw and explain the phase equilibrium diagram for a pure substance on T-s plot with relevant constant property lines.
b) Evaluate the enthalpy and entropy of steam when the pressure in 2 MPa and the specific volume is 0.09 m^3/kg.

15 a) Distinguish between Otto cycle and Diesel cycle.
b) Explain the Dalton's Law of partial pressures and Amagat's law of partial volumes as applied to gas mixtures.

16 a) Explain the concept of continuum in thermodynamics.
b) Apply the first law of thermodynamics for a cycle and a process.
c) Explain entropy, Gibbs Function and Helmholtz function.

17 a) Derive the four Maxwell's relations.
b) Explain the Rankine cycle with detail diagrams.

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Code No. 2544/BL

FACULTY OF ENGINEERING

B.E (AE) III Semester (CBCS) (Backlog) Examination, October 2020

Subject: Automotive Electrical and Electronics Engineering

Time: 2 hours **Max. Marks: 70**

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1. Name various essential accessories of a vehicle?
2. What is insulated return system?
3. Draw the mechanical characteristics of a series motor.
4. Starter motor takes _____ current due to _____ torque.
5. Which single unit regulator is required for battery charging with alternator system and why?
6. What is the purpose of voltage and current regulator?
7. State any two troubles of starting motor.
8. What is electromagnetic interference?
9. Name various sensors used for position displacement.
10. List the various lights used in modern car.

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11. Name the drive arrangements of starting system. Explain them in brief?

12. Write short notes on
    a) Characteristics of battery
    b) Maintenance and charging of a battery

13. Write short notes on
    a) Electronic dashboard instruments.
    b) Security and warning system.

14. Write a short notes on
    a) DC shunt generator characteristics.
    b) Explain third brush regulation.

15. With a neat sketch explain Architecture of 8085 microprocessor.

16. Discuss in detail current trends in automotive electronic engine management system.

17. Write a short notes on
    a) Starting switches
    b) Explain HRD and cell gravity tests.

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FACULTY OF ENGINEERING

B.E. (CSE) III - Semester (CBCS) (Backlog) Examination, October 2020

Subject : Data Structures

Time: 2 hours **Max. Marks: 70**

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1 Differentiate between single linked and double liked list.

2 What is sparse matrix? Explain the sparse matrix representation?

3 Why hashing is needed? What is its advantages over others?

4 List out applications of stacks.

5 What is the difference between binary tree and binary search tree?

6 Define B-tree.

7 Explain Depte-First-Search.

8 What is minimal spanning tree?

9 What is fastest known sorting algorithm? Give an example.

10 What is the time complexity of heapsort?

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

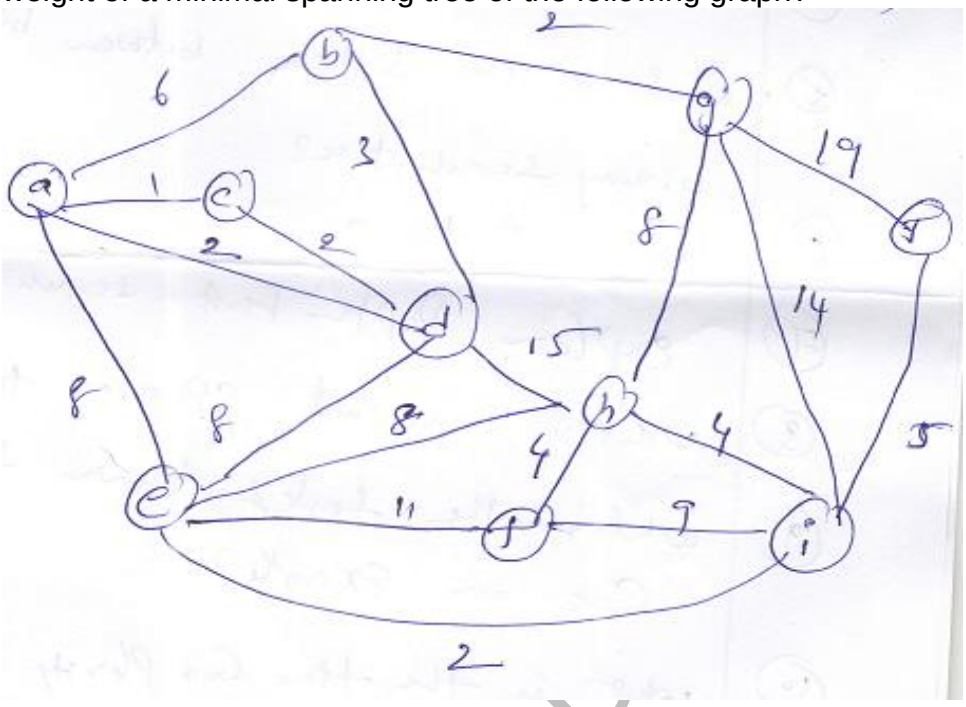
11 (a) Define single linked list. Write its applications.
(b) Write a function to reverse elements of a single linked list.

12 What is sparse matrix? Write different ways to represent it.

13 Write an algorithm to implement stack using linked representation.

14 Define AVL tree. What is balance factor? Explain about single and double rotation in AVL trees with suitable examples. Illustrate how insertion and deletion are done in an AVL tree.

15 What is the weight of a minimal spanning tree of the following graph?



16 Illustrate merge sort with an example. Write the algorithm and explain its time complexity.

17 Write short notes on the following:
(a) Spanning trees
(b) Asymptotic Notation

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Code No. 2552/CBCS/BL

FACULTY OF ENGINEERING

B. E. III – Semester (IT) (CBCS) (Backlog) Examination, October 2020

Subject: Data Structure

Time: 2 hours **Max. Marks: 70**

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

PART – A (5X2=10 Marks)

1. Write the AT for Array.
2. Differentiate between performance analysis and performance measurement.
3. Write the algorithm or function to push and pop an element from the stack.
4. Describe the row-major order of representing arrays inside the computer memory with a suitable example.
5. List the various types of hash functions.
6. State the advantage of using a head node in circular list.
7. List the advantages and disadvantages of Binary search tree.
8. Define m-way search tree.
9. Perform Insertion sort on the following keys:32, 37, 23, 44, 8, 25.
10. Describe the working of selection sort in brief.

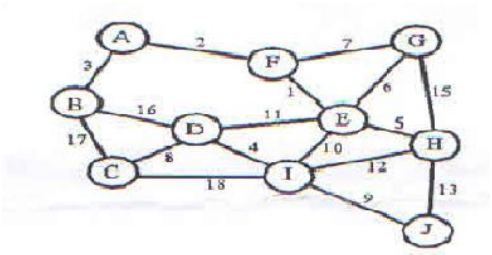
PART – B (4X15=60 Marks)

11. (a) Describe the various methods of representing Polynomial of single variable.
    (b) What is asymptotic notation of algorithm analysis? Describe the three notations big oh, theta and omega, with suitable examples.

12. (a) Write the C++ function to convert an infix expression to postfix form.
    (b) Write the algorithm or function to push and pop an element from the circular queue.

13. Write a C++ program to implement Linked Stack.

14. (a) Describe the Breadth First Search method of Graph Traversal.
    (b) Construct a minimum cost spanning tree for the following weighted graph using Kruskal's algorithm



15. (a) Write a C++ program for Quick Sort.
    (b) Describe the working of quick sort on the following keys: 10, 5, 8, 3, 2, 9.

16. (a) Define Sparse matrix. Explain the different methods of representing sparse matrices.
    (b) Explain AVL tree rotations with the help of examples/

17. Write a C++ program to implement doubly linked list.

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