Code No. 11393

FACULTY OF ENGINEERING

B.E. (Civil) III – Semester (CBCS)(Main & Backlog) Examination,
November / December 2018

Subject: Strength of Materials – I

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

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

PART – A (10x2 = 20 Marks)

1 Interpret the terms volumetric strain and bulk modulus.
2 What are bars of uniform strength?
3 Explain the term pure bending.
4 Discuss about the shear force and bending moment.
5 Sketch the core of a rectangular section (bxd) and a circular section of dia "d".
6 Sketch the shear stress distribution for a T-section.
7 State Lame's equation used for finding stresses in a thick cylinder.
8 Draw Mohr's circle for a state of stress, where two perpendicular direct stresses of 60 N/mm^2, both tensile are acting.
9 Explain the importance of shear center.
10 What is unsymmetrical bending? Explain briefly with an example.

PART – B (5x10 = 50 Marks)

11 A steel rod 20mm dia, screwed at ends, passes through a copper tube 22mm internal dia and 30mm external dia. The temperature of whole assembly is raised to 390 K and the nuts are tightened. Find the stresses if the common temperature falls to 300 K. Take E_s = 200 kN/mm^2, Ec = 100 kN/mm^2, $\alpha_S = 12x10^{-6}$ per K and $\alpha_c = 20x10^{-6}$ per K. 10

12 a) Obtain the relationship between loading SF and BM. 3
b) Find the dimensions of a rectangular timber beam to carry a u.d.l of 20 kN/m over the whole span when span is 6m. The tensile stress is not to exceed 8 N/mm^2. The depth has to be thrice the width. 7

13 Sketch the shear stress distribution across a T-section, which is subjected to a shear force of 200 kN. Its overall depth is 200 mm, Flange is of 120 mm breadth and 10 mm thick while the thickness of the web is 10 mm. 10

14 a) Obtain an expression for the circumferential stress of a thin cylindrical shell subjected to an internal pressure 'p'. 4
b) Calculate the increase in volume of a thin cylindrical shell 2m long, internal diameter 1.2m and 15mm thick, if it is subjected to an internal pressure of 8 N/mm^2. Take E = $2x10^5$ N/mm^2 and 1/m = 0.3. 6

15 Locate the shear centre for a channel section whose flange is 100 mm x 10 mm while the web is 400 mm x 10 mm. The web is kept vertical. 10

16 A beam is supported over a span of 'ℓ' with two equal overhangs of '$\ell/4$' on both ends. The entire beam is loaded with a UDL of w/unit run. Draw SFD and BMD, marking all salient values. 10

17 A short hollow column having outer sides (2m x 2m) and inner sides (1.5m x 1.5m) supports a vertical load of 100 kN on the inner diagonal, at a distance of 0.5m from the vertical axis of the column passing through centre 0. Find the stresses developed at the 4 corners of the column. 10

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Code No. 11399

FACULTY OF ENGINEERING

B.E. (EEE) III – Semester (CBCS) (Main & Backlog) Examination, November / December 2018

Subject: Electrical Circuits – I

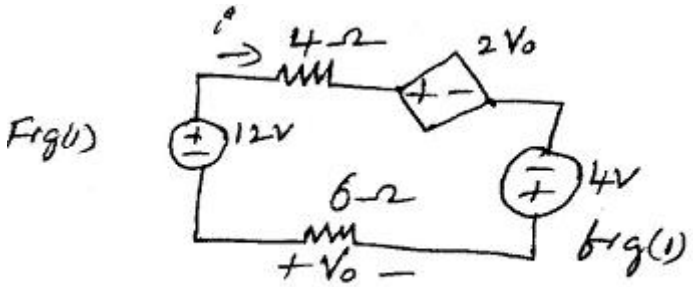
Time: 3 Hours **Max.Marks: 70**

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

PART – A (10 x 2 = 20 Marks)

1 Define ideal independent and ideal dependent source. (2)

2 Determine V_o and I in the circuit (Fig. 1). (2)



Fig(1)

3 Discuss apparent power and power factor. (2)

4 Define steady state response and resonance. (2)

5 Define bandwidth and Q factor. (2)

6 State and explain Millman's theorem. (2)

7 Illustrate and explain dot convention. (2)

8 Deduce energy in a coupled circuit. (2)

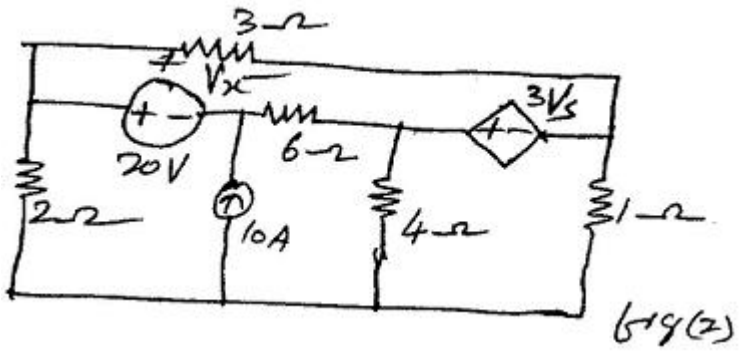
9 Define transient response. Give one example. (2)

10 Explain initial conditions of RLC Network.

PART – B (5x10 = 50 Marks)

11 a) Discuss Nodal and Mesh analysis using suitable example. 5

b) Find Node voltages in circuit using KCL and KVL of figure 2 below. 5

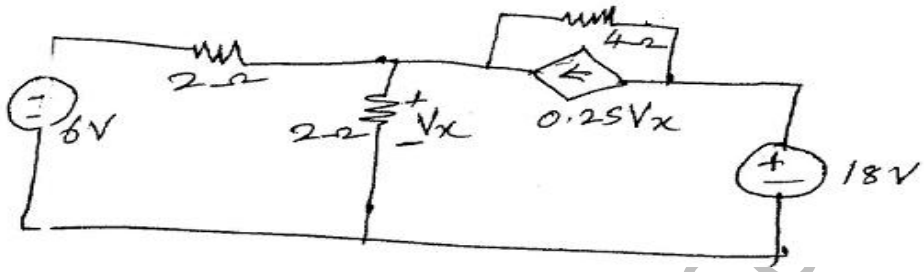


Fig(2)

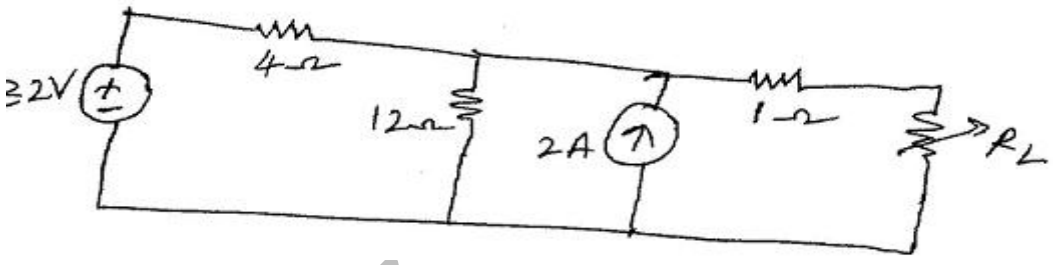
12 a) Discuss step response of RL circuits. 5

b) Draw current locus diagram of RL and RC Ckts. 5

13 a) Find V_x using source transformation. 5

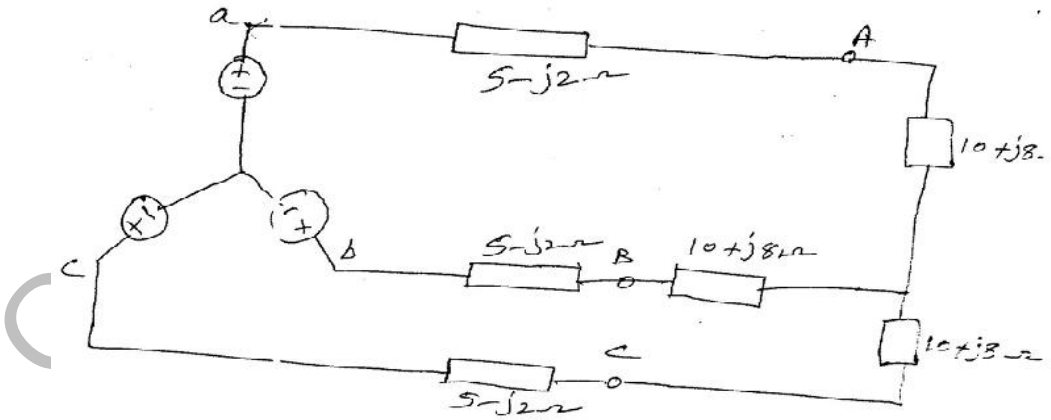


b) State thevinin's theorem, find thevenin's equivalent CKt than find current through R_L = 6, 16Ω. 5

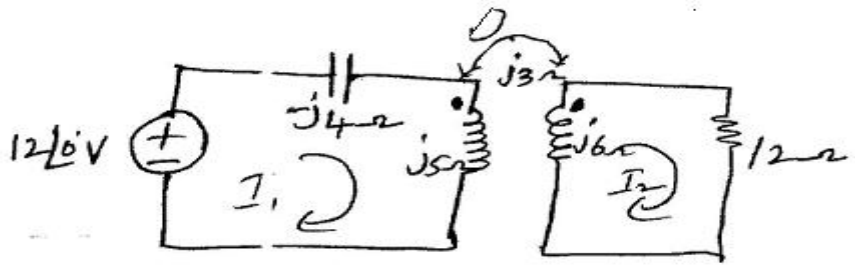


14 a) Evaluate total reactive power and total complex power in a 3 -¤ balanced system. 5

b) Calculate the line current in three wire Y – Y. 5



15 a) Calculate the phasor currents I_1 and I_2 in the circuit below. 5



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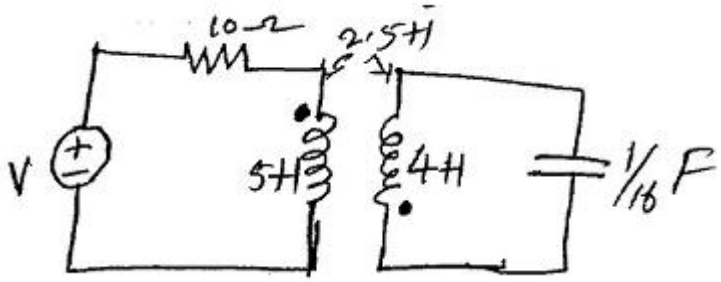
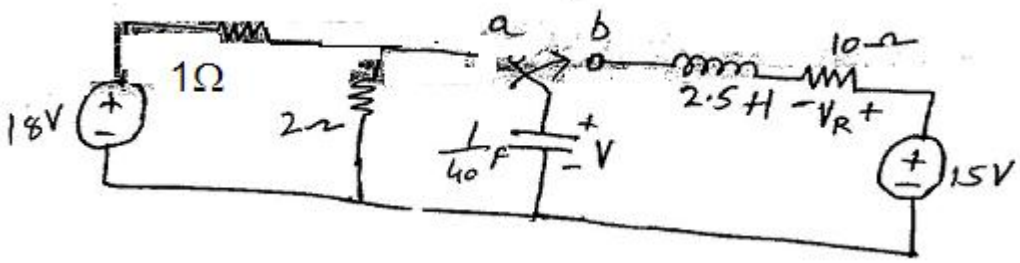
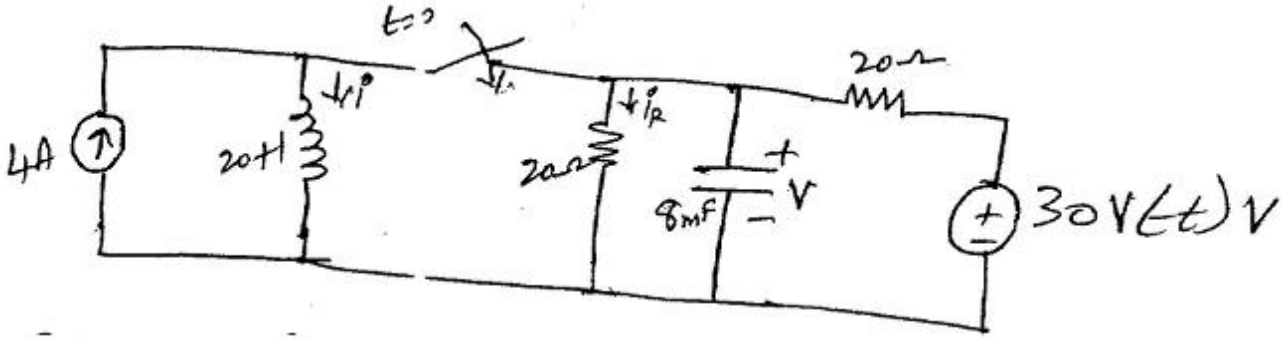
b) Calculate the coupling coefficient and energy stored in the coupled inductors at time t = 1sec if V = 60 Cos (4t + 30) V. 5



16 a) Having been in position 'a' for a long time, the switch in fig. below is moved to position 'b' at t=0. Find V(t) and $V_R(t)$ for t > 0. 5



b) In the circuit below find i(t) and $i_R(t)$ for t > t. 5



17 a) State compensation theorem and explain. 2

b) Write short note on Energy stored in inductor. 4

c) Write short note on RMS and average values of periodic sinusoidal wave form. 4

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Code No: 11403

FACULTY OF ENGINEERING

B. E. III-Semester (Inst.) (CBCS) (Main & Backing) Examination,
November / December 2018

Subject: Network Theory

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

Note: Answer all questions of Part-A, & Answer any FIVE Questions from Part-B.

PART-A (20 Marks)

1 What is an active element? [2]
2 State Krichhoff's Voltage law [2]
3 State Superposition theorem. [2]
4 Define and draw a unit ramp signal. [2]
5 Explain transient response. [2]
6 Explain active power. [2]
7 What is resonance? [2]
8 What is phase sequence of a three-phase system? [2]
9 What is two-port network? [2]
10 Define RMS value of an AC wave form. [2]

PART-B (50 Marks)

11 (a) What are the limitations of Superposition theorem? [4]
(b) Find the current in the 10Ω resistor in the network shown in fig 1 by star/Delta transformation. [6]

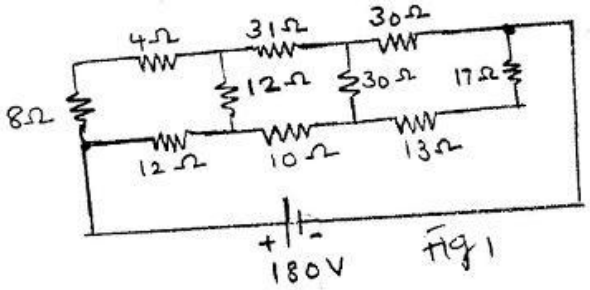

Fig 1

12 (a) Derive the expression for energy stored in a capacitance. [5]
(b) Determine the Thevenin equivalent circuit for the network external to the resistor R in the network shown in Fig 2. [5]

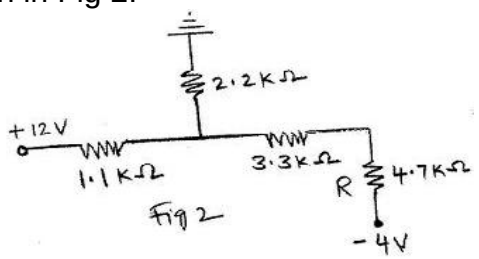

Fig 2

13 The switch 'S' in the Fig 3 has been in position 1 for a long time. It is moved to position 2 at time t=0. Obtain the expression for i for t ≥ 0. [10]

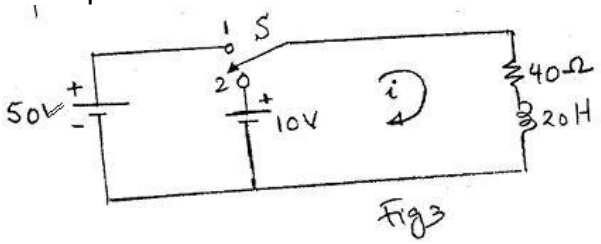

Fig3

..2

14 For the network shown in Fig 4 :
(a) Calculate the total impedance
(b) Compute I
(c) Find the total power factor
(d) Calculate I_1 and I_2
(e) Find the average power delivered to the circuit.

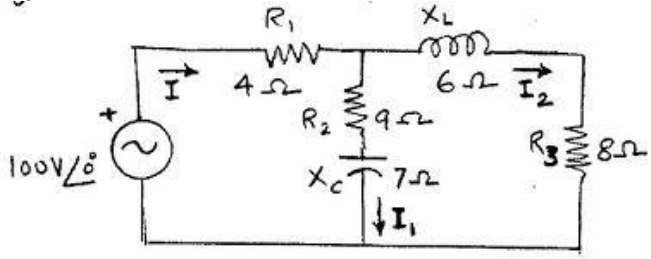

Fig 4

15 The phase sequence for the Star/ Delta system shown in Fig 5 is ABC. [10]
(a) Find the angle θ_2 and θ_3 for the specific phase sequence.
(b) Find the voltage across each phase impedance in phasor form.
(c) Find the current through each phase impedance in phase form.
(d) Find the magnitude of the line currents.
(e) Find the magnitude of the generator phase voltages.

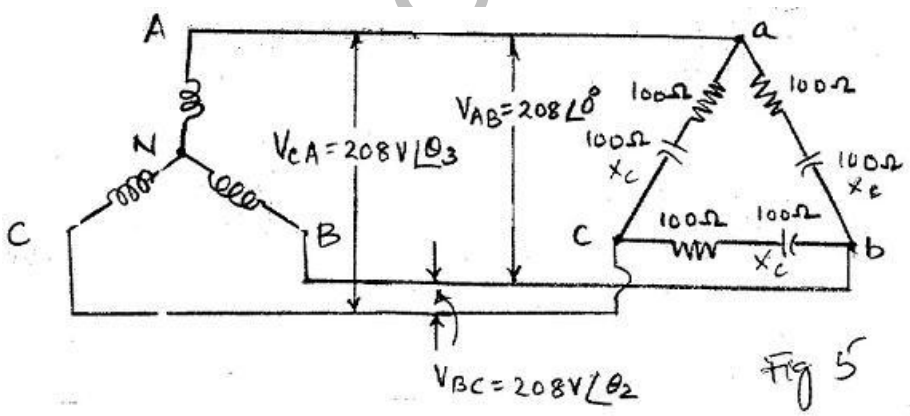

Fig 5

16 A coil having resistance 28.8Ω and inductance 0.024H is connected in series with a 0.008μF capacitance. Calculate (a) Q of the circuit (b) bandwidth resonant frequency (c) Half power frequencies. [10]

17 Determine the transmission parameters of the circuit shown in Fig 6 [10]

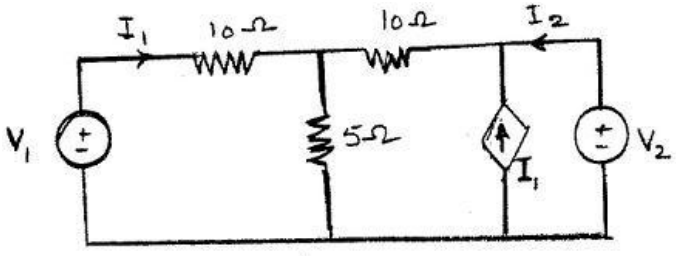

Fig 6

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Code No: 11407

FACULTY OF ENGINEERING

BE (ECE) III - Semester (Main & Backlog) Examination, November / December 2018

SIGNAL ANALYSIS & TRANSFORM TECHNIQUES

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

Note: Answer all questions from **Part-A** at one place in the same order
Answer any **five** questions from **Part -B**

PART - A (20 Marks)

1. Sketch the following signal x(t) = [U(t) – U(t -4)] (2)
2. Whether the following signals are Energy or Power? x(n) = [n U(n)] & x(n) = [r(n) -r((2)
3. Describe Analogy between vectors and Signal? (2)
4. What are the Dirichlet conditions? (2)
5. Explain wave symmetry? How many types of wave symmetries are there? (2)
6. Derive Autocorrelation property of Fourier Transform? (2)
7. Distinguish between Laplace and Fourier transform? (2)
8. What are the properties of ROC in z-domain? (2)
9. Find z transform of the following signal x(n) = [a^n Sin(nw) U(n)] (2)
10. Explain the concept of Stability and Causality in Z-domain (2)

PART - B (50 Marks)

11. (a) Obtain Trigonometric Fourier series for full wave rectified Cosine function as given below: x(t) = { A Cos(ω_0 t) } for $0 < t < \pi$; (5)
    (b) Show that the functions Sin ($n\omega_o t$) and Cos(m ω_0 t) are Orthogonal over any interval [t_0 to ($t_0 + 2\pi/\omega_0$)]. (5)
12. (a) Find Fourier transform of the following signals using properties (5)
    (i). x(t) = [e^{-at} U(t)] ; (ii) x(t) = {δ(t+2) +δ(t+1) + δ(t-1) + δ(t-2)}
    (b) The in put and out put of a Causal LTI System is described by [d^2y/dt^2 +5(dy / dt) +6 y(t) = x(t) ; find the impulse response of the system? (5)
13. (a) Find the Laplace transform of the signal x(t) ={ t^2 e^{-3t} U(t) } ; plot ROC (5)
    (b) Find inverse Laplace transform of X(s) =[s/ (s+1) (s+2)]; and hence find Initial and final values? (5)
14. (a) State and prove the initial and final value theorems in Z-domain (5)
    (b) Find the impulse response and step response for an LTI system given below y(n) = [y(n-1) + 0.5y(n-2) +x(n) +x(n-1)]; using Z-transform ? (5)
15. (a) Obtain a relation between Convolution and Correlation? (5)
    (b) Find the Autocorrelation of x(t) = A Cos ($\omega_0 t$ + Ɵ); (5)
16. (a) Derive all the properties of Cross Correlation function? (5)
    (b) Distinguish between Energy density and Power Spectral Density? (5)
17. (a) State and prove any five properties of Z-Transform? (5)
    (b) Write short notes on classification of Signals. (5)

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Code No. 11411/CBCS

FACULTY OF ENGINEERING

B.E. (M / P) III-Semester (CBCS) (Main & Backlog) Examination,
November / December 2018

Subject : Metallurgy & Material Science

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 the relation between yield strength and grain size. Write the equation.
2 What is Bauschinger effect?
3 Draw the structure of a fatigue fracture specimen.
4 Write the applications of Diffusion in the field of mechanical engineering.
5 Draw the cooling curves for pure metal and solid solution.
6 Write the applications and properties of high carbon steels.
7 Explain the process of hardening.
8 Spheroidise Annealing is not suitable for hypo eutectoid steels. State the reasons.
9 What is High speed steel? Write its composition and applications.
10 State the reasons for addition of slag in steel making.

PART – B (50 Marks)

11 (a) Explain the mechanism of plastic deformation due to slip.
(b) Define the term fracture. Discuss various types of fracture.

12 (a) Explain the experimental determination of fatigue strength with the help of a neat sketch.
(b) Explain the differences between creep curve and stress rupture curve.

13 (a) Draw the phase diagram of eutectic alloy system and explain cooling of hypo eutectic alloy.
(b) Write the composition, properties and applications of Grey cast iron.

14 (a) Explain Isothermal Transformation of austenite in eutectoid steels with the help of TTT diagram.
(b) Distinguish between carburizing and nitriding

15 (a) Draw a neat sketch of Blast Furnace and label all parts.
(b) Explain the process of production of pig iron.

16 (a) Write the differences between hot working and cold working processes.
(b) Explain the method of production of steel by electric arc furnace.

17 Write short notes on the following.
(a) Low cycle fatigue
(b) Normalizing
(c) Ductile cast Iron

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Code No: 11413/CBCS

FACULTY OF ENGINEERING

B.E. III Semester (AE)(CBCS) (Main and Backlog) Examination, November/December 2018

Subject: Thermal Engineering

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

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

PART – A (10x2=20 Marks)

1. Define Thermodynamics. How it is different from Heat Transfer.
2. What do you understand by intensive and Extensive properties?
3. What is meant by flow of work?
4. What is Polytrophic process?
5. What is a Perpetual motion machine of 2^{nd} kind (PMM-II)
6. Write the desirable properties of Ideal refrigerant.
7. Define Dryness fraction of steam.
8. State the advantages and Disadvantages of a gas turbines over IC Engines.
9. Define Free air Delivery.
10. Write the advantages of hydrogen fuel.

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PART – B (5x10=50 Marks)

11. Obtain the Equations for work done during various non flow process
    i) Isothermal Process ii) Adiabatic Process

12. A Piston cylinder device contains 0.05m^3 of the gas initially at 200kpa at this state a linear spring which has spring constant of 150 KN/m is just touching the piston but exerting no force on it heat is transferred to the gas causing the piston to raise and to compress the spring until the volume inside the cylinder doubles. If the cross-sectional area of piston is 0.25 m^2
    Find 1) Final Pressure inside the cylinder 2) Work done by the gas.

13. a) Derive steady flow energy equation and apply it for a nozzle and Turbine.
    b) How is thermal equilibrium different from the thermodynamic equilibrium.

14. Air enters the compressor of a gas turbine operating on Brayton cycle at 1.1325 kpa , 27^oC the pressure Ratio of 6 calculate maximum temperature in the cycle and cycle efficiency Assume Turbine work is equal to 2.5 times of compressor work [W_T=2.5 Wc]

15. a) Explain the working principle of vapor absorption Refrigeration system with neat sketch.
    b) Define the terms
        i. Refrigeration
        ii. C.O.P of Refrigeration

16. Obtain equations for
    a) work input to the compressor
    b) Volumetric efficiency of a Reciprocating compressor.

17. Explain working principle Fuel cell Electric Vehicle and mention advantages and disadvantages.

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Code No. 11419 / CBCS

FACULTY OF ENGINEERING

B.E. (CSE) III - Semester (CBCS) (Main & Backlog) Examination,
November / December 2018

Subject : Discrete Mathematics

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

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

PART – A (20 Marks)

1 Use truth table to verify the equivalence $p \vee (p \wedge q) \Leftrightarrow p$.
2 What is a tautology? Give an example.
3 Define a group.
4 When can we say that a function is invertible?
5 Let A={0,1,2} , B={a,b}. What is the Cartesian product of A and B?
6 Define a)Rooted tree b) Complete binary tree.
7 Define a minimum spanning tree.
8 Define an equivalence relation. Give an example.
9 Define isomorphic graphs.
10 Define in degree and out degree of a vertex in a graph.

PART – B (50 Marks)

11 a) Show that $p \vee (q \wedge r)$ and $(p \vee q) \wedge (p \vee r)$ are logically equivalent using truth table method. (5)
b) Show that $\sim(p \vee(\sim p \wedge q))$ and $\sim p \wedge \sim q$ are logically equivalent by developing a series of logical equivalences. (5)

12 a) Solve $a_n - 6a_{n-1} + 12a_{n-2} - 8a_{n-3} = 0$ by generating functions. (7)
b) Prove that for all integers $n >= 4$, $3^n >= n^3$. (3)

13 a) Find an explicit formula for the Fibonacci numbers. (5)
b) Find all the solutions of the recurrence relation $a_n=3a_{n-1}+2n$. What is the solution with $a_1 = 3$? (5)

14 a) Show that if a simple planar graph has no cycles of length 3 then $|E| <= 2|V| - 4$. (5)
b) Explain graph isomorphism with example. (5)

15 a) Explain BFS traversal of a graph with an example. (5)
b) Explain Kruskal's algorithm to find the minimal spanning tree of a graph with an example. (5)

16 a) G is a finite semigroup such that for each for each $x \in G$, there exists a unique y, such that xyx = x. Prove that G is a group. (5)
b) Explain the procedure for constructing Euler Circuits. (5)

17 Write short notes on any two of the following: (5+5)
(a) Group Homomorphism
(b) Graph Coloring
(c) Partial Ordering and Hasse diagrams

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Code No. 11421 / CBCS

FACULTY OF ENGINEERING

B.E. (IT) III-Semester (CBCS) (Main & Backlog) Examination,

November / December 2018

Subject : Discrete Mathematics

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 Show that $[(p \to q) \wedge (q \to r)] \to (p \to r)$ is a tautology by using truth table.
2 Construct the truth table for the compound propositions $(p \wedge q) \vee \neg r$.
3 Let f be function from {a, b, c} to {1, 2, 3} such that f(a) = 2, f(b) = 3 and f(c) = 1 find f^{-1} if it exists.
4 Let f and g be the functions from set of integers to set of integers defined by f(x) = 2x+3 and g(x) = 3x + 2 what is composition of f and g? What is composition of g and f?
5 Find $\sum_{k=50}^{100} k^2$.
6 How many way a committee consisting of 3 men and 2 women can be chosen from 7 men and 5 women?
7 Find the generating function of the sequence {1, -1, 1, -1, 1, -1}.
8 Constant the Hasse diagram for the poset ({1, 2, 3, 4}, ≤).
9 Define lexicographic ordering.
10 Boolean product of

$$A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \\ 1 & 0 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 0 \end{bmatrix}.$$

PART – B (50 Marks)

11 a) Show that $p \leftrightarrow q$ and $(p \wedge q) \vee (\neg p \wedge \neg q)$ are logically equivalent. 5
b) Prove that "$\sqrt{2}$ is irrational" using proof by contradiction. 5

12 a) Give a proof by contradiction of the theorem u if 3n+2 is odd then 'n' is odd. 5
b) If 'n' and 'k' are positive integers with n > k then prove that c(n+1, k) = c(n, k-1) + c(n, k). 5

13 Use the insertion sort to put the elements of the list 3,2,4,1,5 in increasing order. 10

14 a) How many different strings can be made by reordering the letters of the word success? 5
b) Let x be the number that comes up when a fair die is rolled. What is the excepted value of x? 5

..2

15 a) Solve the recurrence relation an = $5a_{n-1} - 6a_{n-2}$ with $a_0 = 1$ $a_1 = 1$. 5

b) Find number of solutions of $e_1 + e_2 + e_3 = 17$ whose e_1, e_2, e_3 are non negative integers with $2 \le e_1 \le 5$, $3 \le e_2 \le 6$, $4 \le e_3 \le 7$. 5

16 a) Define a bipartite graph give an example. 2

b) What is chromatic number of Kn? Explain. 4

c) What are the difference ways of representing graphs? Explain. 4

17 a) Find the k-map for i) $xy + \bar{x}y$ ii) $\bar{x}y + x\bar{y}$ iii) $\bar{x}y + \overline{xy} + x\bar{y}$ and simplify the sum of products. 5

b) Explain prim's algorithm to find minimum spanning tree with an example. 5

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Code No: 11053

FACULTY OF ENGINEERING

B. E 2/4 (EEE/ Inst.) II-Semester (Backlog) Examination, November / December 2018

Subject: Electronic Engineering-II

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

Note: Answer All Questions from Part-A & Any Five Question From Part-B

PART-A (25 Marks)

1. What is the effect of emitter bypass capacitor on LF response of RC coupled Amplifier? [3]
2. Explain the need for cascading? [2]
3. What are the advantages of negative feedback amplifiers? [2]
4. Draw the equivalent circuit for Current Amplifier? [3]
5. What is Barkhausen's criterion? [2]
6. Distinguish between Amplifiers and Oscillator circuits? [3]
7. What is Cross over distortion in Power Amplifiers [2]
8. Compare Class A, B & C Power Amplifiers based on efficiency? [3]
9. What is a two level clipper? [3]
10. How does a LPF act as Integrator? [2]

PART-B (50 Marks)

11. (a) Draw the equivalent circuit of a Voltage shunt feedback amplifier and derive the expressions for R_{if} and R_{of} (6)
    (b) Classify various types of feedback amplifiers and draw their block diagram? (4)

12. Discuss in detail about various kinds of Couplings. Also mention their advantages, Disadvantages and applications? (10)

13. a) An Amplifier has an input impedance of 1 KΩ and O/P impedance of 10 KΩ and a voltage gain of 10000. If a negative feedback is employed then find the resultant gain, input impedance, and output impedance. Given the feedback factor is 0.5? (4)
    b) Discuss in detail various kinds of Distortions in Amplifiers? (6)

14. a) Give the Applications of each of the different types of Oscillators? (4)
    b) Derive an expression for frequency of oscillation of Colpitt's oscillator? (6)

15. a) Explain the Operation of a Push- pull amplifier with a neat sketch? (5)
    b) What is cross over distortion? How do you eliminate it. Explain with neat sketches? (5)

16. a) Discuss the operation and derive the expressions for Square wave response of an RC High Pass Filter (6)
    b) Explain biased positive clamper with neat sketches. (4)

17. Write short notes on the following (10)
    a) Cascode amplifier
    b) Frequency response of Direct coupled Amplifiers
    c) Frequency stability of oscillators

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Code No. 11063

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) II – Semester (Backlog) Examination, November / December 2018

Subject: Switching Theory & 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. Convert $(367.54)_8$ in to Decimal and Hexadecima. (2)
2. State & Prove Consensus theorem. (3)
3. Realize an EX-OR gate using minimum number of NAND gates only (3)
4. Define Prime Implicant. (2)
5. List out the applications of Multiplexer. (2)
6. What is an unweighted code? Represent the decimal numbers 0 to 15 using Gray codes (3)
7. What is the significance of priority encoder (3)
8. Define setup time and hold time of a FF (2)
9. Applications of Shift Register (2)
10. Differentiate between Asynchronous and Synchronous counters. (3)

PART – B (50 Marks)

11 a) Simplify the following three variable Boolean expressions using Boolean Algebra and implement using basic logic gates
$F(a,b,c)=\sum m(0,1,3,4,7)$. (5)

b) Using K-map obtain the minimal SOP expression for the given switching function
$F(a,b,c,d)= \sum m(0,2,8,9) + d(3,7,10,11,14,15)$. (5)

12 Simplify the given expression using Quine Mc Cluskey Method
$F(w,x,y,z)= \sum m(1,3,5,10,11,12,13,14,15)$. (10)

13 Design a BCD to Excess 3 code converter. (10)

14 Design a 3-bitbidirectional shift register using JK Flip flops having right and left data inputs and Mode control M such that M=0 left shift, M=1 right shift. (10)

15 Explain two's complement ADD/Subtractor using block diagram. (10)

16 a) Design a full adder and implement it using IC 74151. (5)

b) Design a 3 to 8 decoder circuit using 2 to 4 decoder circuits. (5)

17 Write short notes on any two of the following: (10)
a) Race around condition and elimination
b) Hazards and Hazard free realization
c) Parity code.

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Code No.11067

FACULTY OF ENGINEERING

B.E. 2/4 (M/P/CSE) II-Semester (Backlog) Examination, November / December 2018

SUBJECT: Electrical Circuits and Machines

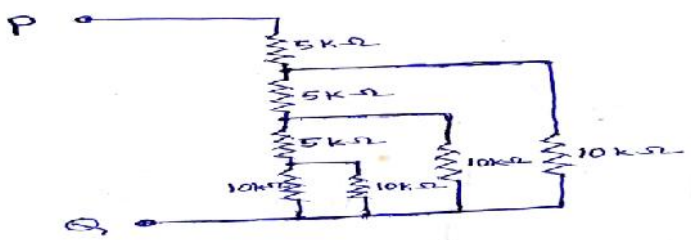
Time: 3 Hours **Max. Marks : 75**

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

PART-A (25 Marks)

1. Define peak factor and form factor. 2

2. Calculate the resistance across PQ in the circuit shown below. 3



3. What do you understand by 3-phase balanced circuit? 2

4. Derive the condition for maximum efficiency in a single phase transformer. 3

5. What is the necessary of starter for a dc motor? 2

6. What are the functions of commutator in a dc machines. 3

7. Compare squirrel cage and slip ring three phase induction motors. 3

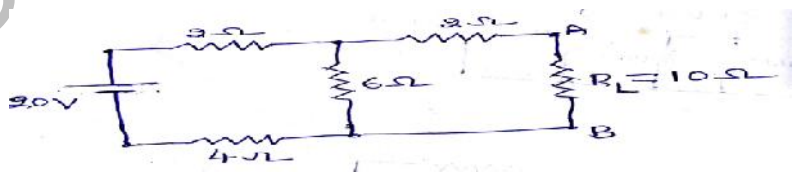
8. How an induction motor can be consider as generalized transformer? 2

9. Mention various types of single phase induction motors. 3

10. How brushless dc motor is differ from conventional dc motor. 2

PART-B (50 Marks)

11. a) Calculate current in 10Ω resistance by using thevenin's theorem for the circuit shown below. 6



b) Explain about basic idea of coupled circuits. 4

12 a) derive the EMF equation of a single phase transformer. 5

b) Three identical inductive loads of resistance 15Ω and reactance of 40Ω are connected in star to a 440v ,three phase supply ,calculate i) phase current, ii)line current iii) power absorbed. 5

…2

13 a) Draw and explain the characteristics of a dc series and shunt generator. 5

b) A 30 KW, 300v, dc shunt generator has armature and field resistance of 0.05 ohm and 100 ohm respectively. Calculate the generated emf and power delivered by the armature. 5

14 a) Explain about star-delta method of starting of a three phase induction motor with the help of neat schematic diagram. 7

b) A 3-phase, 4-pole induction motor when connected to a 50Hz supply, runs at a speed of 1440 r.p.m at full load. Calculate the synchronous speed and the slip. 3

15 a) Explain capacitor start motor with the help of neat circuit diagram and mention its applications. 5

b) Discuss constructional details and working principle of stepper motor. 5

16. a) Explain various speed control method of dc shunt motor. 6

b) Determine the efficiency of 150 KVA transformer at 50% full load and 0.8 power factor lagging. If the copper loss at full load is 1600w and iron loss is 1400w. 4

17 Write short notes on the following 10

a) Energy stored in an inductor
b) BLDC motor.
c) Mutual inductance.

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Code No: 11072

FACULTY OF ENGINEERING

BE 2/4 (A.E) II-semester (Backlog) Examination, Nov/Dec 2018

Subject : Automotive petrol Engines

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

Note: Answer all questions from part –A and any five Question from Part-B

Part-A (25 Marks)

1 Define the terms a) Volumetric efficiency b) compression ratio

2 Explain the significance of firing order.

3 Draw a neat sketch of simple carburetor

4 Define M.P.F.I what are its advantages

5 What are the requirements of ignition system?

6 What are the factors to be considered while designing a combustion chamber?

7 What is viscosity index. How it is use full while selecting a lubricating oil for an I.C. engine?

8 What are the advantages of Air cooling system over water cooling system

9 What is detonation?

10 List the types of combustion chambers used in S.I. engines

Part-B (50 Marks)

11a) Derive an expression for thermal efficiency of an air standard otto cycle and write the assumptions taken during its derivation 7

b) Draw the value timing diagram of 4 stroke engine 3

12 a) Explain why a simple carburetor cannot meet the various requirements of an engine 5

b) What is petrol injection? What are its advantages & disadvantages? 5

13 a) With a neat sketch explain the working principle of vacuum advance mechanism 5

b) What are the advantages of Electronic ignition system 5

14 a) Explain the phenomena of knocking in S.I. engine 5

b) Define flame front propagation, and on what parameters it depends 5

15 a) Differentiate between wet sump and dry sump lubrication system 5

b) With a neat sketch explain the working principle of thermo siphon cooling system 5

16 a) What are the merits & demerits of 4-stroke over two stroke engines 5

b) Compare S.I. engines with C.I. engines 5

17 Write a short notes on the following 10

a) Battery ignition system

b) Fuel feed systems

c) Stages of Combustion

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Code No: 11077

FACULTY OF ENGINEERING

B.E. 2/4 (I.T) II Semester (Backlog) Examination, November/December 2018

Subject: Signals and Systems

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. Define unit impulse and unit step signals 2
2. Find the even & odd components of u(t) 3
1. How do you obtain exponential Fourier series coefficients from trigonometric Fourier series coefficients? 3
2. Write the conditions for existence of Fourier series. 2
3. Find the Fourier Transform of $x(t) = e^{-3t}.u(t)$ 3
4. Explain the significance of Region of Convergence of Laplace Transform. 2
5. How to overcome aliasing effect? 2
6. Show that 5^{-n}.u(n) is an energy signal. 3
7. Explain Convolution property of Z-Transform 2
10. Find Z-Transform of n.u(n)

PART – B (10x5=50 Marks)

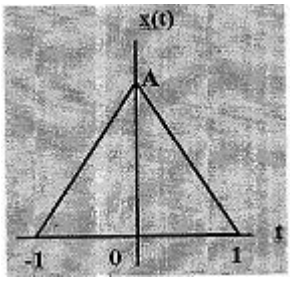
.11. a. For the signal $x(t)$ shown in the figure. Sketch the following

i. $x(t+1)$

ii. $x(t/2-1)$

iii. $x(1-t)$

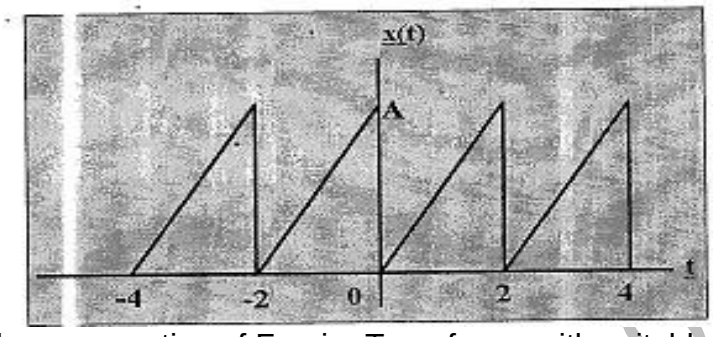
iv. $x(2t)$ 6



b. Check whether the system $y(t) = x(t-2) + e^{x(t)}$ is Linear, Causual & Time-invariant or not 4

Cont..2…

12. Find the cosine & Trigonometric Fourier Series for the signal x(t) shown in figure and sketch magnitude, phase spectra. 10



13. (a) Explain any three properties of Fourier Transforms with suitable examples. 5

(b) Find the inverse Laplace transform of

$$X(s)=\frac{(3S+4)}{(S+1)(S+2)^2}$$ 5

14. Solve the second order linear differential equation

$$\frac{d^2}{dt^2}y(t)+5\frac{d}{dt}y(t)5+6\,y(t)=\frac{d}{dt}x(t)+x(t)$$

For the initial conditions $y(0)=2, \dot{y}(0)=1$ and the input $x(t)=e^{-4t}.u(t)$ 10

15. (a) Determine whether the following discrete time signals are very signals or power signals.

i. $x(n)=u(n)$

ii. $x(n)=\left(\frac{1}{2}\right)^n.u(n)$ 6

(b) Find the DTFS of $x(n)=\cos(\frac{®}{4}n)$ 4

16. (a) Find Z-Transform of the following 5

i. $\cos(\frac{®}{2}n)\,u(n)$ ii. $2^n.u(n)+3^{-n}.u(n-1)$

(b) Find inverse Z- Transform by power series method. 5

$$X(Z)=\frac{z}{2z^2-3z+1} \quad |Z|>1$$

17. Write short notes on

a. Orthogonal Signals 3

b. Anti-aliasing filter 3

c. Properties of DTFT. 4

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