Code No. 11395/CBCS

# FACULTY OF ENGINEERING

## B.E. (Civil) III - Semester (CBCS) (Suppl.) Examination, May/June 2019

**Subject : Building Materials and Construction**

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

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

### PART – A (20 Marks)

| | | |
|---|---|---|
| 1 | What are the various uses of stone? | (2) |
| 2 | How trees are classified ? | (2) |
| 3 | What is tempering? | (2) |
| 4 | What are the various types of mortar? | (2) |
| 5 | What is the purpose of testing of cement? | (2) |
| 6 | List out the various green building materials. | (2) |
| 7 | What are the constituents of paints? | (2) |
| 8 | What are the different types of fire? | (2) |
| 9 | What is formwork? | (2) |
| 10 | What are the different cracks in building? | (2) |

### PART-B (50 Marks)

| | | |
|---|---|---|
| 11 | (a) What are the various methods of manufacturing of bricks? | (5) |
| | (b) Explain the various defects in timber? | (5) |
| 12 | (a) What are the various types of cement? | (5) |
| | (b) What are the different test on coarse and fine aggregate ? | (5) |
| 13 | (a) What are the various steps involved in manufacturing of a design mix concrete? | (5) |
| | (b) What are the different uses of recycled materials? | (5) |
| 14 | (a) Explain the methods of plastering process. | (5) |
| | (b) What is a distemper mention its types and application? | (5) |
| 15 | (a) What is a formwork? Mention the different type of material used in formwork. | (5) |
| | (b) Explain with a neat sketch the various type of scaffolding. | (5) |
| 16 | (a) What are the different causes of fires and mention the methods of detection? | (5) |
| | (b) What are the various methods of damp proofing in buildings? | (5) |
| 17 | (a) What is the difference between expansion joint and contraction joint? | (5) |
| | (b) Explain the various types of cracks in buildings and their principal cause. | (5) |

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**Code No. 11401/CBCS**

# FACULTY OF ENGINEERING

## B.E. (EE/Inst.) (CBCS) III–Semester (Suppl.) Examination, May 2019

**Subject: Digital Electronics & Logic Design**

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

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

### PART - A (20 Marks)

1. Define Minterms & Maxterms. 2 M
2. Determine the Gray code equivalent of $(10011)_2$ and the binary equivalent of the Gray code number 110011. 3 M
3. Briefly describe the operation of CMOS NAND 2 M
4. Add and multiply the following numbers without converting them to decimal. (a) Binary numbers 1011 and 101. 2 M
5. Why is it not recommended to leave unused logic inputs floating? What should we do to such inputs in the case of TTL and CMOS logic gates? 2 M
6. Mention the difference between a DEMUX and MUX. 2 M
7. State the advantage and disadvantage of a totem-pole output.. 2 M
8. An eight-bit binary ripple UP counter with a modulus of 256 is holding the count 01111111. What will be the count after 135 clock pulses? 2 M
9. An eight-bit D/A converter has a step size of 20 mV. Determine the full-scale output and percentage resolution. 3 M

### PART - B (50 Marks)

10 Simplify using K-map F (A,B,C,D) = $\sum$ m(0,2,4,5,6,8,10,15).Implement the Reduced function using NAND gate only. 10M

11. (a) Draw the circuit diagram and explain the operation of ECL OR/NOR gate. 5 M
    (b) Design a 32:1 multiplexer using two 16:1 and 2:1 multiplexers. 5 M
12. (a) Design a 4 bit BCD to Excess-3 decoder and relize the circuit. 5 M
    (b) Construct a 4-to-16 line decoder with two 3-to-8 line decoders having active LOW ENABLE inputs. 5 M
13. Describe with the help of a schematic diagram the principle of operation of a successive approximation type A/D converter. Explain the sequence of operation of conversion of an analogue signal to its digital equivalent when the expected digital output is 1010. 10 M
14. Briefly describe the principle of operation of a simultaneous or flashtype A/D converter. What are the merits and demerits of this type of converter? How does the architecture of a flash converter differ from that of a half-flash converter? 10 M
15. (a) Draw the circuit diagram and explain the operation of 2 input TTL NAND gate with Totem-pole output. 5 M
    (b) With neat diagram explain in detail about binary Ladder Network for D/A Conversion. 5 M
16. (a) Design and explain the working of half adder and Full subtractor. 4 M
    (b) Simplify the following boolean functions using the QuineMcCluskey tabulation method: f(A, B, C, D, E, F, G) = $\sum$ (20, 21, 28, 29, 52, 53, 60, 61). 6 M

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Code No. 11408/CBCS

# FACULTY OF ENGINEERING

## B.E. III-Semester (CBCS) (Suppl.) Examination, May 2019

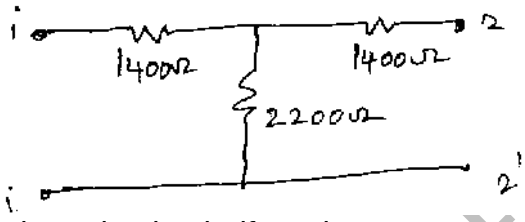
**Subject : Network Analysis and Synthesis**

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

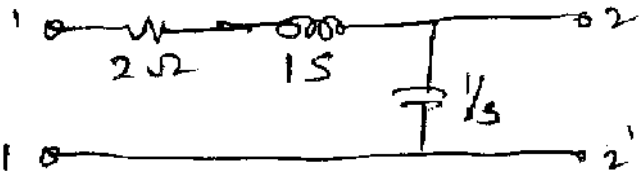
Note: Answer all questions from Part -A and any five questions from Part-B.

### PART-A (10x2 =20 Marks)

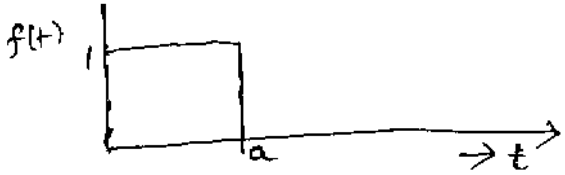
1. Define Iterative Transfer Constant & Propagation Constant of a Network
2. Find the Characteristic Impedance of the following Network.




3. Justify m=.6 for m derived terminating half sections
4. Explain briefly about Insertion Loss of a Network
5. Design a symmetrical T attenuator having an attenuation of 60dB and a nominal impedance of 600Ω
6. Test whether the following system is Stable or Not using R H Criteria
   $S^6 + 4S^5 + 6S^4 + 5S^3 + 4S^2 + 6S + 6$
7. Find the Driving Point impedance of the following network



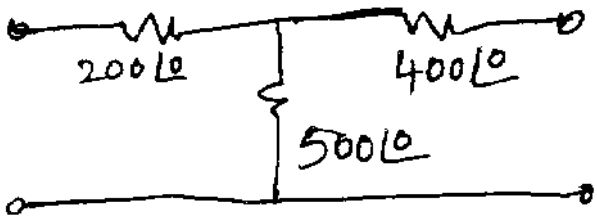

8. Find the Laplace Transform of the following wave form




9. Define Time Constant of a RL Circuit
10. Draw The Pole Zero Diagram of the following function I(S) = 5S/(S+1) )S+2) (S+3)

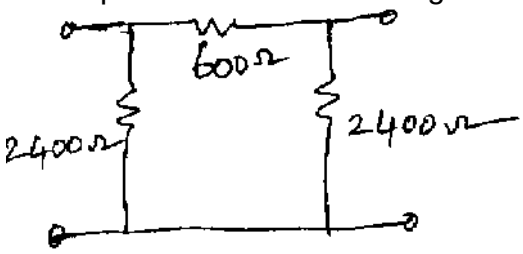
### PART-B (5x10=50 Marks)

11. a) Find the Image Impedances of the following Network 5




…2

b) Find the Characteristic Impedance of the following π Network 5




12 a) Design a m – Derived Low Pass filter (T-Section) having a Cut off Frequency of 5 KHz and Frequency of infinite attenuation 5.5KHz and a nominal Impedance of 600 Ω 5

b) Design a Band Pass filter with a cut off frequencies of 6 KHz and 10 KHz and a nominal impedance of 600 Ω 5

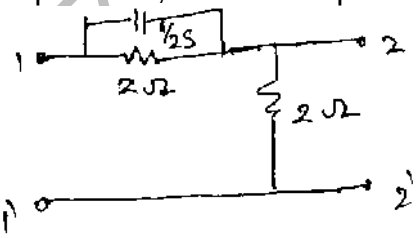
13 a) Design a Composite High Pass filter Having the cut off Frequency of 4 KHz and Frequency of Infinite attenuation of 3.5KHz and a Nominal impudence of 600 7

b) Draw the attenuation Characteristics of a Band Stop Filter 3

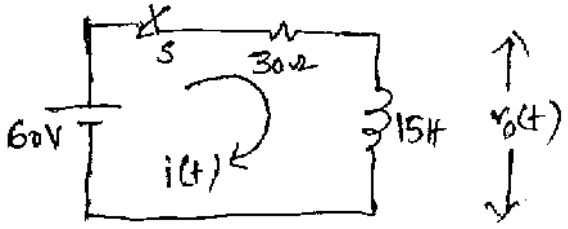
14 a) Design a Symmetrical π attenuator having an attenuation of 75dB and nominal impedance of 500Ω. Derive the formulae you use. 5

b) Design a Full shunt Equalizer for a Design Resistance of 600Ω and an attenuation of 10dB at 600 Hz 5

15 a) Find the Driving Point Impedance, Transfer impedance $Z_{21}$ of the following network 5




b) Find the output V0(t) of the following Circuit using Laplace Transform Method Switch Closes at t=0; Assume All the initial Conditions are Zero. 5




16 a) Test whether the following Polynomial Hurwitz or Not $P(S) = S^3 + 4S^2 + 5S + 2$ 5

b) find the first Cauer realization (L-C) of the Driving Point impedance function $Z(S) = 2S^5 + 12S^3 + 16S / S^4 + 4S^2 + 3$ 5

17 Answer any Two of the following (2x5)

a) List the Properties of the Positive Real Functions

b) Notch filter

c) Derive the Characteristic Impedance of a Lattice Network

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**Code No. 11415 / CBCS**

# FACULTY OF ENGINEERING

**B.E. (AE) III - Semester (CBCS) (Suppl.) Examination, May / June 2019**

**Subject : Fluid Mechanics & Machinery**

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

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

## PART – A (20 Marks)

1 One litre crude oil weighs 9.6N. Calculate its specific weight, density and specific gravity.

2 Distinguish between manometers and mechanical gauges.

3 An oil of sp.gr.0.8 under a pressure of 137.2 $kN/m^2$ what is the pressure head expressed in meters of oil.

4 Differentiate between; stream function and velocity potential function.

5 State Bernoulli's theorem. Mention the assumption made.

6 Define: Laminal boundary layer, Turbulent boundary layer.

7 How will you classify the turbines?

8 What is specific speed? State its significance in the study of hydraulic Turbines?

9 Define cavitation. What are the effects of cavitation?

10 Define coefficient of discharge and percentage of a reciprocating pump.

## PART – B (50 Marks)

11 (a) Explain the phenomenon of capillarity. Obtain an expression for capillary rise of a liquid.
(b) Determine the viscosity of a liquid having kinetic viscosity 6.0 stokes of sp.gr.2.0.

12 (a) State and derive continuity equation of liquid motion in Cartesian coordinates.
(b) A venturimeter with a 150 MM diameter at inlet and 100mm at throat is laid with its axis horizontal and is used for measuring the flow of oil of sp.gr.0.9. The oil mercury differential manometer shows a gauge difference of 200 mm. Calculate the discharge. Assume Cd as 0.98.

13 (a) Explain the term briefly "Boundary layer".
(b) Find the head lost due to friction in a pipe of diameter 200 mm and length 60 m. Through with water is flowing at a velocity of 2.5 m/s. Assume co-efficient of friction as 0.005.

14 A Kaplan turbine produces 44000 kw under a head of 24.7m with an overall efficiency 90%. Taking the value of speed ratio as 1.6, flow ratios as 0.5 and hub diameter as 0.35 times the external diameter of runner. Find the running diameter and speed of the turbine. Also find specific speed of the turbine.

**..2**

15 (a) State the advantages of a centrifugal pump over a reciprocating pump.
(b) A single acting reciprocating pump, running at 50 rpm delivers 0.00736$m^3$/s of water. The diameter of the piston is 200 mm and stroke length 300 mm. Determine;
(i) theoretical discharge and (ii) co-efficient of discharge.

16 Oil of specific gravity 0.82 is pumped through a horizontal pipe line 150 mm is diameter and 3 km long at the rate of 0.015 $m^3$/s. The pump has an efficiency of 68% and required 7.5 kw to pump the oil. Determine (i) What is the dynamic viscosity of oil? (ii) is the flow laminar.

17 (a) Explain the plot of specific speed, efficiency and performance curves evaluation of centrifugal pumps.
(b) Derive equation for deriving the boundary layer, thickness.

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Code No. 11423/S

# FACULTY OF ENGINEERING

## B.E. (CBCS) III – Semester (I.T)(Suppl.) Examination, May 2019

**Subject: Digital Electronics and Logic Design**

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

***Note: (i) Answer All Questions From Part-A & Answer Any five Questions From Part-B.***

### Part – A(20Marks)

1. Realize basic gates with NOR gates only
2. Write VHDL code to implement the function $F_1=x_1x_2+x_1x_3'$
3. Draw a 2x4 decoder with enable input, along with its truth table.
4. Write VHDL code for 2x1 multiplexer.
5. Give the functionality of D-Latch
6. Write VHDL code for D Flip flop
7. What is state minimization?
8. Give the list of elements of ASM charts
9. Write short notes on clock skew
10. Briefly explain the significance of hazards.

### Part – B (5 x 10 = 50Marks)

11. a) Minimize the following expression using K-Map into SOP and POS forms. Realize them with NAND gate only and NOR gate only
    $F(A,B,C,D) = \Sigma m(0,2,8,9,10,15) + D(1,3,6,7)$ 7
    b) Demonstrate by means of truth tables the validity of following identity
    $x + yz = (x + y)(x + z)$ 3

12. a) Explain the general structure of FPGA with neat diagram 5
    b) write the VHDL code for full adder in behavioral model 5

13. a)Explain the operation of basic SR latch and write its truth table 6
    b) Design 4 bit Shift Register 4

14. 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 |

…2

15. Explain ASM chart and data path circuit for “Shift and Add multiplier” 10

16. Write Short notes on
    a) Clock Synchronization 3
    b) Behavior of Asynchronous Sequential Circuits. 7

17. a) Explain the operation of Parallel Access Shift Register 5
    b) With a neat diagram explain the negative type master slave edge triggered D-Flip flop. 5

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**Code No: 11009/BL**

# FACULTY OF ENGINEERING

**B.E. 2/4 (Civil) I – Semester (Backlog) Examination, May/June 2019**

**Subject: Mathematics – III (Common to All Except I.T.)**

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

**Note: Answer all questions from Part A and Five questions from Part B.**

## PART – A (10x2 = 20 Marks)

1) Eliminate the arbitrary constants a, b to obtain a partial differential equation from $z = ax + by^2 - axy$ 3

2) Find the singular integral of $z = px + qy - p^2q$ 2

3) Find the Half range cosine series of the function $f(x) = ®x - x^2$ for $0 < x < ®$ 3

4) State the principle of superposition. 2

5) Seven students are to sit at one side of a straight table. Find the probability of two particular students sitting together. 3

6) A continuous random variable 'x' has the probability density function $f(x) = \begin{cases} ke^{-\frac{x}{4}} & , x \geq 0 \\ 0 & otherwise \end{cases}$, then find the value of k. 2

7) State any two applications of $x^2$ -distribution. 3

8) Define Gamma distribution and find its mean. 2

9) Fit a straight line of the form y = a + bx to the following data 3

| x: | -2 | 1 | 4 | 7 |
|---|---|---|---|---|
| y: | -1 | 4 | 9 | 14 |

10) Prove that the arithmetic mean of the coefficients of regression is greater than the coefficient of correlation. 2

## PART – B (50 Marks)

11. a) Solve p+8q = 5z + tan (y - 3x). 5

b) Find a complete integral of $2(z + xp + yq) = yp^2$ by using Charpit's method. 5

contd..2

12. Find the Fourier series of the function $f(x)=x+\frac{x^2}{4}, -\pi \le x \le \pi$. Hence deduce that $\frac{1}{1^2}-\frac{1}{2^2}+\frac{1}{3^2}-\frac{1}{4^2}+\ldots\ldots\ldots\ldots\ldots=\frac{\pi^2}{12}$. 10

13. Find the solution of the Heat equation $\frac{\partial u}{\partial t}=C^2\frac{\partial^2 u}{\partial x^2}$ subject to the boundary condition u(0,t) = u(1,t) = 0 and u(x,0) = x (here t>o). 10

14. Box A contains 2000 bulbs of which 8% are defective and box B contains 1000 bulbs of which 12% are defective. Two bulbs are picked selectively from a randomly select box. Then
    (i) Find the probability that both bulbs are defective.
    (ii) Assuming that both bulbs are defective, find the probability that they came from box B. 10

15. A number of candidates appeared to a selection trail for recruitment in the army. A random sample of heights of 10 candidates are 162 cm, 170 cm , 168 cm, 169 cm, 173 cm, 171 cm, 165cm, 166 cm, 161 cm, and 160 cm, can be conclude that the average height of the candidates is greater than 165 cm? Test at 5% level of significance. [ t (0.1) for two tailed test is 1.833] 10

16. a) Using the method of least squares, fit a parabola $y=a+bx+cx^2$ to the data

| x | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| y | 1 | 0 | 3 | 10 | 21 |

    b) Find the lines of regression for the following data 10

| x | 6 | 2 | 10 | 4 | 8 |
|---|---|---|---|---|---|
| y | 9 | 11 | 5 | 8 | 7 |

17. a) Find a complete integral of $x^2p^2+y^2q^2=z^2$ 5
    b) Find the moment generating function of Poisson distribution. 5

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**Code No. 11022/BL**

# FACULTY OF ENGINEERING

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

**Subject : Applied Mathematics**

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

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

## PART – A (20 Marks)

1 Obtain a partial differential equation by eliminating the arbitrary function from $x - y + z = f(x^2 + y^2 + z^2)$ (2)

2 Find a complete integral of $q = px + p^2$. (3)

3 Evaluate $\int_C |z|\,dz$ where C is the straight line path from z = - i to z = i. (2)

4 Evaluate $\int_C \frac{dz}{(z+1)(z-1)}$ where C is the circle |z - 1| = 1. (3)

5 Find the poles of $f(z) = \frac{1}{5z^4 + 26z^2 + 5}$ and specify their order. (2)

6 Find the residue of $f(z) = \frac{z^2 + 3z + 2}{z^2(z-1)}$ at its double pole z = 0. (3)

7 Find an approximate root of $x^3 - 29 = 0$ using Newton-Raphson method. (2)

8 Evaluate $\Delta^2(x^2 + 5x + 4)$ (Take h = 2). (3)

9 Write normal equations to fit a straight line of the form y = a + bx to the data $(x_i, y_i)$ for $1 \le i \le n$ using the method of least squares. (2)

10 Show that the coefficient of correlation and regression coefficient have the same system.. (3)

## PART – B (50 Marks)

11 (a) Solve $(z^2 - 2yz - y^2)p + (xy + zx)q = xy - zx$. (5)

(b) Solve $(p + q)(px + qy) = 1$ using Charpit's method. (5)

12 (a) Determine the analytic function f(x) = u(x, y) + iv (x, y) if $u(x, y) = y^3 - 3x^2 y$. (5)

(b) Obtain Cauchy – Riemann equation in polar form. (5)

13 (a) Find the Laurent series expansion of $f(z) = \frac{1}{z^2 - 7z + 10}$ in the regions

(i) $2 < |z| < 5$ (ii) $|Z| > 5$ (5)

(b) Find the image of the line 3x + 4y = 5 under the mapping $w = \frac{1}{z}$. (5)

14 (a) Construct the divided difference table for the following data: (5)

| x | -1 | 1 | 2 | 4 |
|---|---|---|---|---|
| f(x) | 6 | 10 | 27 | 151 |

Also determine the corresponding polynomial.

(b) If $y' = yx - x^2$, y(0) = 2 then evaluate y(0.2) by using Runge-Kutta fourth order method. (Take h = 0.2). (5)

..2

15 (a) Using the method of least squares, fit a curve of the form $y = ax^b$ for the following data: (5)

| x | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| y | 1.75 | 7 | 15.75 | 28 |

(b) Find the correlation coefficient for the following data: (5)

| X | 1 | 5 | 3 | 2 | 1 | 1 | 7 | 3 |
|---|---|---|---|---|---|---|---|---|
| Y | 6 | 1 | 0 | 0 | 1 | 2 | 1 | 5 |

16 (a) If $f(z) = \begin{cases} \dfrac{(\bar{z})^2}{z}, & if \quad z \neq 0 \\ 0, & if \ z = 0 \end{cases}$ then show that f(z) satisfy Cauchy-Riemann equations but not differentiate at z = 0. (5)

(b) Evaluate $\int_0^{2\pi} \dfrac{d\theta}{1+3\cos^2\theta}$. (5)

17 (a) Find the bilinear transformation which maps the points, 0, i and – i onto the points -1, 1 and 0 respectively. (5)

(b) Find the angle between two regression lines. (5)

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**Code No. 11039 / BL**

# FACULTY OF ENGINEERING

## B.E. 2/4 (IT) I-Semester (Backlog) Examination, May / June 2019

## Subject : Discrete Mathematics

**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 Use truth table to verify the equivalence $P \vee (P \wedge q) \Leftrightarrow P$. 2

2 Find the GCD of 414 and 662 using the Euclidean algorithm. 2

3 Define converse, inverse and contrapositive of a conditional statement. 3

4 What is the minimum number of students in discrete mathematics class to be sure that at least six will receive the same grade, if there are five possible grades A, B, C, D and F. 3

5 How many different strings can be made by reordering the letters of the made by reordering the letters of the word "Victory"? 3

6 What are the applications of Inclusion and Exclusion principle? 2

7 Show that "divides" relation on set of positive integers is not an equivalence relation. 3

8 Define bipartite graph and give example. 3

9 Define a) Chromatic number b) Isolated vertex 2

10 Give applications of Trees. 2

**PART – B** (50 Marks)

11 a) 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. 6

b) Sow that the function $f : Z^+ \to Z^+$ defined by $f(x)=x^2$ is invertible. 4

12 a) What is complexity of algorithms. 4

b) Write division algorithm? Find remainder and quotient of
i) 101 is divided by 11 ii) -11 divided by 3 6

13 Use mathematical induction to show that 10

$$\bigcap_{j=1}^{n} A_j = \bigcup_{j=1}^{n} \overline{A_j}$$

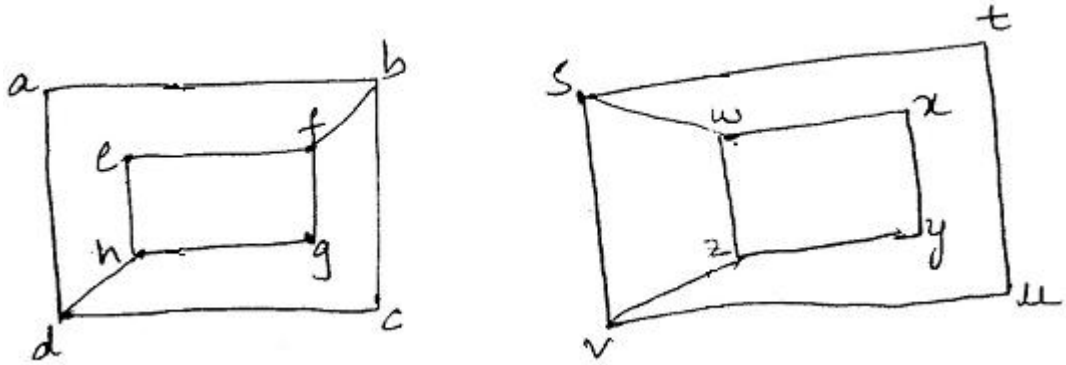
..2

14 Define Binomial theorem and find co-efficient of $a^{17}\ b^{23}$ in $(2a-6b)^{40}$. 10

15 What is the solution of recurrence relation 10

$a_n = 6a_{n-1} - 9a_{n-2}$ with initial conditions $a_0 = 1$ and $a_1 = 6$

16 Find there the graphs G and H show below are isomorphic 10




17 Explain Prim's algorithm to find a minimal spanning tree with an example. 10

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