Code No: 2519/CBCS/BL

FACULTY OF ENGINEERING

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

Building Material & Construction

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

PART – A

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

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

PART – B

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

11 (a) What are the various methods of manufacturing of bricks.
(b) Explain the various defects in timber?

12 (a) What are the various types of cement.
(b) What are the different test on coarse and fine aggregate.

13 (a) What are the various steps involved in manufacturing of a design mix concrete.
(b) How energy conservation can be done in buildings.

14 (a) Explain the methods of plastering process.
(b) What is a distemper mention its types and application.

15 (a) What is a formwork? Mention the different types of formwork.
(b) What are the steps to be considered in erection and dismantling of scaffolding.

16 (a) What are the different causes of fires and mention the methods of detection.
(b) What is DPC? Mention the effects of dampness in building.

17 (a) What is the difference between expansion joint and contraction joint.
(b) Explain the various types of cracks in buildings and their principal cause.

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Code No. 2527 / CBCS/BL

FACULTY OF ENGINEERING
B.E. (EE/Inst.) III - Semester (CBCS) (Supple.) Examination, October 2020

Subject : Digital Electronics and Logic Design

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

PART – A

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

1 Prove the following Boolean theorem

$$AB + \overline{A}C + BC = AB + \overline{A}C$$

2 What is a literal?
3 Mention the drawbacks of RTL.
4 What is an encoder?
5 Perform the addition of the following numbers in BCD 917 + 215.
6 Represent the truth table of full adder.
7 Write the truth table and execution table for SR and D flip-flops.
8 What is synchronous counter?
9 Define settling time in DAC.
10 Draw the block diagram of a digital system with analog input and output.

PART – B

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

11 a) Write down the simplified Boolean expression in sum of products from
Y(A, B, C, D) = Σm (1, 4, 6, 9, 10, 11, 14, 15)

b) Simplify the following three-variable expression using Boolean algebra
Y(A, B, C) = Σm (1, 2, 3, 4, 5, 6, 7)

12 Simplify the following Boolean function using tabular minimization
Y(A, B, C, D) = Σm (1, 2, 3, 5, 9, 12, 14, 15)+d(4, 8, 11).

13 a) Realise a full subtractor using only NOR gates.
b) Express -73.75 in 12-bit two's complement form.

14 a) Draw the schematic circuit of a positive edge-triggered JK flip-flop and explain its operation with the help of a truth table.
b) Discuss about shift registers and its applications.

15 a) Define the following parameters of DACs
i) Percentage resolution
ii) Offset voltage and
iii) Accuracy
b) With the help of neat diagram explain the working of successive approximation type ADC.

16 a) Realise the X-OR function using NAND logic.
b) Explain about the wired AND operation.

17 a) Discuss about the working of ripple counters.
b) What is excess-3 arithmetic. Give two examples.

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Code No: 2533/CBCS

FACULTY OF ENGINEERING

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

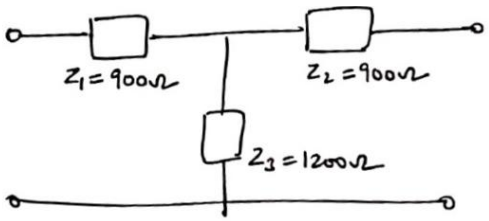
Subject: Network Analysis & Synthesis

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

PART – A

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

1. Define any two parameters of an Asymmetrical Network
2. Find the characteristic impedance of the following circuit given below



3. Explain how attenuation (α) varies with frequency for a Low Pass Filter deign.
4. Write the design equations for a Constant-K Band-Pass Filter.
5. Define an attenuator and write the types of attenuators
6. Define inverse impedance and explain with an example.
7. What are the necessary conditions for a Driving Point Functions.
8. Derive the relation between Voltage and Current for R, L and C in S-domain
9. State whether the following function is a driving point Immitance of LC network or not

$$F(S) = \frac{2(S^2+1)(S^2+9)}{S(S^2+2)}$$

10. Explain the concept of removing a conjugate imaginary poles.

PART – B

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

11. (a) Show that the propagation constant of a symmetrical T and π networks are same.
    (b) For a symmetrical π network, $Z_1 = j\omega L, Z_2 = \frac{1}{j\omega C}$ Calculate its Characteristic impedance at 500 Hz and 1 KHz, if L = 0.1H and C = 2μF.

12. (a) Design m-derived π - type HPF to work into load of 600Ω and cut-off frequency of $\frac{1000}{\pi}$ Hz and peak attenuation at 300Hz.
    (b) Design a constant – k LPF (T-type) having a cut off Frequency of 4 KHz and nominal characteristic impedance of 500 Ω

13. Design a Composite Low Pass Filter to meet the following specifications. The filter is to Be terminated in 500Ω resistance and it is to have a cut-off frequency of 1KHz with very high attenuation at 1065 Hz.

14. (a) An Attenuator is composed of Symmetrical π-section having a series arm of 275Ω and a shunt arm of 450Ω. Find the characteristic impedance and attenuation.

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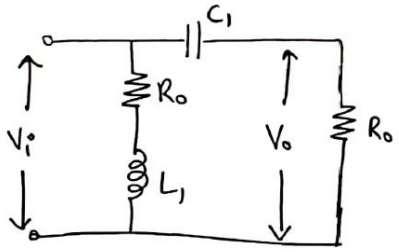
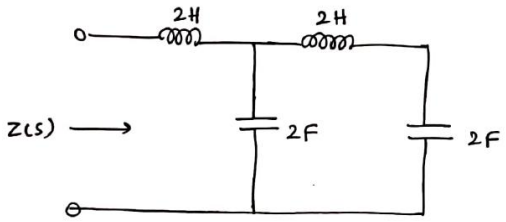
(b) Design a full shunt equalizer as shown in figure below. Such that design resistance is 600Ω and attenuation is 26 dB at 800 Hz frequency. Calculate the attenuation at frequency of 1200 Hz.



15. (a) Determine the driving point impedance of a network.



(b) Derive an expression for the step response of a series RL circuit.

16. (a) Realize the Foster II form and cauer II form of the following impedance function.

$$F(S) = \frac{8(S^2+16)(S^2+9)}{S(S^2+4)}$$

(b) Write the properties of an LC driving point immitance functions and explain the realization of foster I form.

17. Answer any two of the following :

(a) Define any three properties of Transfer functions.

(b) Test whether $F(S) = \frac{2S^3+2S^2+3S+2}{S^2+1}$ is positive real function or not.

(c) Write the properties of RC and RL driving point immitance functions.

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Code: 2542/CBCS/BL

FACULTY OF ENGINEERING
BE III Semester (CBCS)(A.E) (Backlog) Examination, October 2020

Subject: Fluid Mechanics and Machinery

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

PART – A

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

1 Find the Kinematic Viscosity of an Oil having density 980 $\frac{kg}{m^3}$, when at a certain point in the oil, the shear stress is 0.25$\frac{N}{m^2}$ and viscosity of the gradient is 0.3/s.
2 What is cavitation? What causes it?
3 Explain Pascal's law.
4 Differentiate between rotational ir-rotational flows.
5 Define stream line.
6 Why friction factor is independent of Reynolds number at very large Reynolds numbers?
7 What is priming? And why is it necessary?
8 What is cavitation? And how to avoid cavitation in reaction Turbine?
9 Differentiate inward flow and outward flow.
10 Explain Main performance characteristic curves.

PART – B

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

11 Determine the gage and absolute pressure at appoint which is 2m below the free surface of water. Take atmospheric pressure as 10.1043$\frac{N}{cm^2}$
   (a) Calculate the specific weight, density and specific Gravity of two liters of a liquid which weight 15N
   (b) Define dynamic viscosity

12 Stream function for a two-dimensional flow is given by Ψ=2xy, calculate the velocity at the point P (2, 3). Find the velocity potential function Φ.

13 Derive Euler equation of motion from the stream line. And explain how this is integrated to get Bernoulli's Equation.

14 Prove that the loss of pressure head for viscous flow through the circular pipe is given $h_f = \frac{32\mu v_{avg} L}{\rho g d^2}$

15 Define
   (a) Laminar boundary layer
   (b) Turbulent boundary layer
   (c) Sub-laminar boundary layer

16 A centrifugal pump discharges 0.12$\frac{m^3}{s}$ at speed of 1450 rpm. against a head of 25m. The impeller diameter is 250mm, width at outlet is 50mm and manometric efficiency is 77%. Determine the vane angle at outer periphery of the impeller.

17 A Pelton wheel has a mean bucket speed of 35m/s with jet of water flowing at rate of 1 $\frac{m^3}{s}$, under a head of 277m.the bucket deflection angle 170°. Calculate power deliver to the runner and hydraulic efficiency of the turbine.(Assume co-efficient of velocity 0.98)

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Code: 2550/CBCS/BL

FACULTY OF ENGINEERING

BE III Semester (CBCS)(A.E) (Backlog) Examination, October 2020

Subject: Digital Electronics and Logic Design

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

PART – A

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

1 State Demorgan's Laws
2 Neatly draw the general structure of PLA
3 What is the advantage of Custom Chip?
4 Implement XNOR gate using NOR gates only
5 Write the characteristic equation of the flip flops a) SR flip flop b) D Flip Flop and explain code converters
6 Explain in detail the elements of ASM charts.
7 Explain static hazard with example.
8 Write the VHDL code for 4 x 1 multiplexer
9 What are the applications of shift registers?
10. Explain difference between sequential and combinational circuits

PART – B

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

11 Find the minimum cost SOP forms for the function
$f(x_1, x_2, x_3) = \Sigma m(1, 4, 7) + D(2, 5)$, draw the logic circuit using NAND gates alone. Write VHDL code for the above function.

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

13 (a) With a neat diagram explain the negative type Master Slave Edge triggered D Flip Flop
(b) Draw a 3 – bit Down Counter

14 (a) Explain in detail about JK – Flip – Flop and T – Flip – Flop
(b) Explain the operation of parallel access shift register with a neat diagram.

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

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

(b) Design a 3 – bit up counter

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

17 Explain the following:
(a) Explain Shannon's expansion theorem
(b) CAD tools
(c) Ring Counter
(d) Johnson Counter

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Code No. 2010/BL

FACULTY OF ENGINEERING

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

Subject: Mathematics-III

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

PART – A

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

1 Derive a partial differential equation (by eliminating the constants) from the equation $2z = \frac{x^2}{a^2} + \frac{y^2}{b^2}$.

2 Solve $2xz - px^2 - 2qxy + pq = 0$, where $p = \frac{\partial z}{\partial x}, \quad q = \frac{\partial z}{\partial x}$.

3 State Euler's formula for the function $f(x)$, $\alpha < x < \alpha + 2\pi$.

4 State Euler's formula for the function $f(x)$ defined in $(-c, c)$ in Fourier series.

5 If x be a random variable with probability generating function $P_x(t)$, find the probability generating function of $x + 2$.

6 From six engineers and five architects a committee is to be formed having three engineers and two architects. How many different committees can be formed if there is no restriction?

7 Show that mean and standard deviation of the Poisson distribution are same.

8 Differentiate Null and Alternate hypothesis.

9 Define the coefficient of correlation.

10 Write the normal equations corresponding to fit the straight line by the method of least square.

PART – B

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

11 Solve $\frac{\partial^3 z}{\partial x^3} - 2\frac{\partial^3 z}{\partial x^2 \partial y} = 2e^{2x} + 3e^2 y$.

12 Find the Fourier series for $\begin{cases} 0, & -2 < t < -1 \\ 1+t, & -1 < t < 0 \\ 1-t, & 0 < t < 1 \\ 0, & 1 < t < 2 \end{cases}$.

13 Solve the differential equation $\frac{\partial u}{\partial t} = \alpha^2 \frac{\partial^2 u}{\partial x^2}$ for the condition of heat along a rod without radiation, subject to (i) *u* is not infinite for $t \to \infty$, (ii) $\frac{\partial u}{\partial x} = 0$ for $x = 0$ and $x = l$, (iii) $u = lx - x^2$ for $t = 0$ between $x = 0$ and $x = l$.

..2

14 Three machines μ_1, μ_2 and μ_3 produce identical items of their respective output 5%, 4% and 3% of items are faulty. On a certain day, μ_1 has produced 25% of the total output, μ_2 has produced 30% and μ_3 the remainder. An item selected at random is found to be faulty. What are the chances that it was produced by the machine with highest output?

15 The mean of a certain normal population is equal to the standard error of the mean of the samples of 100 from that distribution. Find the probability that mean of the sample of 25 from the distribution will be negative?

16 The two regression equations of the variables x and *y* are x=19.13-0.87y and *y=11.64=0.5x.* Find
(i) mean of *x*'s,
(ii) mean of *y*'s and
(iii) coefficient of correlation between *x* and *y.*

17 The pressure and volume of a gas are related by the equation $pv^a = b$, *a and b* are constants. Fit this equation to the following set of observations.

$p\left(\frac{kg}{cm^2}\right)$:	0.5	1.0	1.5	2.0	2.5	3.0
v (liters):	1.62	1.00	0.75	0.62	0.52	0.46

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Code No. 2023/BL

FACULTY OF ENGINEERING

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

Subject: Applied Mathematics

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

PART – A

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

1 Obtain the partial differential equation by eliminating the arbitrary constants C_1, C_2 and C_3 from $Z = C_1x^2 + 2C_2 xy + C_3 y^2$.

2 Solve p(1+ q) = qz

3 Show that $f(z) = 2\bar{z} + z$ is not analytic at any point.

4 Show that $\int_c (z-a)^n dz$, n is any integer

5 Define removable singularly, essential singularity and pole. of a function f(z)

6 Evaluate $\int_c$ Tan z dz where C is the circle $|z| = 2$

7 Explain Bisection Method to find an approximate root of f(x)=0.

8 Derive Euler's method to solve the IVP, $\frac{dy}{dx} = f(x, y), y(x_o) = y_a$

9 Show that the correlation coefficient is the geometric mean of the regression coefficients

10 Explain rank correlation

PART – B

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

11. a) Solve $2z + p^2 + qy + 2y^2 = 0$ using charpits method
    b) Solve $x^2 (y-z) p + y^2 (z-x) q = z^2 (x-y)$

12. a) Show that the function $f(z) = \sqrt{|xy|}$ is not analytic at the origin even though Cauchy – Reimanns equations are satisfied therof.
    b) Evaluate $\oint_c \frac{e^{2z}}{(z+i)^4} dz$ where C is the circle $|z| = 3$

13. a) Expand $f(z) = \frac{1}{(z-1)(z-2)}$ is the region $(i)|<|z|<2$ $(ii)\ 0 < |z-1| <|$
    b) Evaluate $\int_{-\infty}^{\infty} \frac{x^2}{(x^2+1)(x^2+4)}$ dx using residue theorem

14. a) Evaluate $\sqrt[3]{24}$ Value correct to 4 decimal places by newton – Raphson method.
    b) Find the tubic polynomial which takes the following values.

X :	0	1	2	3
f(x) :	1	2	1	10

…2

15 a) By the method of least square, find the straight line that best fits, the following data

X	1	2	3	4	5
Y	14	27	40	55	68

b) Find the correlation coefficient and lives of regression for the data

X	2	4	6	8	10
Y	5	7	9	8	11

16 a) Evaluate f(9) using Lagrange's Interpolation for the data.

X	5	7	11	13	17
f(x)	150	392	1492	2366	5202

b) Apply Runge Kutta 4th order method to find an approximate value of y when x=0.2, given that $\frac{dy}{dx} = x + y, y(0) = 1$.

17. a) Calculate the coefficient of rank correlation for the data.

X	3	8	9	2	7	10	4	6	1	5
Y	5	9	10	1	8	7	3	4	2	6

b) Find the analytic function, whose real past is

$$u = \frac{\sin 2x}{\cosh 2y - \cos 2x}$$

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Code No: 2039/BL

FACULTY OF ENGINEERING

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

Subject: Discrete Mathematics

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

PART – A

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

1. What is the value of quotient 'q' and the remainder 'r' when a = 58237 and d = 58168 using division algorithm
2. Write the recursive algorithm for Fibonacci numbers.
3. How many different strings can be made by reordering the letters of the word 'VICTORY'?
4 State the generalized pigeonhole principle.
5. Find the number of positive integers not exceeding 100 that are not divisible by 5 or by 7.
6. Find the solutions to the recurrence relation with the initial conditions.

   $a_0 = 2$, $a_1 = 5$, $a_n = 6a_{n-1} - 11a_{n-2}$
7. Write short notes on representation of relations.
8. Define Euler Circuit and give an example.
9. Define a minimum spanning tree.
10. Draw the K-maps for $xy + x\,y$.

PART – B

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

11. a) Show that ~(pv(~p^q)) and ~p^~q are logically equivalent by developing a series of logical equivalences.
    b) Show that the function f: $Z^+ \to Z^+$ defined by $f(x)=x^2$ is invertible.

12. a)What is Complexity of Algorithms.
    b) Write division algorithm? Find remainder and quotient of
    i) 101 is divided by 11.
    ii) -11 divided by 3?

13. Use mathematical induction to show that $1+2+2^2+\ldots+2^n=2^{n+1}-1$ for all non negative integers n.

14. Define Binomial Theorem and find Co-efficient of $a^{17}b^{23}$ in $(2a-6b)^{40}$

15. What is the solution of the recurrence relation $a_n = 6a_{n-1} - 9a_{n-2}$ with initial conditions $a_0 = 1$ and $a_1 = 6$?

16. a) Show that the relation R on a set 'A' is reflexive if and only if the inverse relation R^{-1} is reflexive.
    b) What is Graph Coloring and give it applications?

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

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