Code No. 3011/S

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) I-Semester (Suppl.) Examination, May / June 2017

Subject : Engineering Materials and Construction

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	What do you understand by the term dressing and polishing of stone?	3
2	What are the specifications of first class bricks?	3
3	Explain the chemical composition of ordinary cement.	3
4	State the advantages and disadvantages of light weight aggregates.	3
5	Describe the use of recycled materials in energy efficient buildings.	3
6	Why steel is used as a reinforcing material in concrete?	2
7	Explain the terms vehicle and solvent.	2
8	Differentiate between hardwood and softwood.	2
9	What are the characteristics of good flooring?	2
10	Draw neat sketches of horseshoe and stilting arches.	2

PART – B (50 Marks)

11	a)	Discuss various methods of quarrying of stones.	5
	b)	Describe the manufacturing process of fly ash bricks.	5
12	a)	Highlight the various types of cement and explain any two of them in brief.	6
	b)	Enumerate the characteristic of good mortar sand.	4
13	a)	Explain the importance of compaction and curing of concrete.	5
	b)	Write a short note on types of reinforcements and their specifications.	5
14	a)	What is varnish? Discuss in detail its applications.	5
	b)	Differentiate between wet rot and dry rot in timber.	5
15	a)	Explain any two types of flooring in detail.	6
	b)	What is the importance of scaffolding? Discuss in detail.	4
16	a)	How do you protect timber from fire? Explain.	4
	b)	Describe the constituents and uses of distemper.	6
17	Write short notes on the following :		
	a)	Workability tests on concrete	4
	b)	White wash	3
	c)	Bulking of sand	3

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Code No. 3015/S

FACULTY OF ENGINEERING

B.E. 2/4 (EEE) I - Semester (Suppl.) Examination, May / June 2017

Subject : Electrical Circuits - I

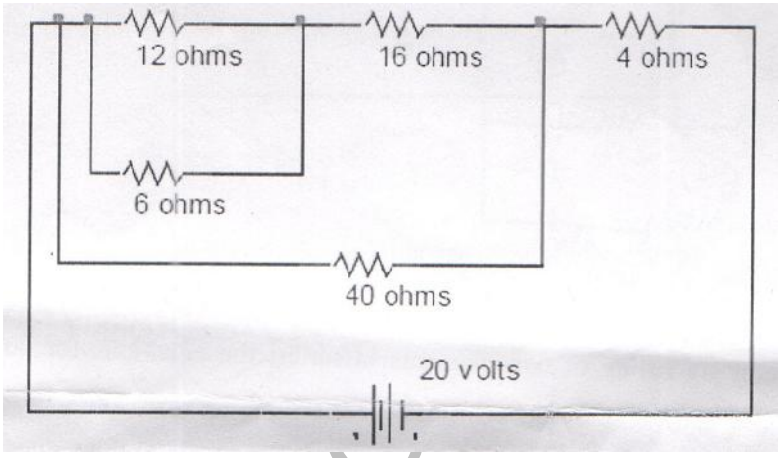
Time : 3 Hours **Max. Marks: 75**

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

PART – A (25 Marks)

1 State Kirchoff's Laws for electric circuits. (2)

2 Calculate the equivalent resistance of the following combination of resistor and source current. (3)



3 A resistance of 120 Ω and a capacitive reactance of 250Ω are connected in series across a AC voltage supply. If a current of 0.9 A is flowing in the circuit find out the power factor. (3)

4 Define Peak factor and form factor and give their significance. (2)

5 Distinguish between balanced and unbalanced loads. (2)

6 In the measurement of three phase power using two wattmeter methods, when both the wattmeter read same values, what is the value of power factor of the load? (3)

7 List the properties of tree of a graph. (3)

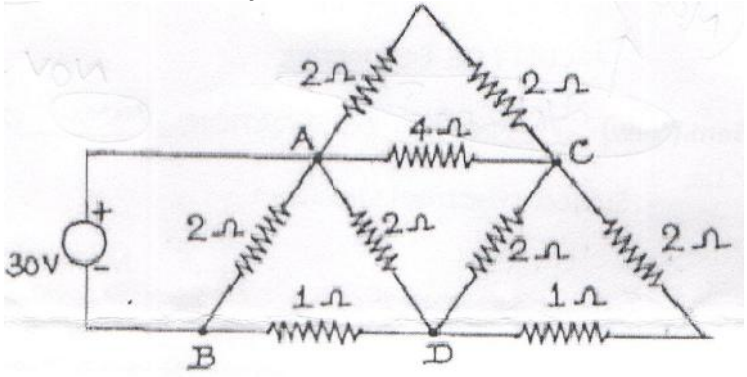
8 State Tellegen's theorem. (2)

9 A Series RLC circuit having L = 100μH and R = 1 kohm is to be tuned to resonate at frequencies ranging from 500kHz to 1 MHz. Calculate the range of adjustment of tuning the capacitor. (3)

10 Define coefficient of coupling and write an expression for mutual inductance in terms of coefficient of coupling. (2)

PART – B (50 Marks)

11 Determine the current delivered by the source shown in the circuit below. (10)



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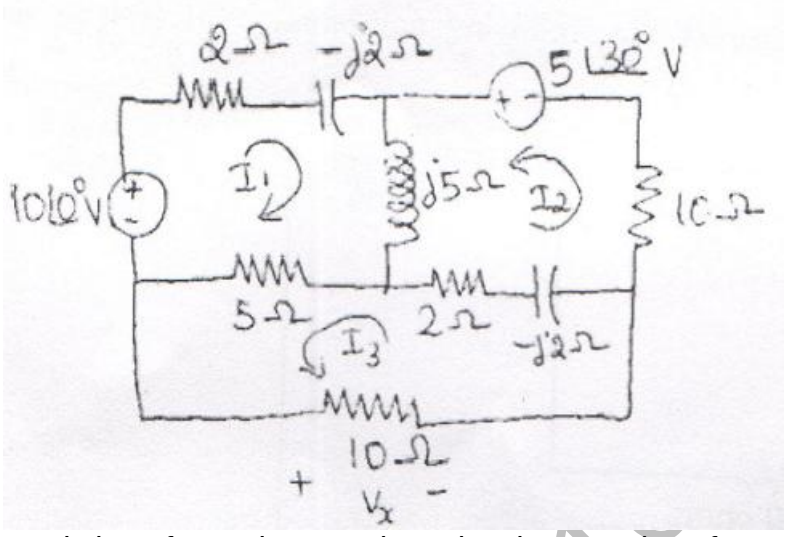
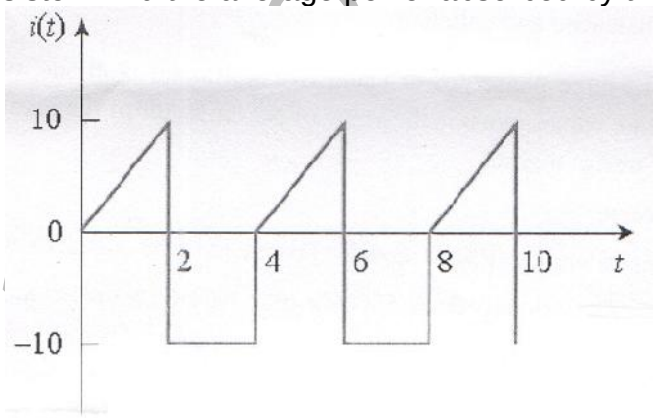
12 Obtain the voltage V_1 using mesh current method for the circuit shown in figure. (10)

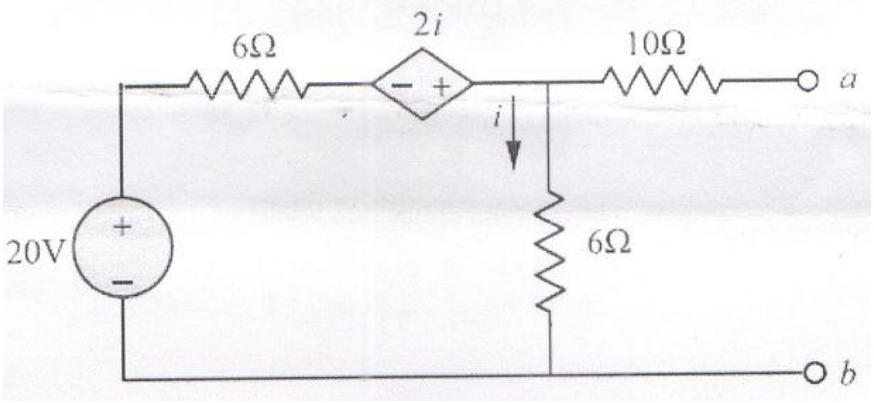


13 (a) In a circuit consisting of two elements in series the equations for voltage and current are i = 28 sin(314 + 60°) and e = 180 sin 314t find (i) the RMS value of the voltage and current (ii) the frequency (iii) the power factor (iv) the power (v) the values of circuit constants. 5

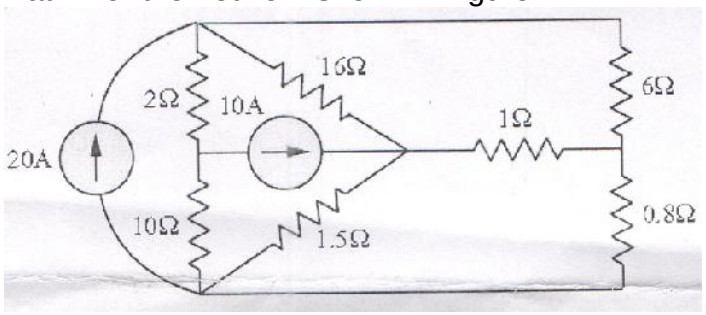
(b) Determine the rms value of the current waveform in figure. If this current is passed through a 2Ω resistor. Find the average power absorbed by the resistor. 5



14 (a) Find the Thevenin's equivalent for the circuit shown in figure with respect to terminals ab. (5)



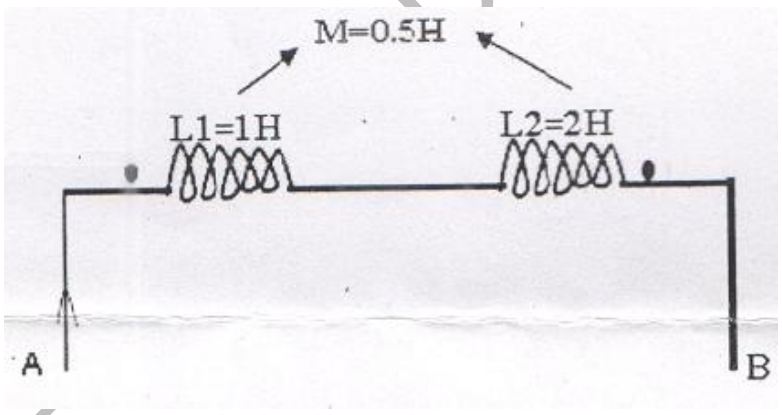
(b) Write the Tie set matrix for the network shown in figure. (5)



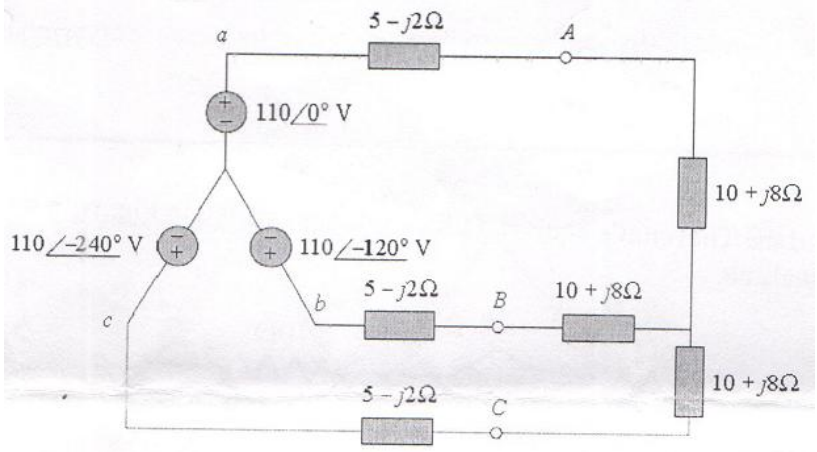
15 (a) Two coils, one of R_1=0.51Ω, L_1 = 32mH, the other of R_2=1.3 Ω and L_2= 15 mH and two capacitors of 25 μF and 62 μF are all in series with a resistance of 0.24Ω. Determine the following for this circuit.

(i) Resonance frequency
(ii) Q of each coil
(i) Q of the circuit
(ii) Cut off frequencies
(v) Power dissipated at resonance if E = 10 V. (7)

(b) For the circuit shown, find the voltage across the terminals A and B if the current changes at the rate of 100 A /s. (3)



16 (a) Calculate the line currents in the three wire Y-Y system. (7)



(b) Draw the phasor diagram of a 3 phase balanced delta connected load. (3)

17 Write short notes on the following: (10)

(a) Current locus diagram
(b) Milliman's Theorem

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Code No. 3020/S

FACULTY OF ENGINEERING

B.E. 2/4 (Inst.) I - Semester (Suppl.) Examination, May / June 2017

Subject : Network Theory

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

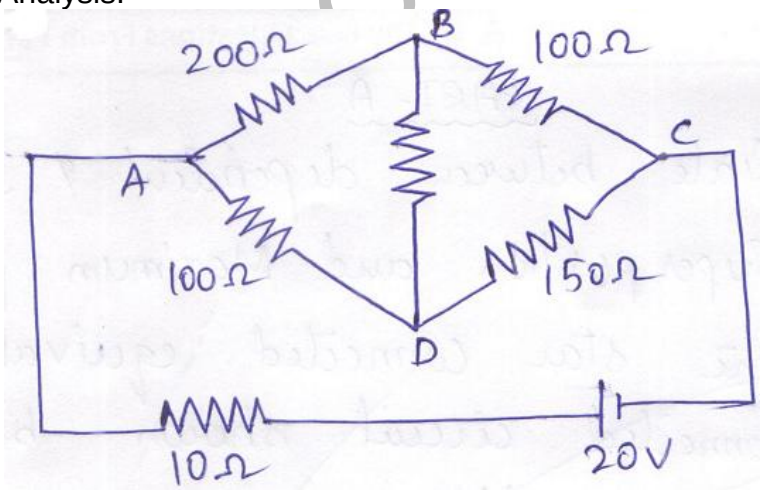
Note: Answer all questions from Part-A and answer any five questions from Part-B.

PART – A (25 Marks)

1	Differentiate between dependent and independent sources.	(3)
2	State Super position theorem.	(2)
3	What is Duality? Explain.	(2)
4	Differentiate between transient response and steady state response.	(3)
5	Define Resonance and Quality factor.	(2)
6	Derive energy started expression for 'L'.	(3)
7	Write the generalized expressions for H-Parameters of a two port network.	(3)
8	Write the expressions for impedance parameters of a two port network.	(2)
9	Define RMS Value.	(2)
10	Differentiate between Active and Reactive power.	(3)

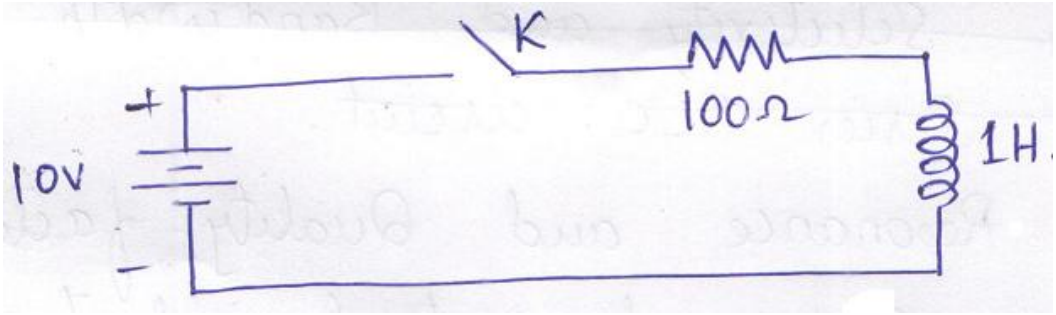
PART – B (50 Marks)

11 For the bridge circuit given in the figure, find the current through 10Ω resistor across BD by using Mesh Analysis.



12 (a) Derive the expression for i(+) in a series RC-circuit which is excited with a DC voltage source 'V', when the switch is closed at t = 0.

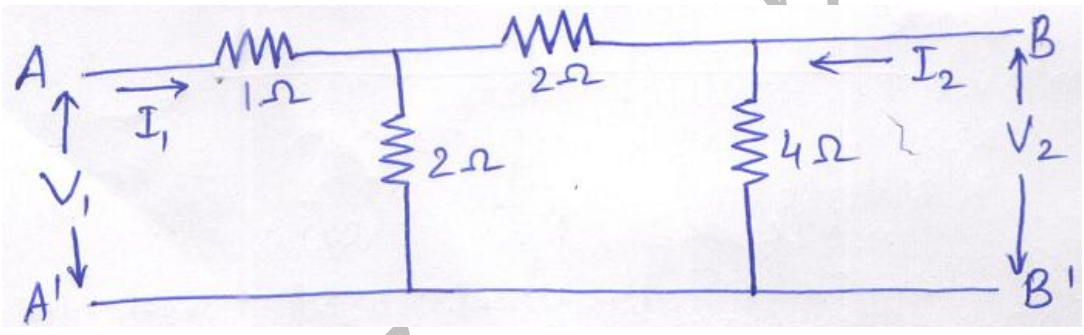
(b) The switch 'K' is closed at t = 0, for the circuit shown below. Find the values of I, di/dt and d^2i/dt^2 at t = 0.



13 (a) The equation of an alternating current is given by I = 141.4 sin 314t. Find
   (i) RMS value of current
   (ii) Frequency and
   (iii) Instantaneous values of current when t is 3.6msec
   (b) Discuss about RLC network.

14 (a) Derive the equation for Resonant frequency of a series RLC circuit.
   (b) Two coils connected in series have an equivalent inductance of 0.4H when they are connected in aiding and equivalent inductance of 0.2H when connected in opposition. Calculate Mutual inductance.

15 Find the Y parameters for the network shown in the below figure.



16 (a) Discuss about star-delta transformation.
   (b) Explain about response of R, RL Network subject to standard tort test signal.

17 Write short notes on the following: (10)
   (a) Classification of Network elements
   (b) Three phase wattmeter method

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Code No. 3022/S

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I - Semester (Suppl.) Examination, May / June 2017

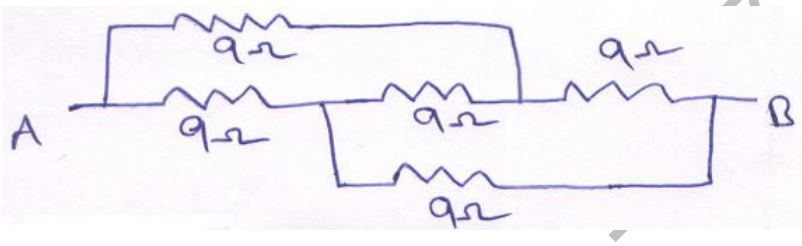
Subject : Basic Circuit Analysis

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

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

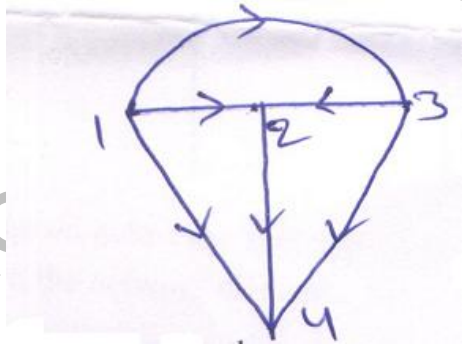
PART – A (25 Marks)

1 Find equivalent resistance between A and B. (5)

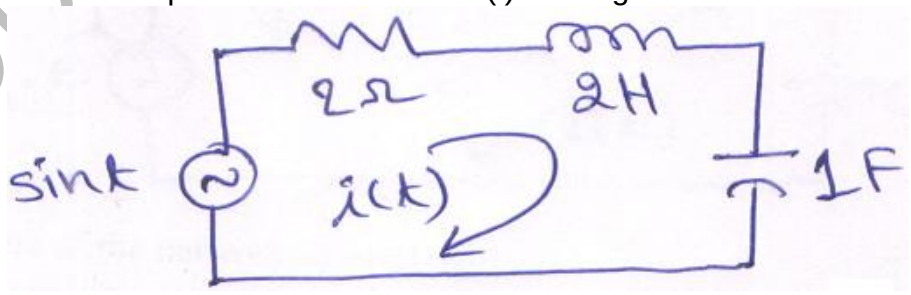


2 Derive condition for reciprocity and symmetry of a two port network in terms of ABCD parameters. (5)

3 Find complete incidence matrix of linear graph shown below. (4)



4 Find the differential equation for the current i(t) in the given circuit. (4)



5 An a.c. single $v(t) = V_m \sin wt$ is applied to a series R-L circuit. Find reactive power, active power, apparent power, power factor of the circuit. (4)

6 A coil of 20 Ω resistance has an inductance of 0.2H and is connected in parallel with a condenser of 100μF capacitance. Find resonant frequency. (3)

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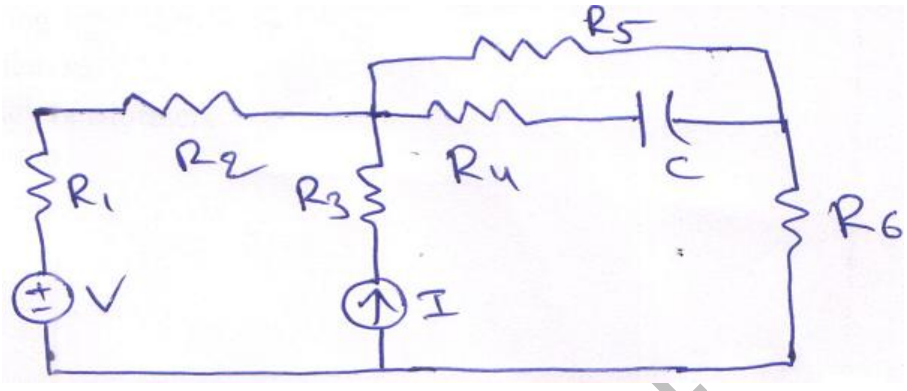
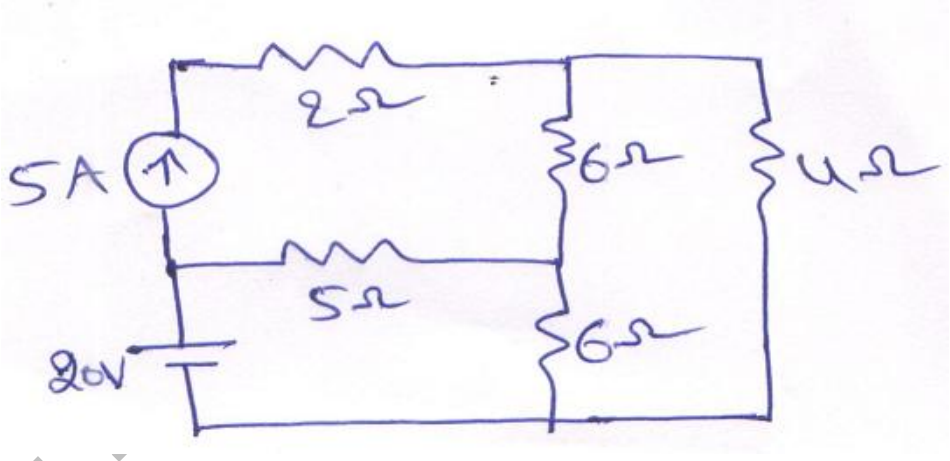
PART – B (50 Marks)

7 For the circuit shown in figure, draw the oriented graph and write the (10)
(a) Incidence matrix (b) tie-set matrix (c) f-cut set matrix

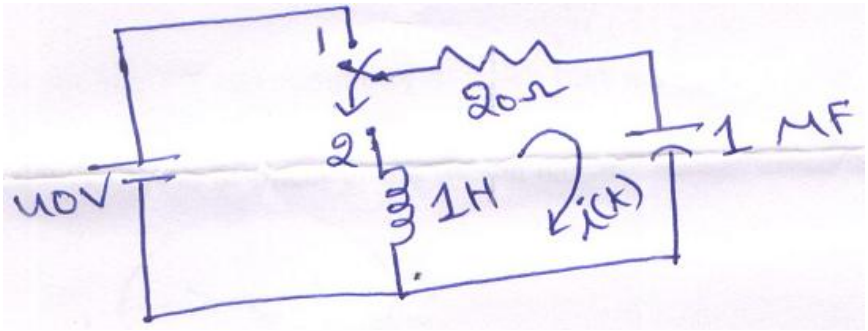


8 (a) Find the current flowing through 4Ω resistor in the given network by using super position theorem. (7)

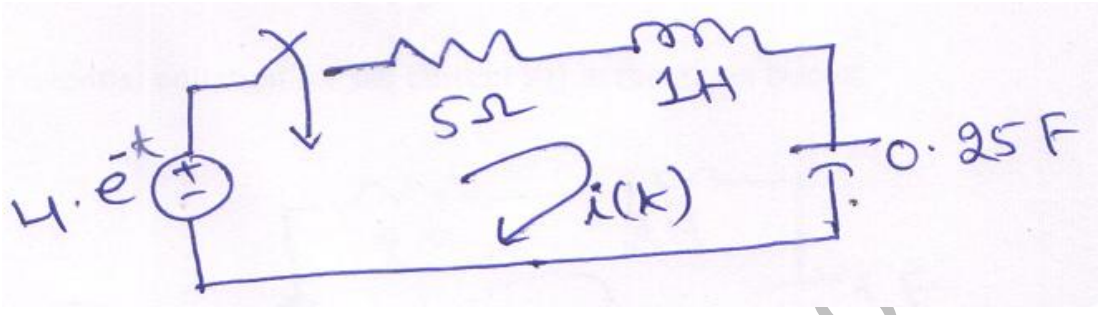


(b) State and explain Tellegen's theorem and maximum power transfer theorem. (3)

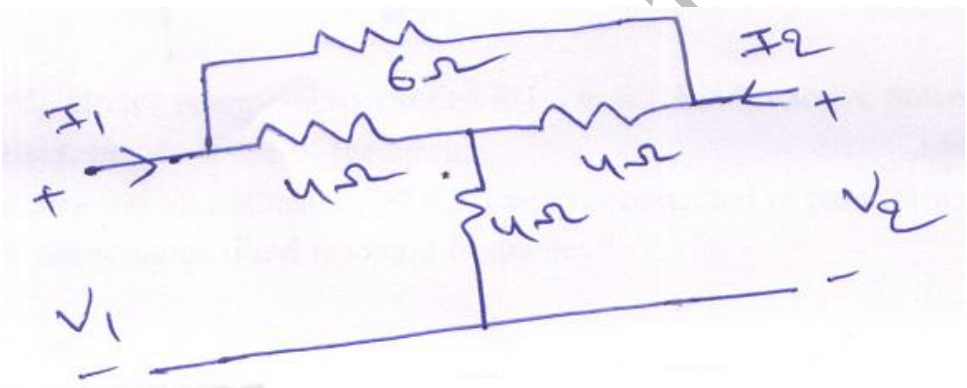
9 In the given network the switch position is changed from position 1 to the position 2 at t=0, find the value of $i(t), \frac{di)t)}{dt}, \frac{d^2(t)}{dt^2}$ at t = 0^+. (10)



10 For the network shown below the switch is closed at t = 0, determine current i(t) assuming zero initial conditions in the network elements. (10)



11 Find Y-parameters of the network shown below: (10)



12 Determine the expression for resonant frequency, quality factor, bandwidth for a series RLC circuit when the input signal is $V(t)=V_m \sin wt$. (10)

17 Explain the following:

(a) Pole-zero cancellation (4)

(b) Practical and ideal transformers (3)

(c) Reciprocity theorem (3)

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Code No. 3028/S

FACULTY OF ENGINEERING

B.E. 2/4 (M / P / A.E) I – Semester (Suppl.) Examination, May / June 2017

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 What are the different types of materials?
2 What is Hall-Petch equation?
3 What is cumulative fatigue?
4 Mention the applications of diffusion theory in mechanical engineering.
5 Define phase diagram.
6 Write effect of nickel on steel.
7 What are the differences between hardening and tempering?
8 What are the characteristics of plain carbon steels?
9 what are the different zones in cupola?
10 Mention the application of powder metallurgy.

PART – B (5x10 = 50 Marks)

11 a) What is critical resolved shear stress? Explain.
b) Explain with neat sketches the different types of crystal structure.

12 a) What are the effects of metallurgical variables on fatigue of metal? Explain.
b) Explain Fick's laws of diffusion.

13 a) Explain the properties and characteristics of cast iron.
b) Draw iron-iron carbide diagram and label all phases.

14 What is surface hardening? Explain in detail various surface hardening methods.

15 a) Explain method of production pig iron with neat diagram.
b) Explain Bessemer converter process with neat diagram.

16 a) What is age hardening? Describe different steps in age hardening?
b) Explain recovery, recrystallization and grain growth.

17 Write a short note on the following:
a) Effects of alloying elements on steels
b) Creep curve
c) Electric slag refining.

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Code No. 3035/S

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) I - Semester (Suppl.) Examination, May / June 2017

Subject : Discrete Structures

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

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

PART – A (25 Marks)

1 Convert *All Apple are not red" to a symbolic form. (2)

2 Show that $(A \cap B) \cup C = (A \cup C) \cap (B \cup C)$ using Laws of Set theory. (3)

3 Give an example of a relation which is neither reflexive nor irreflexive for a set given as A = [1, 2, 3]. (3)

4 What is a Surjective Function? Give an example. (2)

5 Find the co-efficient of x^{15} in $(x^3 + x^4 + x^5 + \ldots\ldots\ldots\ldots)^5$. (3)

6 Find a sequence for the generating function $1/(1-4x)^n$. (2)

7 What is a Coset leader? Give an example. (3)

8 Define Monoid Homomorphism. (2)

9 Find the degree of K_3. (2)

10 Differentiate Sub graph and Spanning graph. (3)

PART – B (50 Marks)

11 (a) Prove the following statement by using mathematical induction.

$1^2+3^2+5^2+\ldots..+(2n-1)^2=(n)(2n-1)(2n+1)/3$

(b) Show that the inference is valid for the given set of premises.

P1 : All integers are rotational numbers.

P2 : Some integers are power of 3

C : Therefore, some rational numbers are power of 3

12 Given S = {1….10} and a relation R on S where

R = {< x, y> | x + y = 10} . What are the properties of the relation R?

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

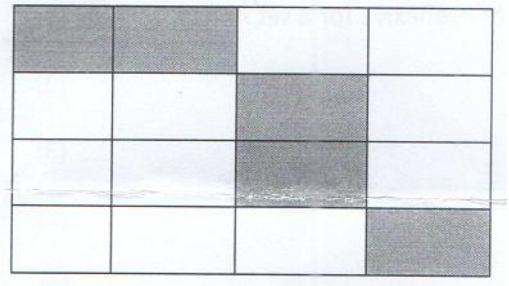
14 (a) Prove that <Q+, *> where * is a binary operation defined by a * b=ab/5 is a Group.

(b) Show that the intersection of two congruence relation is a congruence relation.

15 Use Grinberg's theorem to show that Paterson Graph does not have a Hamiltonian Cycle.

16 (a) Show that Bipartite graph is Bi colorable.

(b) Find the rook polynomial for the shaded board?



17 Write short notes on the following:

(a) For moduli $m_1=8$, $m_2=3$, $m_3=5$, find the number whose residue representation is <4, 2, 3> without the use of mixed based arithmetic's.

(b) Obtain Recurrence relation for the closed form

$A(K)=K^2-K$

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Code No. 3041/S

FACULTY OF INFORMATICS

B.E. 2/4 (IT) I - Semester (Suppl.) Examination, May / June 2017

Subject : Digital Electronics and Logic Design

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

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

1 Write VHDL code for the expression
$f = (x_1^1 + x_3)(x_4 + x_2^1)$. (3)

2 List the different stages of CAD Tools. (2)

3 Write the Shannon's expansion theorem. (3)

4 Differentiate between PLA and PAL. (2)

5 What is meant by edge triggered and level-sensitive ? (2)

6 Why S=R=1 condition is not permitted in the SR Flip-flop? (2)

7 Differentiate between Moore and Mealy machines. (3)

8 What are the different types of hazards? (2)

9 What are the elements of ASM Charts? (3)

10 What is a Priority encoder? Give the truth table for 4-to-2 priority encoder. (3)

PART – B (50 Marks)

11 (a) Minimize the following expression using K maps method.
f(a,b,c,d)=Σm(0,2,8,9,10,15) + D(1,3,6,7) (5)
(b) Check the validity of the logic equation
$x_1x_3^1 + x_2^1x_3^1 + x_1x_3 + x_2^1x_3 = x_1^1x_2^1 + x_1x_2 + x_1x_2^1$ (5)

12 (a) With a neat block diagram explain the FPGA architecture. (5)
(b) Construct 8:1 Multiplexer using 4:1 multiplexer and 2:1 multiplexer units. (5)

13 Design a mod-8 asynchronous up counter using neat timing diagram. (10)

14 Explain the design of a counter using sequential circuit approach. (10)

15 Explain about analysis of asynchronous sequential circuits using an example. (10)

16 (a) Design a T flip-flop and D flip-flop using SR flip-flop. Write the steps involved in the process. (8)
(b) Differentiate between combinational & sequential circuits. (2)

17 Write short notes on:
(i) Johnson Counter (5)
(ii) State reduction (5)

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