Code No. 3011

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I - Semester (Main) Examination, December 2016

Subject : Engineering Materials and Construction

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	List out the various uses of stones as a building material.	(3)
2	What is a Tempering?	(2)
3	Define Load bearing and Non Load bearing blocks.	(2)
4	What is bulking of sand?	(3)
5	What are the uses of Blended cement?	(3)
6	What is the chemical composition of cement?	(3)
7	What are recycled materials?	(3)
8	What is pointing?	(2)
9	Define Varnish.	(2)
10	What are the different types of scaffolding?	(2)

PART – B (50 Marks)

11	(a) Explain in detail the various classifications of stones.	(5)
	(b) Discuss the various characteristics of building stones.	(5)
12	(a) Explain the process of burning of bricks in Bull's Trench kiln with a neat sketch.	(6)
	(b) What is a Pug mill? Draw a newt sketch.	(4)
13	Explain in detail the manufacturing process of cement by wet process.	(10)
14	(a) What are the different tests on aggregates?	(6)
	(b) What are Light weight aggregates?	(4)
15	(a) What are the different methods of preserving timber? Why is it necessary to preserve timber?	(6)
	(b) What are the various types of timber?	(4)
16	(a) What are the different types of floors?	(5)
	(b) What are the characteristics of good floors?	(5)
17	Write short notes on :	
	(a) Types of reinforcement.	(3)
	(b) Laminates and their uses.	(4)
	(c) IS : 269 specifications for OPC.	(3)

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Code No. 3015

FACULTY OF ENGINEERING

B.E. 2/4 (EEE) I - Semester (Main) Examination, December 2016

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.

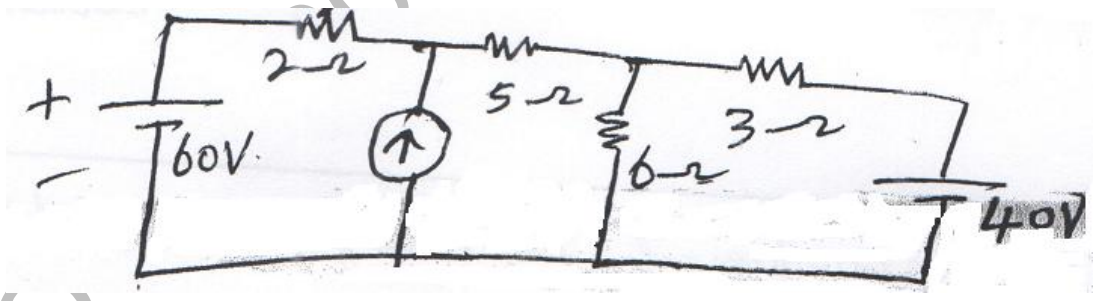
PART – A (25 Marks)

1 Define Active and Passive elements. (2)
2 State KVL and KCL. (3)
3 State Reciprocity theorem. (2)
4 Define resonance, band width and Q-factor. (3)
5 Define Average value and Rm's values. (2)
6 Draw phasor diagram of RLC circuit when $WL < \frac{1}{WC}$. (3)
7 Distinguish Reactive power and Real power. (2)
8 Discuss cut set and Tie set. (3)
9 Define coefficient of coupling. (2)
10 Discuss advantages of three phase system. (3)

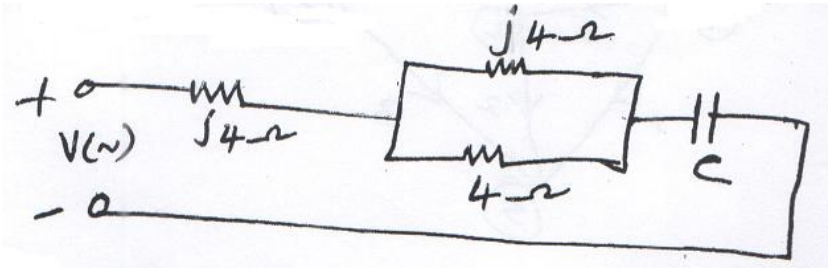
PART – B (50 Marks)

11 Discuss the analysis of circuits with mutual inductance. (10)

12 Find current through branch a-b using mesh analysis shown in the circuit below. (10)



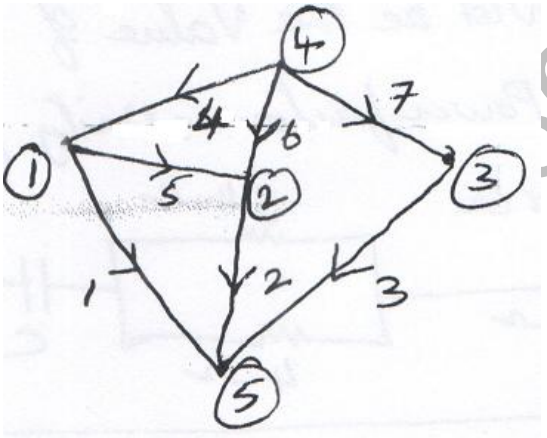
13 (a) What should be the value of 'C' such that the point power factor is unity for any frequency 'f' of the source? (5)



(b) Discuss steady state response of series and parallel circuits. (5)

14 A 3 - ϕ delta connected load has Z_{ab} = (100+j0)Ω, Z_{bc}=(-j100)Ω, Z_{ca}=(70.7+j70.7)Ω is connected to balanced 3 - ϕ 400V supply. Determine line current I_a, I_b, I_c,. Assume phase sequence abc. (10)

15 Obtain fundamental loop and fundamental cut set matrices for the graph shown below: (10)



16 (a) Discuss about balanced and unbalanced three phase circuits. (5)
(b) Explain current locus diagram of RC series circuit. (5)

17 (a) Write short notes on maximum power transfer theorem. (5)
(b) Explain Star-delta transformations. (5)

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Code No. 3020

FACULTY OF ENGINEERING

B.E. 2/4 (Inst.) I - Semester (Main) Examination, December 2016

Subject : Network Theory

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

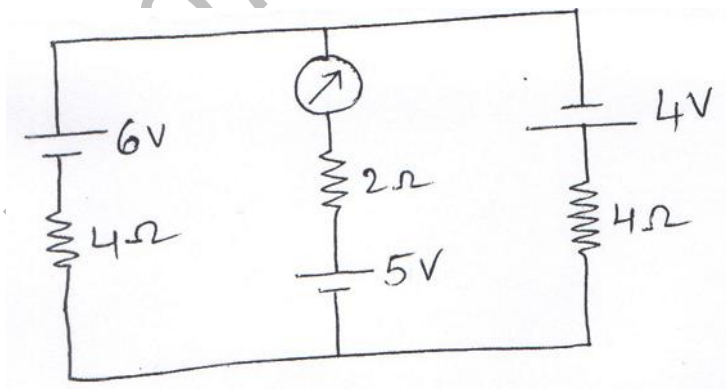
Note: Answer all questions from Part-A and answer any five questions from Part-B.

PART – A (25 Marks)

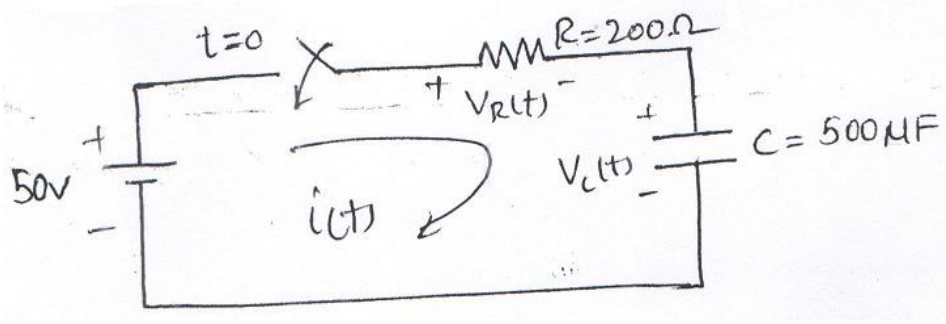
1 What are Active and Passive elements? (2)
2 State Thevenin's and Norton's theorems. (3)
3 Explain the initial conditions for Inductor and capacitor. (2)
4 What is the differential equation of an electric current containing resistance 'R' and a capacitor 'C' in series with voltage source 'V'? (3)
5 Define Average and RMS values for periodic time function. (3)
6 Define impulse and Ramp response of networks. (2)
7 Define Resonance.
8 Define self and mutual inductances.
9 What is admittance? (2)
10 Discuss about hybrid parameters. (3)

PART – B (50 Marks)

11 (a) Explain the steps involved in a thevenin's circuit?
(b) Using thevenin's theorem, find the current in the ammeter shown in the figure.



12 In the RC, circuit of given figure, the switch is closed at t = 0. Find the current i(t) and the voltage across resistance and capacitance.



13 (a) Discuss about Series parallel network.
(b) Explain steady state response of RL circuit.

14 (a) With neat diagram, explain the method of 3-phase power measurement by two watt meter method.
(b) A balanced 3-phase load takes 10kW at a power factor of 0.9 lagging. Calculate the reading on e ach of the two watt meters connected to read input power.

15 Z-parameters of a two port-network are $Z_{11}=20\Omega$, $Z_{22}=30\Omega$; $Z_{12} = Z_{21} = 10\Omega$, find its equivalent T-network and Y-network.

16 Write short notes on :
(a) Maximum power transfer theorem and
(b) Interconnection of two ports

17 (a) Discuss about transient and steady state response.
(b) Explain the generation of three phase voltages.

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Code No. 3022

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I – Semester (New) (Main) Examination, December 2016

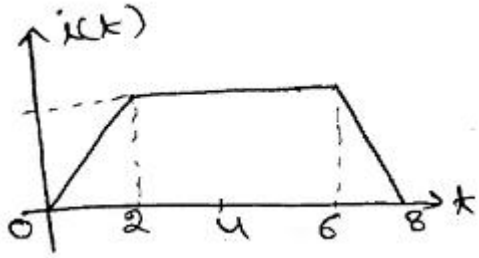
Subject: Basic Circuit Analysis

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

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

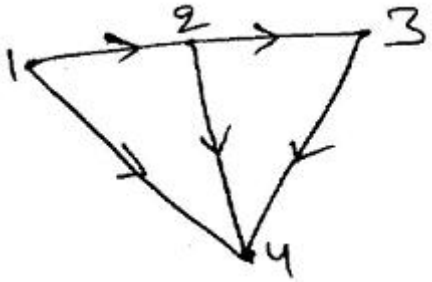
PART – A (25 Marks)

1 A current waveform is applied to a 2H inductor. Draw voltage waveform for the given figure. 5

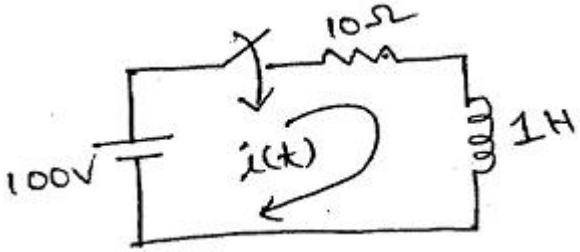


2 Find Y-parameters of a ® – network. 5

3 The given figure shows a graph of the network. Show all the trees of this graph. 4



4 In the given network switch is closed at t=0 with zero initial current in the inductor, find $i(t) = \frac{di(t)}{dt}$ at $t=0^+$. 3



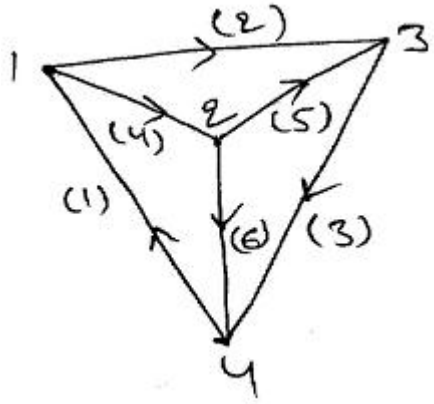
5 A series circuit consumes 2000 W at 0.5 leading power factor, when connected to 230 V, 50 Hz a.c supply. Calculate: 4
   a) Current
   b) Apparent power
   c) Reactive power

6 A series RLC circuit has the following parameter values R=10 Ω, L=0.01H, C=100 μF. Compute resonant frequency, bandwidth, lower and upper frequency of the bandwidth. 4

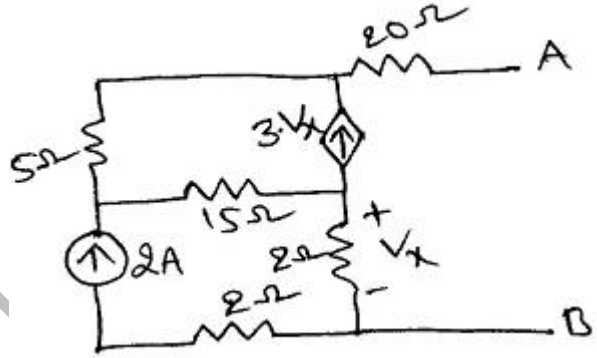
..2

PART – B (5x10 = 50 Marks)

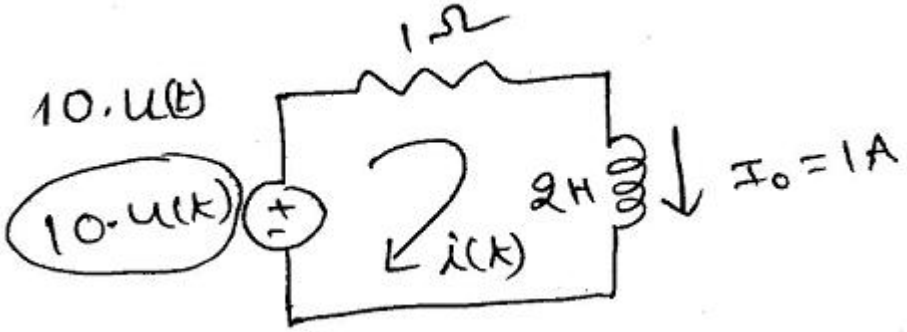
7 The graph of a network is shown below. Write the (a) incidence matrix (b) tieset matrix (c) f-cutset matric. 10



8 Find Norton's equivalent network across A and B. 10

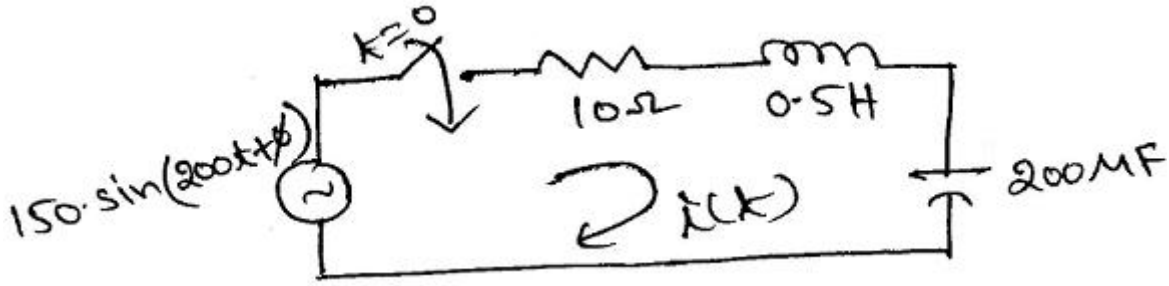


9 Find zero input response, zero state response and complete response of the network shown below. 10

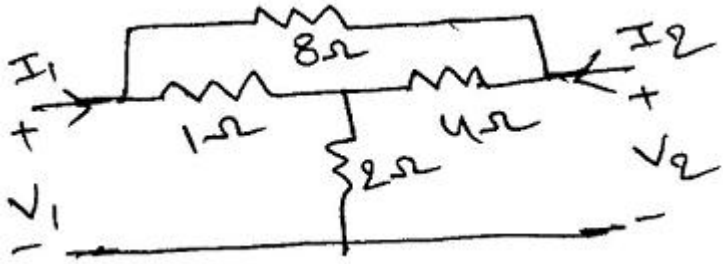


..3

10 For the given network a sinusoidal voltage V = 150 sin(200t + ¤) is applied at ¤ =30^{o} determine current i(t). 10



11 Find the equivalent T-network for the network shown below. 10



12 A coil having a resistance of 20Ω and inductance of 200μH is connected in parallel with a variable capacitor. This parallel combination is connected in series with a resistance of 8000Ω. A voltage of 230 V, 10^{6} Hz is applied across the circuit find 10

a) The value of capacitance at resonance
b) Q factor of the circuit
c) Dynamic impedance of the circuit
d) Total circuit current.

13 Explain the following:

a) Kirchhoff's laws 3

b) Magnetically coupled circuits 3

c) Impedance and admittance functions 4

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Code No. 3028

FACULTY OF ENGINEERING

B.E. 2/4 (M/P/A.E. I – Semester (New) (Main) Examination, December 2016

Subject : Metallurgy and Material Science

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 What is polycrystalline and how it is different from single crystal?
2 What are the different imperfections in crystals?
3 What is meant by the term 'fatigue limit'?
4 With a neat sketch explain the three stages of creep.
5 Explain Gibb's phase rule.
6 State Fick's first law of diffusion.
7 What is the purpose of heat treatment and how it is different from alloying?
8 What do you get from the construction and interpretation of T.T.T. curves?
9 Draw a neat sketch of blast furnace.
10 What are the different types of stainless steels?

PART – B (50 Marks)

11 (a) Differentiate between edge and screw dislocation.
(b) Discuss Griffiths theory of brittle fracture.

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

13 (a) Classify plain carbon steels. Explain the effect of carbon on the properties of plain carbon steels.
(b) Explain the construction of phase diagram of lead (Pb) and tin (Sn) system with neat sketch.

14 (a) Explain the working principle of induction furnace for steel making.
(b) Differentiate between carburizing and nitriding.

15 (a) Distinguish between white cast iron and malleable cast.
(b) Explain method of production of steel by 'L.D. process'.

16 (a) Draw iron-iron carbide diagram and label all points, lines and areas.
(b) Discuss the effects of alloying elements on plain carbon steels.

17 Write short notes on the following:
(a) Maraging steels
(b) Ductile fracture
(c) Chilled cast iron

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Code No. 3035

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) I – Semester (New) (Main) Examination, December 2016

Subject: Discrete Structures

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 Obtain contra positive and inverse for the statement. It it is dark then it is night. 2

2 Show the implication P, $(P \rightarrow Q) \Rightarrow Q$ 3

3 Let f be the function from {a, b, c, d} to {1, 2, 3, 4} with f(a) = 4, f(b) = 2, f(c) = 1 and f(d) = 3. Is f a bijective function? How. 3

4 Give an example for antisymmetric relation. 2

5 Generate the sequence for the recurrence relation $a_n = a_{n-1} + 1$, $n \geq 1$ where $a_o = 3$. 3

6 Find the co-efficient of x^5 in $(1-2x)^{-7}$. 2

7 Obtain a multiplication table for a monoid using binary operation $*$ on set A = {a, b}. 3

8 Define monoid and semi group. 2

9 Find the chromatic number of a wheel graph. 2

10 Draw a complement of complete bipartite graph $K_{3,3}$. 3

PART – B (5x10 = 50 Marks)

11 Show that from the set of premises

a) $(\exists x)(F(x) \cap S(x)) \rightarrow (\forall y)(M(y) \rightarrow W(y))$

b) $(\exists y)(M(y) \cap \neg W(y))$

The conclusion is $(\forall x)(F(x) \rightarrow \neg S(x))$

12 Determine the number of positive integer n, $1 \leq n \leq 1000$ that are non divisible by 3,5,7 but are divisible by 9.

13 Solve the following non-homogeneous recurrence relation using characteristic roots method.

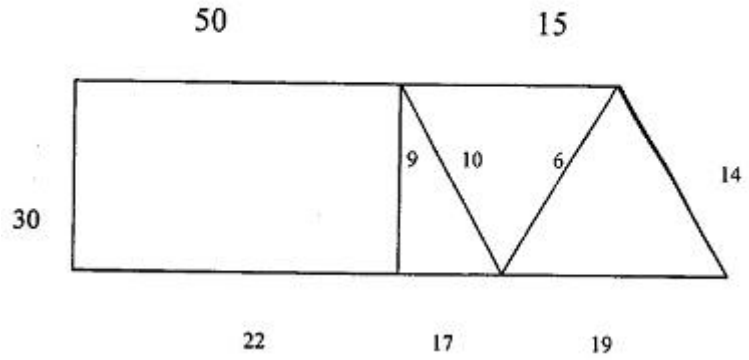
$A_n - 5a_{n-1} + 6a_{n-2} = 2^n$ for $n \geq 2$, $a_o = 1$ and $a_1 = 3$.

14 Devise a single error correcting group code and associated decoding table for m=3 and n=7.

…2.

15 Find Minimum Spanning Tree using Prim's algorithm for the graph shown in Figure 1.

Figure 1(Question No.15)



16 a) Let f: A $\rightarrow$ B and g: B $\rightarrow$ C be any two functions. Then prove the following statements:

i) If f and g are one to one then gof is one to one.

ii) If f and g are onto then gof is onto.

b) Obtain a Hasse diagram for R = {(a, b)} such that (a, bϵN) and <aRb> iff a $\leq$ b}.

17 a) Partition of integers

b) Find a Hamiltonian cycle for octahedron graph.

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Code No. 3041

FACULTY OF INFORMATICS

B.E. 2/4 (IT) I - Semester (Main) Examination, November / December 2016

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.

PART – A (25 Marks)

1 Define Min- term & Max-term? (2)
2 Demonstrate by means of truth table the validity of identity x+yz=(x+y)(x+z). (3)
3 Differentiate between CPLD and FPGA. (3)
4 What is a decoder? Give an example. (2)
5 Give the functionality of gated S R Latch. (2)
6 Write VHDL Code for D flipflop. (3)
7 What are the basic design steps in design of synchronous sequential circuits? (3)
8 Define Setup and hold time of flip-flop. (2)
9 Distinguish between combinational and sequential circuits. (3)
10 What is Shift register? How many flip-flops are needed to implement an n-bit shift register? (2)

PART – B (50 Marks)

11 (a) Find minimum cost POS form and draw circuit using NAND gates only for the expression f(x_1, x_2, x_3)= Σm(2,3,5,6,7,10,11,13,14) (7)
(b) Find the complement of f=(x+y'+z)(x'+z')(x+y). (3)

12 (a) Give the general structure of PLA. Realize the following function using PLA (7)
i. $F_1 = x_1\ x_2^1 + x_3 + x_1^1\ x_2^1\ x_3$
ii. $F_2 = x_1^1\ x_2^1\ x_3 + x_1 x_2^1\ x_3\ x_4^1$
The PLA should have inputs x_1,.,x_4, product terms P_1,….,P_4 & output terms F_1 & F_2
(b) Design a 1 bit comparator circuit. (3)

13 (a) With a neat diagram. Explain the operation of parallel access shift register. (6)
(b) Convert the T Flip-flop to J K Flip-flop. (4)

14 What is state minimization? How do you identify the equivalent states? Minimize the given state table using the partitioning procedure. (10)

Present state	Next state		Output
	w=0	w=1	z
A	B	C	1
B	D	F	1
C	F	E	0
D	B	G	1
E	F	C	0
F	E	D	0
G	F	G	0

15 (a) Explain the state assignment problem with an example. (7)
(b) Differentiate between Static and Dynamic hazards. (3)

16 (a) What is a Macro cell? Give the significance of macro cell in CPLD Architecture. (5)
(b) Explain the operation of Master Slave edge triggered flip-flop. (5)

17 Write short notes on: (5+5)
(i) ASM charts (ii) CAD Tools

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