Enrollment No……

Bachelor of Engineering

Third Semester Main Examination, Dec-2020

Electrical Measurements and Instrumentation [EX-221]

Branch: EX

Time: 3:00 Hrs **Max Marks 70**

Note: 1. Attempt any five questions out of eight.
2. All questions carry equal marks.

Q.1 (a) Define the terms-
(i) Accuracy (ii) Precision
(iii) Static sensitivity (iv) Reliability
(b) What do you mean by calibration curve? Explain loading effects due to shunt connected and series connected instruments.

Q.2 (a) Explain the construction and working of D'arsonal Galvanometer.
(b) Explain why PMMC instruments are the most widely used instruments. Discuss their advantages and disadvantages.

Q.3 (a) Explain with the help of block diagram the working of Digital voltmeter.
(b) Write down the difference between current transformer and potential transformer. Also explain their working.

Q.4 (a) Describe the constructional details and working of an electro-dynamometer type of wattmeter. Discuss the main sources of errors in electrodynamometer type instruments.
(b) Explain the measurement of power using
(i) Three wattmeter method (ii) CTs and PTs

Q.5 (a) Explain the construction and operation of single phase and three phase electronic energy meter.
(b) What is Phantom loading? Explain with example. Also describe the testing by phantom loading for energy meters

Q.6 (a) Describe the circuit diagram of a series type ohm meter. Explain how it is designed. Why are series type ohm meter preferred over shunt type ohm meters?
(b) What is a B-H curve in terms of magnetic material? Write down its characteristics?

Q.7 Write short notes on (Any Two):
(i) Lloyd fisher square method (ii) Economics of measurement system
(iii) Kelvin's double bridge (iv) Maximum demand meter

Enrollment No……

Bachelor of Engineering
Third Semester Main Examination, Dec-2020
Network Analysis (EX222T)
Branch-EX

Time: 3:00 Hrs **Max Marks 70**

Note: 1. Attempt any five questions.
2. Each question carries equal marks.
3. Assume suitable data if necessary & state them clearly

Q.1 (a) Find the voltage across 5 Ω in the magnetically coupled circuit as shown in the figure no. (1). 7

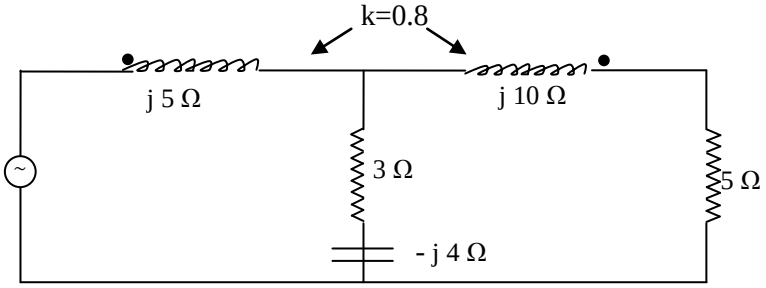

Figure No.-1

(b) Consider a series R-L Circuit, as shown in figure no.2, The switch S is closed at time t=0. Find the current i(t) through and voltage across the resistor and inductor. 7

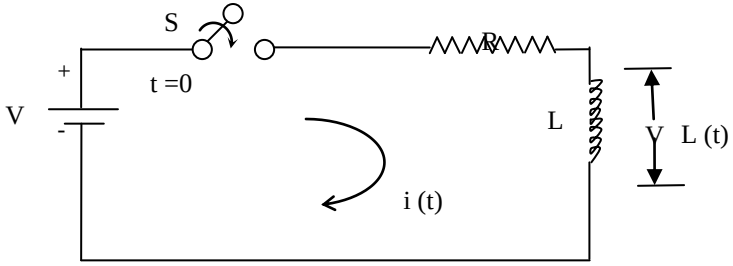

Figure No.-2

Q.2 (a) Explain with the help of examples the following terms used in network analysis: - 7

(i) Network graph
(ii) Tree of graph
(iii) Cut-set and Tie-set matrix.

(b) Derive the expression of resonant frequency for a series R-L-C Circuit. Also define Q-Factor. 7

Q.3 (a) State and explain 'Superposition theorem' and also write its application & limitations. 7

(b) Use the Thevenin's theorem to find the power in a l Ω resistor connected to the terminals AB of the network shown in figure no.3. 7

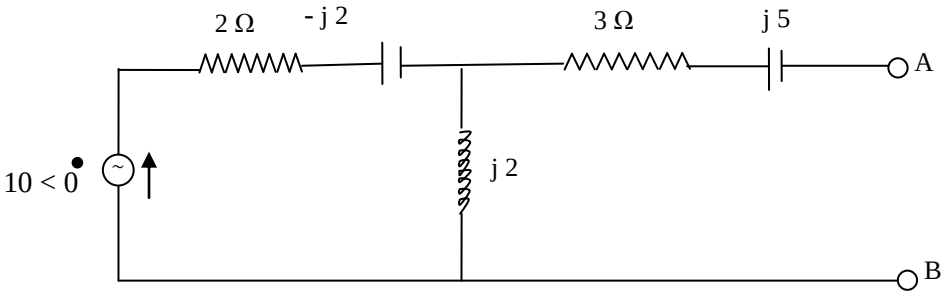

Figure No.-3

Q.4 (a) State and explain 'Maximum power transfer' theorem for A.C. network with the help of suitable example. 7

(b) State and explain the following:- 7

(i) Reciprocity theorem

(ii) Millman's theorem

Q.5 (a) Obtain the S-domain equivalent circuit for an inductor with initial current. 7

(b) Find $V_c(0^-)$ and $V_c(0^+)$ for the circuit shown in figure no .4. Obtain the equation for $V_c(t)$ for t>0. Solve for $V_c(t)$ using Laplace transforms. 7

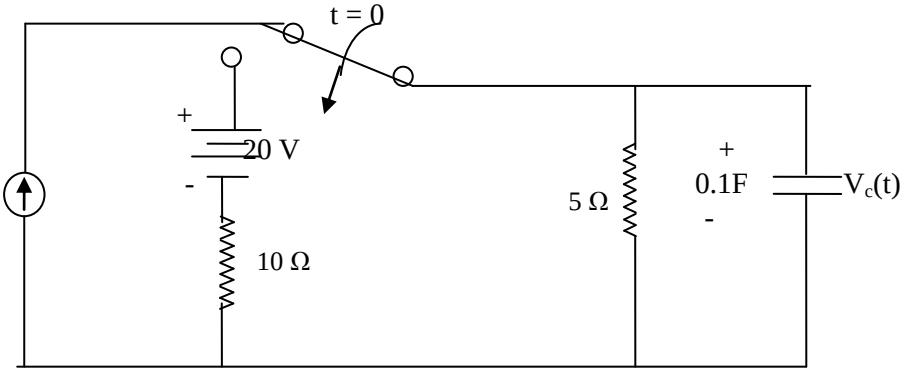

Figure No.-4

Q.6 (a) What is half wave symmetry? Explain with the help of an example. 7

(b) Find the trigonometric Fourier series for the square wave shown in figure no.5 7

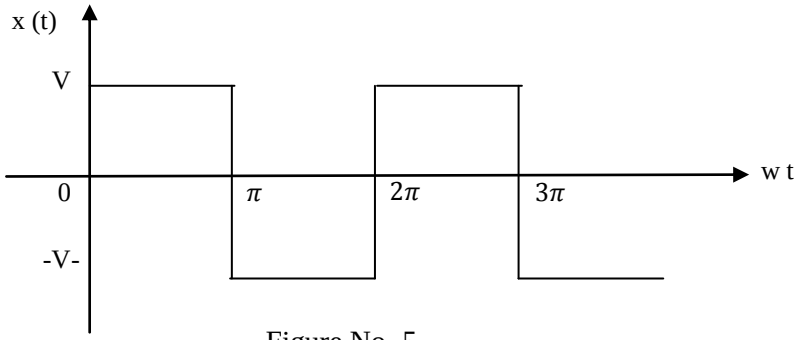

Figure No.-5

Q.7 (a) Define the terms 'Driving point impedance' and 'Voltage ratio transfer function' with reference to two-port networks. 7

(b) Find the open circuit transfer impedance $\frac{V_{2(S)}}{I_1(S)}$ and open circuit voltage ratio $\frac{V_{2(S)}}{V_1(S)}$ for the network shown in figure no. 6. 7

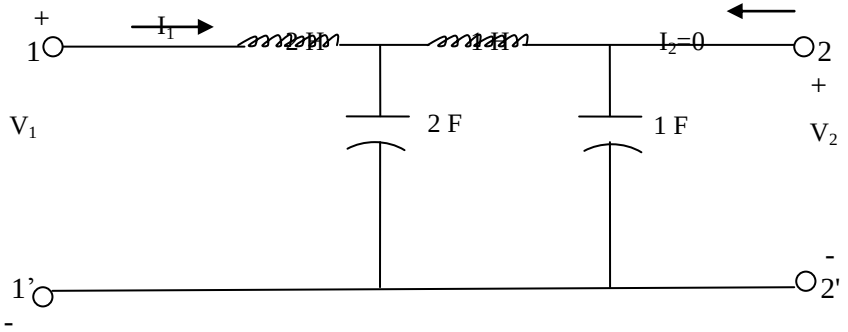

Figure No.-6

Q.8 (a) What are 'Open circuit impedance' parameters of two-port networks? How can the 'transmission parameters' be obtained for the 'open circuit impedance' parameters? 7

(b) Find the transmission parameter (A, B, C, D) for the network shown in figure no.7. 7

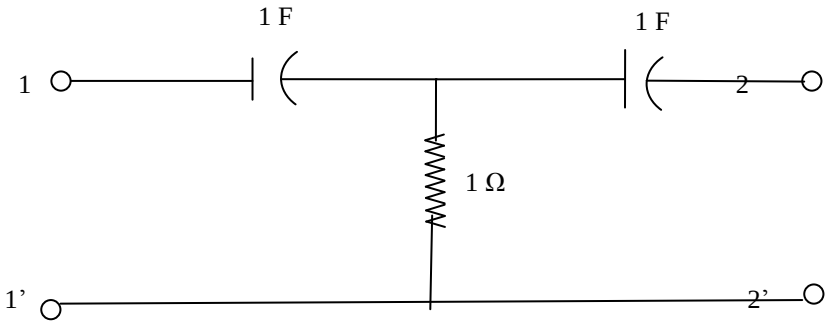

Figure No.-7

Enrollment No……

Bachelor of Engineering
Third Semester Main Examination, Dec-2020
Analog Electronics (EX223)
Branch-EX

Time: 3:00 Hrs **Max Marks 70**

Note: Attempt any five questions.

Q.1 **(a) What is P-N Junction? Explain its temperature dependence and break down characteristics.**
(b) What is Diode? Explain all types of diodes and its applications.

Q.2 **(a) Explain oscillator? Explain sinusoidal oscillators with suitable diagram.**
(b) Explain in detail depletion node of operation in MOSFET?

Q.3 **(a) Define multivibrators? Write and explain various types of multivibrators.**
(b) What is voltage to current and current to voltage converters.

Q.4 **(a) Explain transistor as an amplifier with a suitable diagram.**
(b) Define MOSFET? Write its type with symbols and diagram.

Q.5 **(a) Explain in detail 555 timers? Write its application.**
(b) Explain Wien Bridge and Crystal Oscillators.

Q.6 **(a) Explain MOSFET? Write a difference between MOSFET and BJT.**
(b) Explain Thermal Runway?

Q.7 **(a) Define amplifier? Explain in detail class A amplifier.**
(b) What is rectifier? Write basic difference between half wave and full wave rectifier with waveforms.

Q.8 (a) Explain clipper and clamper circuit?

(b) Write short note on:

(i) OP-amp

(ii) Push Pull Amplifier

(iii) Thermal Stability

(iv) Active Filter

Enrollment No……

Bachelor of Engineering
Third Semester Main Examination, Dec-2020
Signals and Systems (EX224T)

Time: 3:00 Hrs **Max Marks 70**

Note : 1. Attempt any five questions out of eight.
2. Answer should be precise & to be point only.
3. Assume suitable data if necessary & state them clearly.

Q.1 **(a) State and prove convolution theorem.** **(7)**
(b) Fined the fourier transform of the signal :- **(7)**
$x(t) = e^{-bltl} \cos w_0 t$

Q.2 **(a) What do you mean by singularity functions ? Explain the importance of these function.** **(7)**
(b) Determine whether the following signals are periodic or not:- **(7)**
i) $x(t) = \sin 15\pi t$ **ii)** $x(t) = \sin \sqrt{2}\,\pi t$

Q.3 **(a) What are the properties of continuous time LTI systems ?** **(7)**
(b) Check whether the following systems are LTI systems:- **(7)**
i) $\frac{d^3y(t)}{dt^3} + 2\frac{d^3y(t)}{dt^2} + 4\frac{dy(t)}{dt} + 3y^2(t) = x(y+1)$
ii) $y(n) = a^n u(n)$

Q.4 **(a) What do you understand by Region of convergence (ROC). Give an example.** **(7)**
(b) What is the difference between fourier transform and Laplace transform. Define wavelet transform also. **(7)**

Q.5 **(a) State Dirichlet's conditions. Fined out the z-transform for the following discrete time sequences.**
$x(n) = kn^2, n \geq o$ **(7)**

(b) Obtain in verse z-transform using partial fraction expansion method, where. **(7)**
$x(z) = \frac{1}{(z-1)(z-3)}$

Q.6 **(a) State and prove any two properties of DTFT and state the significance of impulse response. (7)**

(b) What do you mean by sampling ? How aliasing effect is minimized? (7)

Q.7 **The input x(t) and output y(t) for a system satisfy the differential equation (7)**

$$\frac{d^2y(t)}{dt^2} + 3\frac{dy(t)}{dt} + 2y(t) = x(t)$$

(a) Compute the transfer function and impulse response. (7)

(b) Draw the block diagram representation and other representation.(7)

Q.8 **Write short notes on (any two). (14)**

(a) Digital filters.

(b) Energy and power signals.

(c) CT systems and DT systems.

Enrollment No……

Bachelor of Engineering
Third Semester Main Examination, Dec-2020
Communication Skills (HU220T)
Branch-CE/EE/EC/CS/IT/ME

Time: 3:00 Hrs **Max Marks 70**

Note : (i) Attempt any five questions. All questions carry equal marks.
(ii) Answer should be precise & to be point only.
(iii) Assume suitable data if necessary & state them clearly

Q.1 **(a) What is communication? Explain importance of communication in detail?**
(b) What are different barriers to communication and how will you eliminate them?

Q.2 **(a) How are non-verbal communication in an online environment?**
(b) What do you mean by communication styles? Explain.

Q.3 **(a) Define cycle of communication. Discuss the role of feedback in the cycle of communication.**
(b) What do you mean by encoding & decoding of the message? What is the role of source and receiver in communication?

Q.4 **(a) What are some examples of non-verbal signals that we convey in communication with other peoples?**
(b) What is the importance of studying non-verbal communication?

Q.5 **(a) Discuss the level of communication.**
(b) What are the different challenges in communication?

Q.6 **(a) What is paralinguistic features of communication.**
(b) What is volume in paralinguistics?

Q.7 **(a) What is proxemics in non-verbal communication?**
(b) Discuss the features importance to make an oral presentation effective.

Q.8 **Write short notes on-** **(Marks=14)**
(a) Feedback
(b) Semantic barriers
(c) Voice modulation
(d) Gesture.

Enrollment No……

Bachelor of Engineering
Third Semester Main Examination, Dec-2020
Mathematics-III [MA-220]
Branch-EE/EC/CS/IT

Time: 3:00 Hrs **Max Marks 70**

Note : Attempt any five questions.
All question carry equal marks.

Q.1 (a) State and prove Cauchy's theorem.
(b) Show that the function $e^x(cosy + isiny)$ is analytic and find its derivative.

Q.2 (a) Using Cauchy's integral formula prove that : $\int_C^3 \frac{e^{2z}}{(z+1)^4} dz = \frac{8\pi e^{-2}}{3} i$, where C is the circle $|z| = 3$.
(b) Find the imaginary part of the analytic function whose real part is $x^3 - 3xy^2 + 3x^2 - 3y^2$.

Q.3 (a) Find the real root of the equations $x^3 - 9x + 1 = 0$ by the method of false position.
(b) Apply Newton Raphson method to solve $3x = cosx + 1$.

Q.4 (a) Using Newton's forward Interpolation formula, find the value of $f(1.6)$,if

x:	1	1.4	1.8	2.2
y:	3.49	4.82	5.96	6.5

(b) Solve the following system by Gauss elimination method

$$6x_1 + 3x_2 + 2x_3 = 6$$
$$6x_1 + 4x_2 + 3x_3 = 0$$
$$20x_1 + 15x_2 + 12x_3 = 0$$

Q.5 (a) Apply Lagrange's formula to find the value of x when f(x) = 0 given that

x:	30	34	38	42
$f(x)$:	−30	−13	3	18

(b) Solve initial value problem $\frac{dy}{dx} = 1 + xy^2$, $y(0)$=1 for $x = 0.4$, 0.5 by using Milne's method when it is given that

x:	0.1	0.2	0.3
y:	1.105	1.223	1.355

Q.6 (a) Solve the equation $\frac{dy}{dx} = x + y$ with initial condition $y(0) = 1$ by Runge kutta rule from $x = 0$ to $x = 0.4$ with $h = 0.1$

(b) Evaluate $\int_{0.5}^{0.7} x^{1/2} e^{-x} dx$ approximately by using a suitable formula.

Q.7 (a) Solve the following by Euler's modified method, the equation $\frac{dy}{dx} + \log(x + y), y(0) = 2$ at $x = 1.2$ and 1.4 with $h = 0.2$
(b) Use picard's method to approximate y when $x = 0.2$ given that $y = 1$ when $x = 0$ and $\frac{dy}{dx} = x - y$

Q.8 (a) Find the z Transform of Sinak, k7,0

(b) Solve the following by Gauss Seidel iteration Method

$$10x + y + z = 12$$

$$2x + 10y + z = 13$$

$$2x + 2y + 10z = 14$$