

II B. Tech I Semester Supplementary Examinations, July - 2022

MATHEMATICS - III

(Com to all branches)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions each Question from each unitAll Questions carry **Equal** Marks

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- 1 a) If  $f(x, y, z) = 2x^2 + 4xy + 3z$  then find  $\text{grad } f$ . [4M]  
 b) Find the divergence of the vector function  $\vec{F} = 3x^2 \vec{i} + 5xy^2 \vec{j} + xyz^3 \vec{k}$ . [5M]  
 c) Find Curl of the vector function  $\vec{F} = e^{xyz} (i + j + k)$ . [5M]

Or

- 2 Verify Green's theorem in plane for  $\oint_C [(x^2 - 2xy)dx + (x^2y + 3)dy]$ , where C [14M]

is boundary of the region defined by  $y^2 = 8x$  and  $x = 2$ .

- 3 a) Find the Laplace transform of  $2^t + \frac{\cos 2t - \cos 3t}{t} + t \sin t$ . [7M]  
 b) Find  $L^{-1} \left\{ \frac{16}{(s-2)(s+2)^2} \right\}$  using convolution theorem. [7M]

Or

- 4 a) Find the Laplace transform of  $t e^{4t} \sin 2t$ . [4M]  
 b) Use transform method to solve the differential equation [10M]  
 $\frac{d^2x}{dt^2} - 2\frac{dx}{dt} + x = e^t$  with  $x = 2, \frac{dx}{dt} = -1$  at  $t = 0$ .  
 5 a) Find the Fourier series for the function  $f(x) = e^{ax}$  in  $(-\pi, \pi)$ . [7M]  
 b) Express  $f(x) = x$  as a half-range cosine series in  $0 < x < 2$ . [7M]

Or

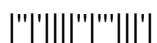
- 6 a) Find the Fourier cosine integral and Fourier sine integral of [7M]  
 $f(x) = e^{-ax} - e^{-bx}$ ,  $a > 0, b > 0$ .  
 b) Find the Fourier cosine transform of  $f(x) = e^{-ax} \cos ax$ . [7M]  
 7 a) Form the partial differential equation by elimination the arbitrary function f [5M]  
 from the relation  $z = x^2 + 2f\left(\frac{1}{y} + \log x\right)$ .  
 b) Solve the partial differential equation [5M]  
 $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$ .  
 c) Find the complete integral of  $pe^y = qe^x$ . [4M]

Or

- 8 a) Form PDE from  $z = ax + by + a^2 + b^2$ . [4M]  
 b) Solve the partial differential equation [5M]  
 $\tan x \, p + \tan y \, q = \tan z$ .  
 c) Find the complete integral of  $p^3 - q^3 = 0$ . [5M]
- 9 a) Solve  $\frac{\partial^2 z}{\partial x^2} - \frac{\partial^2 z}{\partial x \partial y} = \cos x \cos 2y$ . [7M]  
 b) Solve  $\frac{\partial^2 z}{\partial x^2} - 4 \frac{\partial^2 z}{\partial x \partial y} + 4 \frac{\partial^2 z}{\partial y^2} = e^{2x+y}$ . [7M]

**Or**

- 10 Solve the wave equation  $\frac{\partial^2 y}{\partial t^2} = c^2 \frac{\partial^2 y}{\partial x^2}$  under the conditions [14M]  
 $y(0, t) = 0$ ,  $y(L, t) = 0$  for all  $t$ ;  
 $y(x, 0) = f(x)$  and  $\left(\frac{\partial y}{\partial t}\right)_{t=0} = g(x)$ ,  $0 < x < L$ .



**II B. Tech I Semester Supplementary Examinations, July - 2022**  
**NETWORK ANALYSIS**  
 (Com to ECE, EIE and ECC)

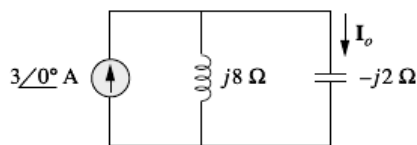
Time: 3 hours

Max. Marks: 70

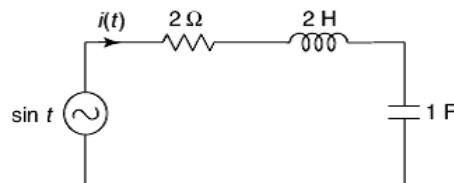
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **FOUR** Questions from **Part-B**

**PART -A**

1. a) The current in an 80-mH inductor increases from 0 to 60 mA. How much (2M)  
 energy is stored in the inductor?  
 b) Find the value of current in the circuit (3M)

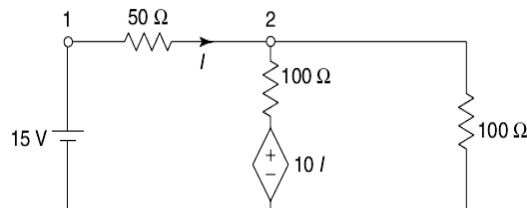


- c) Define Q-Factor. (2M)  
 d) State Maximum Transfer theorem. (2M)  
 e) What is the condition for the two-port network to be reciprocal? (2M)  
 f) The differential equation for the current  $i(t)$  in the circuit is \_\_\_\_ (3M)

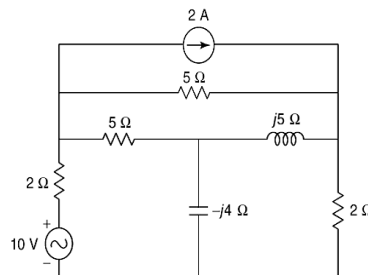


**PART -B**

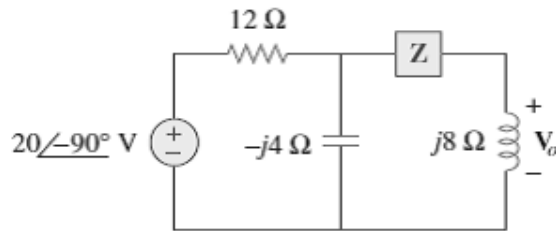
2. a) Find the voltage at Node 2 of the network shown in Fig. (7M)



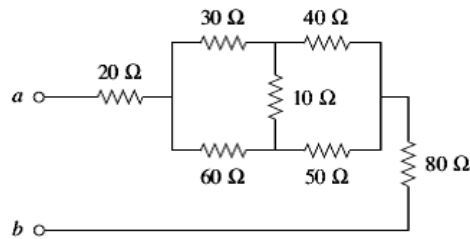
- b) For the network shown in Fig, write down the tie-set matrix and obtain the network equilibrium equation in matrix form using KVL. (7M)



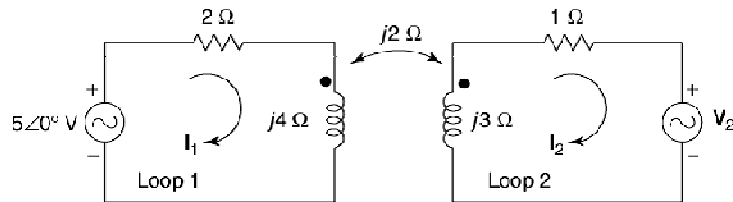
3. a) Find  $\mathbf{Z}$  in the network of Fig., given that  $\mathbf{V}_o = 4\angle 0^\circ \text{ V}$ . (7M)



- b) Obtain the equivalent resistance  $R_{ab}$  in the circuit (7M)

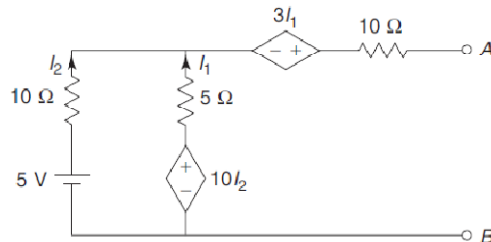


4. a) Find the voltage  $V_2$  in the circuit shown in Fig. such that the current in the left-hand loop (Loop 1) is zero. (7M)

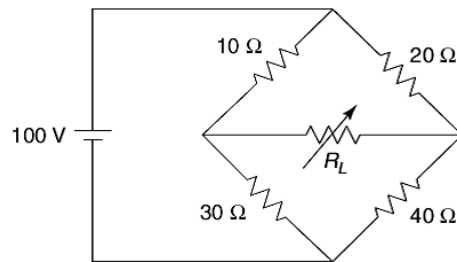


- b) Design a series RLC resonant circuit with  $\omega_0 = 40 \text{ rad/s}$  and  $B = 10 \text{ rad/s}$ . (7M)

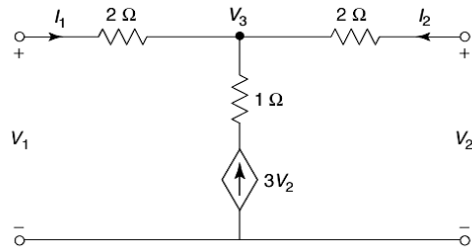
5. a) Find the Norton's equivalent across the terminals A and B (7M)



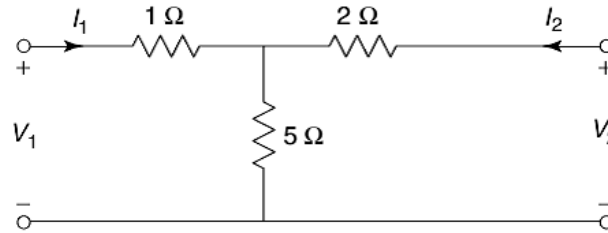
- b) Find the value of  $R_L$  for the maximum power to be transferred to it and find maximum power that is transferred. (7M)



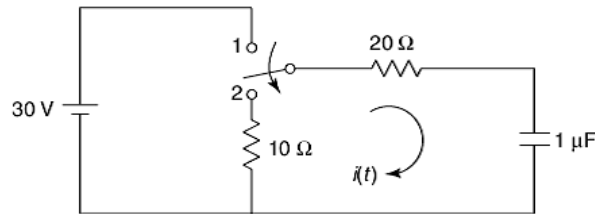
6. a) Find the Y-parameters for the network shown in fig. (7M)



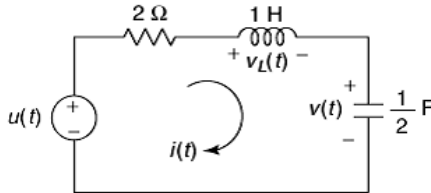
- b) Find the transmission parameters for the network shown in figure (7M)



7. a) In the network shown in Fig., the switch is changed from the position 1 to the position 2 at  $t = 0$ , steady condition having reached before switching. Find  $i$ ,  $di/dt$  and  $d^2i/dt^2$  at  $t = 0^+$ . (7M)



- b) Determine whether RLC circuit of Fig. is underdamped, overdamped, or critically damped. Find also  $V_L(0^+)$ ,  $di/dt(0^+)$ ,  $d^2v/dt^2(0^+)$  if  $v(t)=u(t)$ . (7M)



**II B. Tech I Semester Supplementary Examinations, July - 2022****ELECTRONIC DEVICES AND CIRCUITS**

(Com to ECE, EIE, ECT)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions each Question from each unitAll Questions carry **Equal** Marks

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- 1 a) Explain about Hall effect. Derive an expression for Hall voltage. What are the applications of Hall effect? [9M]
- b) Explain in detail about the extrinsic and intrinsic semiconductors. [5M]
- Or
- 2 a) Derive an expression for total current in a semiconductor. [7M]
- b) Draw the Energy band diagram of PN diode and also Explain. [7M]
- 3 a) Explain the construction and working of Photo diode. [7M]
- b) Explain construction and operation of full wave rectifier with L section filter? [7M]
- Or
- 4 a) Explain construction and operation of a bridge rectifier and find PIV, RMS current, Rectifier efficiency & Ripple factor. [7M]
- b) Discuss how full wave rectification differs from half wave rectification. [7M]
- 5 a) With neat sketch explain the operation & Drain, Gate characteristics of Depletion MOSFET. [7M]
- b) Explain about punch through effect? [7M]
- Or
- 6 a) Explain how the transistor acts as an amplifier? [7M]
- b) Compare & contrast BJT & FET. [7M]
- 7 a) Explain the need for biasing in electronic circuits. What are the factors affecting the stability factor. [7M]
- b) Derive the equation for stability factor for fixed bias. [7M]
- Or
- 8 a) Determine the quiescent currents and the collector to emitter voltage for a Ge transistor with $\beta = 50$ in the self-biasing arrangements. The circuit component values are $V_{CC} = 20V$, $R_C = 2k\Omega$, $R_E = 0.1 k\Omega$, $R_1 = 100 k\Omega$ and $R_2 = 5 k\Omega$. Find the stability factor S. [7M]
- b) Explain in detail about Thermal Runaway & Thermal Stability concepts. [7M]
- 9 Derive the expressions for voltage gain, current gain, input impedance, output impedance, with respect to source and current gain W.r.to source for generalized transistor amplifier at low frequencies. [14M]
- Or
- 10 a) Give the comparison of CE, CB and CC amplifiers with respect to voltage gain, current gain, input impedance and output impedance. [7M]
- b) Compare CS, CD JFET amplifiers. [7M]

II B. Tech I Semester Supplementary Examinations, July - 2022
SWITCHING THEORY AND LOGIC DESIGN
 (Com to ECE, EIE)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions each Question from each unit

All Questions carry **Equal** Marks

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- 1 a) Represent decimal number 6027 in [4M]  
       (i) BCD           (ii) excess-3 code  
 b) Express the decimal 324 in Gray code form. [3M]  
 c) Discuss in brief about error detecting and correcting codes. [8M]

Or

- 2 a) What are universal gates? Why these gates are called as universal gates? [4M]  
 b) Draw the pin diagram and obtain truth table for IC 7400. [4M]  
 c) Simplify the following expression and implement them with two level NAND gate circuits. [7M]  
 $BD + BCD^1 + AB^1C^1D^1$

- 3 a) Find the minimal sum-of-products expression for [7M]  
 $f(w,x,y,z) = \prod(1,4,5,6,11,12,13,14,15)$   
 b) Briefly explain the tabulation procedure for the determination of prime implicants. [6M]  
 c) What is the advantage of tabular method? [2M]

Or

- 4 a) Draw and explain the operation of a full adder circuit using two half adder circuits. [5M]  
 b) Design a code converter that converts BCD to excess-3 code. [10M]
- 5 a) Implement the following Boolean function using 8:1 multiplexer. [9M]  
 $F(A, B, C, D) = \bar{A} B \bar{D} + ACD + \bar{B}CD + \bar{A} \bar{C}D$   
 b) What is meant by an encoder? Explain it with a block diagram. [6M]

Or

- 6 a) List the applications of PROM, PLA and PAL. [5M]  
 b) Implement the following Boolean functions using PLA. [10M]  
 $f_1(w, x, y, z) = \sum(0,1,3,5,9,13)$   
 $f_2(w, x, y, z) = \sum(0,2,4,5,7,9,11,15)$
- 7 a) Write a brief note on IC 7474. [3M]  
 b) Draw the logic diagram of a serial-in, Parallel-out shift register and explain its operation. [6M]  
 c) Draw and explain the operation of four bit Johnson counter. [6M]

Or

- 8 a) Distinguish between combinational and sequential circuits. [5M]  
 b) Design a synchronous 3-bit UP counter using T flip-flops. [10M]
- 9 For the state table of machine given below, find the equivalence partition and a corresponding reduced machine in standard form. [15M]

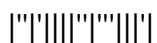
Table: State table

| PS | NS, Z |       |
|----|-------|-------|
|    | X = 0 | X = 1 |
| A  | F,0   | B,1   |
| B  | F,0   | A,1   |
| C  | D,0   | C,1   |
| D  | C,0   | B,1   |
| E  | D,0   | A,1   |
| F  | E,1   | F,1   |
| G  | E,1   | G,1   |

Or

- 10 a) Briefly explain about Mealy and Moore machines. [6M]  
 b) Convert the following Mealy machine into a corresponding Moore Machine. [9M]

| PS | NS  | Z   |
|----|-----|-----|
|    | X=0 | X=1 |
| A  | C,0 | B,0 |
| B  | A,1 | D,0 |
| C  | B,1 | A,1 |
| D  | D,1 | C,0 |





**II B. Tech I Semester Supplementary Examinations, July - 2022**  
**SWITCHING THEORY AND LOGIC DESIGN**  
 (Com to ECE, EIE and ECC)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **FOUR** Questions from **Part-B**

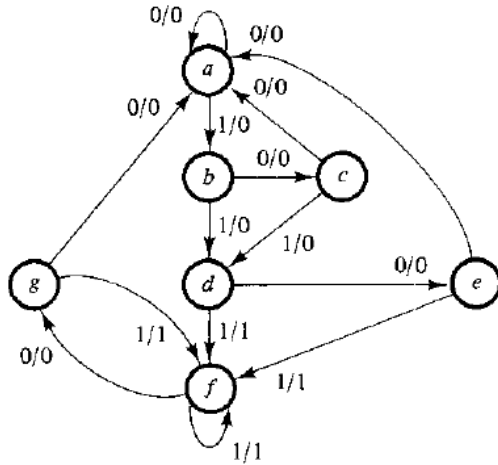
**PART -A**

1. a) Express -123 as an 8-bit signed magnitude number. (2M)
- b) Apply associative law of addition to  $A+(B+C+D)$ . (2M)
- c) Draw the block diagram of a full adder using two half adders and a gate. (3M)
- d) Compare PROM and PAL. (2M)
- e) What is race around condition in JK flip flop and suggest a remedy? (3M)
- f) What is a distinguishing sequence? (2M)

**PART -B**

2. a) Implement the function  $F = AB + CD$  using NAND-NAND realization. (5M)
- b) Using 2's complement perform the following  $(42)_{10} - (68)_{10}$  and express the result in hexa decimal form. (4M)
- c) Determine the single bit error- correcting code for the information 10110 for even parity. (5M)
3. a) Design a Excess-3 to BCD code converter. (9M)
- b) Simplify the following expression  $f = \Pi M (1,4,5,11,12,14)+d(6,7,15)$  using k-map. (5M)
4. a) Design and implement 4-bit digital comparator. (7M)
- b) Implement a 2-to-4 line decoder. (7M)
5. a) Implement a full subtractor using PROM. (7M)
- b) Implement the following Boolean functions using PLA.  
 $X = \sum m (0,2,4,7), Y = \sum m(1,3,5,7)$  (7M)
6. a) Convert T flip-flop to D flip-flop. (5M)
- b) Design and implement a mod 4 ring counter. (9M)

7. A sequential circuit is represented by the state diagram shown in figure below. Obtain its reduced state table and state diagram. Also complete state assignment. (14M)



**II B. Tech I Semester Supplementary Examinations, July - 2022**  
**ELECTRICAL TECHNOLOGY**  
 (Com. to ECE, EIE)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **THREE** Questions from **Part-B**

**PART -A**

1. a) Defined field energy and co- energy. 4M
- b) What are the different types of DC generator? 3M
- c) Give the significance of back emf in a DC motor. 4M
- d) What is meant by a transformer? 3M
- e) List out starting methods of 3-phase induction motor. 4M
- f) What are the different types of single-phase induction motors? 4M

**PART -B**

2. a) Describe the principle of energy conversion. From a consideration of the various energies involved, develop the model of an electromechanical energy device. (8M)
- b) Find an expression for the magnetic force developed in a double excited translational magnetic system. (8M)
3. a) Explain the construction features of a DC machine with the help of neat sketches. (8M)
- b) A 4-pole, long shunt, lap wound generator supplies 25kW at a terminal voltage of 500V. The armature resistance is 0.03ohms, series field resistance is 0.04ohms, and shunt field resistance is 200 ohms. The brush drop may be taken as 1V. Determine the emf generated. (8M)
4. a) Derive an expression for torque developed in the armature of DC motor. (6M)
- b) Explain step by step procedure to pre- determine the efficiency of shunt motor by conducting suitable test. (10M)
5. a) From the fundamentals, derive the expression for the EMF equation of a single-phase transformer. (7M)
- b) A 3300/300 V single phase transformer gives 0.6A and 60W as ammeter and wattmeter readings when supply is given to the low voltage winding and high voltage winding is kept open, find (9M)
  - (i) power factor of no-load current, (ii) Magnetizing Component, and
  - (iii) Iron loss component
6. a) Explain the slip-torque characteristics of 3-phase induction motor. (7M)
- b) Explain the starting of an Induction motor by using an auto transformer starter with neat diagram. (9M)
7. a) Explain the principle of operation of single phase induction motor using two revolving field theory. (9M)
- b) Describe the working principle of AC servomotor. (7M)

**II B. Tech I Semester Supplementary Examinations, July - 2022**  
**SWITCHING THEORY AND LOGIC DESIGN**  
 (Com to ECE, EIE, ECT)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions each Question from each unit  
 All Questions carry **Equal** Marks

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- 1 a) Convert the following (i) $(123.589)_{10} = ()_8$. [7M]
 (ii) $(1011011111101.10101)_2 = ()_{16}$
 - b) Represent +35 and -35 in sign magnitude, sign 1's complement and sign 2's complement representation. [4M]
 - c) Convert $(525)_{10}$ into its Excess-3 code. [3M]
- Or
- 2 a) Find the complement of the following and show that $F.F'=0$ and $F+F'=1$ [8M]
 (i) $F=XY'+X'Y$
 (ii) $F=(X+Y'+Z)(X'+Z')(X+Y)$
 - b) What are universal gates? Why these gates are called as universal gates? [3M]
 - c) What are the applications of Boolean algebra? [3M]
- 3 a) Find the minimal sum of products for the Boolean expression, [10M]
 $f = \sum m(1,2,3,5,7,8,9,10,12,14,15)$, using the K-Map.
 - b) What is the advantage of tabular method? [2M]
 - c) Explain the term prime implicant. [2M]
- Or
- 4 a) Design and implement 4-bit Binary Adder/subtractor. [10M]
 - b) What is a full/subtractor? Write its truth table. [2M]
 - c) List the applications of full adders. [2M]
- 5 a) With the help of a logic diagram and a truth table, explain a 3-line to 8-line decoder. [7M]
 - b) Draw the pin diagram of an IC 7447 and also write its truth table. [4M]
 - c) What is multiplexer? List the applications of multiplexers. [3M]
- Or
- 6 a) Design a combinational circuit using PROM that accepts 3-bit binary number and generates its equivalent excess-3 code. [10M]
 - b) Briefly explain about PLDs. [4M]

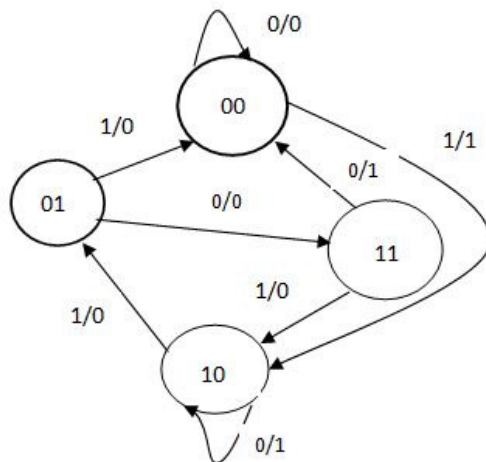
- 7 a) Design a 4-bit synchronous counter with T flip-flops. [10M]
 b) Write a short notes on [4M]
 (i) IC 7490 (ii) IC 74121

Or

- 8 a) Convert SR flip-flop to JK flip-flop with an example. [10M]
 b) Write the differences between combinational and sequential circuits. [4M]
- 9 a) With the help of State table and State diagram explain the operation of Sequence generator. [7M]
 b) With an example explain the procedure for conversion of Moore machine to Mealy machine. [7M]

Or

- 10 a) A sequential circuit has one input and one output .The state diagram is shown below. Design the sequential circuit with RS flip-flop. [10M]



- b) Distinguish between Moore and Mealy Machines. [4M]

II B. Tech I Semester Supplementary Examinations, July - 2022
SIGNALS AND SYSTEMS
 (Com to ECE, EIE)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions each Question from each unitAll Questions carry **Equal** Marks

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- 1 a) What is the classification of system? Verify whether the system described by the equation :  $y(t)=x(t)^2$  is linear and time invariant. [8M]  
 b) Test if the two signals  $x_1(t) = A \cos 100t$  ,  $x_2(t) = 2A \cos 200t$  are orthogonal in the interval  $0 < t < T$  where  $T$  is time period of  $x_1(t)$ . [7M]

Or

- 2 a) Explain orthogonality property between two complex functions  $f_1(t)$  and  $f_2(t)$  for a real variable  $t$ . [7M]  
 b) Find the even and odd components of the signals [8M]  
     i.  $x(t) = t u(t)$                       ii.  $x(t) = \cos(\omega_0 t + n/3)$ .
- 3 a) Bring out the relationship between Trigonometric and Exponential Fourier series. [8M]  
 b) An AM signal is given by [7M]  
 $f(t) = 15 \sin (2\pi 10^6 t) + [ 5 \cos 2\pi 10^3 t + 3 \sin 2\pi 10^2 t ] \sin 2\pi 10^6 t$ .  
 Find the Fourier Transform and draw its spectrum.

Or

- 4 a) Write the Dirichlet's conditions to obtain Fourier series representation of any signal. [8M]  
 Find the Fourier transform of  $x(t) = e^{j2\pi ft}$ .  
 b) Signal  $x(t)$  has Fourier Transform  $x(f) = [ j2\pi f ] / [ 3 + ( j / 10 ) ]$  . What is total net area [7M]  
 under the signal  $x(t)$ .
- 5 a) List and prove any five properties of convolution integral. [8M]  
 b) Find the impulse response of the RC high pass filter shown in figure. Also find the [7M]  
 transfer function.

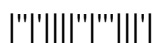
Or

- 6 a) For an LTI system with impulse response  $x(t) = u(t - 2)$  . Determine the response [8M]  
 of system for the input  $x(t) = u(t + 1)$  .  
 b) Find the impulse response of the RC low pass filter shown in figure. Also find the [7M]  
 transfer function. What would be its frequency response?
- 7 a) A continuous time signal is given as  $x(t) = 8\cos(200\pi t)$ , Determine [8M]  
     i) Minimum sampling rate ii) If  $f_s = 400\text{Hz}$ , what is discrete time signal obtained  
     after sampling. iii) If  $f_s = 150\text{Hz}$ , what is discrete time signal obtained after sampling.  
 b) State and prove the properties of auto correlation function [7M]

Or

- 8 a) List the properties of Auto correlation. Prove any of two. [8M]  
 b) Determine the auto and cross correlation and PSD and ESD of the following signal [7M]  
 $x(t) = A \sin(\omega_t + \phi)$ .
- 9 a) Find the Laplace transform following signals and its ROC [8M]  
 (i)  $e^{-5t} [u(t) - u(t - 5)]$  (ii)  $x(t) = e^{-2t} (4 \cos 5t - 3 \sin 5t) u(t)$ .  
 b) Determine the inverse Z transform of [7M]  
 $X(z) = \frac{z}{3z^2 - 4z + 1}$  if ROC is (a)  $|z| > 1$  (b)  $|z| < \frac{1}{3}$  (c)  $\frac{1}{3} < |z| < 1$
- Or
- 10 a) Find the Laplace transform of [8M]  

$$\int_0^t \frac{e^{-t} \sin t}{t} dt$$
  
 a)  $\frac{1 - e^{-2t}}{t}$   
 b)  $\frac{1 - e^{-2t}}{t}$   
 b) State and prove Linearity, time shifting and time convolution properties of Z – [7M]  
 Transform.



**II B. Tech I Semester Supplementary Examinations, July - 2022****ELECTRONIC DEVICES AND CIRCUITS**

(Com to ECE, EIE and ECC)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **FOUR** Questions from **Part-B**

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PART -A

1. a) Write the differences between intrinsic semiconductors and extrinsic semiconductors. (3M)
- b) Draw the symbol of Photo diode and write its applications. (2M)
- c) Give the expression for ripple factor and efficiency for full wave rectifier with and without capacitor filter. (2M)
- d) List out the differences between JFET and MOSFET. (3M)
- e) Mention the advantages and disadvantages of self-bias method. (2M)
- f) Draw the h-parameter model of a transistor under CE configuration. (2M)

PART -B

2. a) Explain about Fermi level in intrinsic and extrinsic Semiconductors with the help of energy band diagrams. (7M)
- b) Derive expression for current density of an intrinsic semiconductor. (7M)
3. a) Derive the expression for transition capacitance in a PN diode. (7M)
- b) Explain the working of Zener diode and its V-I characteristics. And what is the sufficient condition for regulation. (7M)
4. a) Design a full wave rectifier with inductive filter and derive the ripple factor and show the wave form. (7M)
- b) A diode having internal resistance $R_f = 20\Omega$ is used for half-wave rectification. If the applied voltage $v = 50 \sin \omega t$ and load resistance $R_L = 800 \Omega$, find : (7M)
(i) I_m , I_{dc} , I_{rms} (ii) ripple factor (iii) efficiency
5. a) From the transistor current components, derive the current equation of transistor with a neat sketch. (7M)
- b) An FET has a drain current of 4 mA. If $I_{dss} = 8\text{mA}$ and $V_{gs}(\text{off}) = -6\text{V}$, find the value of V_{gs} and V_p . (7M)
6. a) Draw the circuit diagram of Fixed bias circuit of CE amplifier and derive expression for S , S^I and S^{II} . (7M)
- b) Explain about i) Thermistor Compensation (7M)
ii) Sensistor Compensation
7. a) Draw the circuit diagram of common source amplifier and derive expression for voltage gain, current gain, input impedance and output admittance. (7M)
- b) The CE amplifier has the following specifications. $h_{ie} = 1100 \text{ ohms}$, $h_{re} = 2.5 \times 10^{-4}$, $h_{fe} = 50$, $h_{oe} = 24 \mu\text{A/V}$ if $R_L = 10\text{Kohms}$ and $R_s = 1\text{k ohm}$. Find the various gains and input impedances and output impedances. (7M)



II B. Tech I Semester Supplementary Examinations, July - 2022
ELECTRONICS DEVICES AND CIRCUITS
 (COM. TO ECE, EIE, ECC)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**
- ~~~~~

PART -A

1. a) What is Fermi Dirac function? (3M)
- b) What is Photo diode? Give applications? (4M)
- c) Derive expression for the efficiency of a Half wave rectifier circuit . (4M)
- d) Write comparison between JFET and MOSFET. (4M)
- e) How thermal runaway exists? (3M)
- f) Define two port network. Give details about it. (4M)

PART -B

2. a) Explain in detail about Hall Effect. Derive hall quotient. (8M)
- b) Find the concentration of holes & electrons in the P-type silicon at 300⁰K assuming its resistivity as $0.02\Omega\text{-cm}$, $\mu_p=475\text{cm}^2/\text{vs}$, $\eta_i=1.45\times10^{10}/\text{cm}^3$. (8M)
3. a) Explain the working of Tunnel diode and its V-I characteristics. And what is the sufficient condition for tunneling. (8M)
- b) The current through silicon diode is $I_f=50\text{ mA}$ in a forward bias of $V_f=0.6\text{V}$. Calculate the static resistance. (8M)
4. a) With necessary waveforms, Explain the operation of bridge rectifier. (8M)
- b) A full-wave rectifier has an output dc voltage of 150 V along with unwanted ripple voltage $V_r(\text{rms}) = 15\text{ V}$. If a C-R-C filter is used between the rectifier and a load of 5000 ohms, calculate the ripple factor at load. Assume that filter has the component values in the same order as 15 μF , 500 ohms, and 10 μF . (8M)
5. a) Discuss the operation of enhancement MOSFET at different regions with suitable figures and equations. (8M)
- b) Given a depletion type MOSFET with $I_{DSS} = 9\text{ mA}$ and $V_p = -3\text{V}$, determine the drain current at $V_{GS} = -1\text{ V}$, 0 V, 1V, and 2 V. Compare the difference in current levels between -1 and 0 V with the difference between 1 and 2 V. In the positive V_{GS} region, does the drain current increases at a significantly higher rate than for negative values? Is there a linear or nonlinear relationship between I_D and V_{GS} ? Explain. (8M)

6. a) Draw the circuit diagram of fixed bias and derive the expression for Stability factor for it. (8M)
- b) An NPN transistor if $\beta=50$ is used in common emitter circuit with $V_{cc}=10V$ and $R_c=2k\Omega$. The bias is obtained by connecting $100k\Omega$ resistor from collector to base. Find the quiescent point and stability factor. (8M)
7. a) Compare A_V , A_I , R_i and R_o of CE, CB and CC configurations. (8M)
- b) Determine the h-parameters for common emitter configuration from the characteristic curves. (8M)



II B. Tech I Semester Supplementary Examinations, July - 2022
SIGNALS AND SYSTEMS
 (Com to ECE, EIE, ECT)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions each Question from each unit
 All Questions carry **Equal** Marks

~~~~~

- 1 a) Find whether the following signals are even or odd : [7M]  
       (i)  $e^{4t}$        (ii)  $u(t+2) - u(t-2)$        (iii)  $u(-n+2)u(n+2)$   
 b) Define orthogonal signal space and explain clearly its application in representing a signal. [7M]

Or

- 2 a) Distinguish between [7M]  
       (i) Continuous-time and discrete-time systems  
       (ii) Static and dynamic systems  
       (iii) Causal and Non-Causal systems  
 b) Verify whether  $x(t) = Ae^{-\alpha t} \cdot u(t)$ ,  $\alpha > 0$  is an energy signal or not. [7M]
- 3 a) Obtain the Fourier transform of the following functions. (i) Unit step function, (ii) Unit impulse function. [7M]  
 b) Find the complex exponential Fourier series coefficient of the signal [7M]  
        $x(t) = \sin 3\pi t + 2\cos 4\pi t$

Or

- 4 a) Explain the Fourier transform of signum function and also sketch. Its magnitude and phase spectra. [7M]  
 b) What is the Significance of Hilbert Transform? Explain in detail. [7M]
- 5 a) Explain the characteristics of an ideal LPF? All ideal filters are physically not realizable: justify. [7M]  
 b) What is an LTI system? Explain the properties involved. Check whether an ideal differentiator is LTI or not. [7M]

Or

- 6 a) Prove that the Transmission of a pulse through a Low Pass Filter causes the dispersion of the pulse. [7M]  
 b) Derive the relation between bandwidth and rise time. [7M]
- 7 a) State and prove the sampling theorem for low pass signals. [7M]  
 b) Explain the detection of periodic signals in the presence of noise by cross-correlation. [7M]

Or

- 8 a) Compare various sampling methods. [7M]  
 b) Verify Parseval's theorem for the energy of the signal  $x(t) = e^{-3t}u(t)$ . [7M]
- 9 a) State and prove time convolution property of Laplace Transform. [7M]  
 b) Find the Z transform of  $x[n] = a^{n+1}u[n+1]$ . [7M]
- Or
- 10 a) Obtain the Laplace transform of  $x(t) = e^{-at} \cos(\omega_0 t) u(-t)$  and indicate its ROC. [7M]  
 b) Find the Z Transform of  $x[n] = na^{n-1}u[n]$ . [7M]

**II B. Tech I Semester Supplementary Examinations, July - 2022**  
**RANDOM VARIABLES AND STOCHASTIC PROCESSES**  
 (Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions each Question from each unitAll Questions carry **Equal** Marks

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- 1 a) State and prove the theorem of total probability. [8M]
 b) A random variable X has the following probability distribution. [7M]

x	-2	-1	0	1	2	3
$f(x)$	0.15	0.2	K	0.2	$2K$	0.3

Find K and the CDF of X .

Or

- 2 a) If the density function of a continuous random variable is given by [8M]

$$f_X(x) = \begin{cases} ax, & 0 \leq x \leq 1 \\ a, & 1 \leq x \leq 2 \\ 3a - ax, & 2 \leq x \leq 3 \\ 0, & \text{otherwise} \end{cases}$$

- i. Find the value of a
 ii. Find $P(X > 1)$
 b) List any seven properties of CDF of a random variable, X . [7M]
 3 a) When two coins are tossed, the random variable is taken to be the number of heads that result. Find the mean value of this random variable. [8M]
 b) A random variable Y is related to the random variable X by $Y = 3X - 4$. Find the PDF of Y , if $f_X(x) = \exp(-2|x|)$; $-\infty < x < \infty$. [7M]

Or

- 4 a) Show that n^{th} moment can be evaluated from the characteristic function. [8M]
 b) Find the mean value of exponential random variable. [7M]
 5 a) List all the properties of joint CDF of two random variables X and Y . [7M]
 b) The joint PDF of X and Y is given by [8M]

$$f_{XY}(x, y) = \begin{cases} \frac{Kxy}{100}; & 0 \leq x \leq 4, \quad 0 \leq y \leq 3 \\ 0; & \text{otherwise} \end{cases}$$

- i. Find the value of constant, K .
 ii. Find the marginal PDF of X .

Or

- 6 a) Derive the relation between correlation and covariance of two random variables X and Y . [8M]
 b) Two random variables X and Y are transformed by the relations [7M]

$$V = 5X + 3Y \\ W = 2X - 3Y$$

Find $f_{VW}(v, w)$.

- 7 a) Give the classification of random processes based on statistical characteristics. [7M]
b) Is the following random process WSS? [8M]

$$X(t) = A \cos(\omega_o t + \Theta)$$

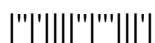
where A and ω_o are real constants, and Θ is a random variable uniformly distributed over $(0, \pi)$. *Hint: one of the sample functions of $X(t)$ is given by $x(t) = A \cos(\omega_o t + \theta)$.*

Or

- 8 a) Show that the maximum value of autocorrelation function is $R_{XX}(0)$. [8M]
b) Define the ergodicity of a random process. Give one example. [7M]
- 9 a) Derive the relation between autocorrelation of output and autocorrelation of input of an LTI system with a WSS process as input. [8M]
b) State and prove any two properties of power spectral density of $X(t)$. [7M]

Or

- 10 a) Derive the expression for cross-correlation between output and input of an LTI system with a WSS process as input. [8M]
b) Show that $S_{YY}(\omega) = |H(\omega)|^2 S_{XX}(\omega)$. [7M]



II B. Tech I Semester Supplementary Examinations, July - 2022
RANDOM VARIABLES & STOCHASTIC PROCESS
 (Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **FOUR** Questions from **Part-B**

PART -A

1. a) What are the conditions for a function to be a random variable? (2M)
- b) Define correlation coefficient of joint random variable. (2M)
- c) What is Transformation? Classify the different types Transformation of Random Variable. (3M)
- d) State the conditions for a WSS random process. (2M)
- e) A random process has ACF $R_X(\tau) = \cos \omega_0 \tau$. Find its power density spectrum. (3M)
- f) Explain the term average noise figure. (2M)

PART -B

2. a) The random variable X has the discrete variable in the set $\{-1, 0.5, 0.7, 1.5, 3\}$, the corresponding probabilities are assumed to be $\{0.1, 0.2, 0.1, 0.4, 0.2\}$ plot its distribution function. (7M)
- b) Define conditional probability distribution function and write the properties. (7M)
3. a) State and prove the properties of moment generating function. (7M)
- b) Let X be a Poisson random variable then Find out its mean and variance. (7M)
4. a) State central limit theorem for the following cases: (7M)
 - i) Equal distributions ii) Unequal distributions
- b) List all the properties of jointly Gaussian random variables. (7M)
5. a) Define autocorrelation function of a random process and write its properties. (7M)
- b) Explain stationary and ergodic random processes. (7M)
6. a) Define cross power spectral densities and list all the properties of cross PSDs. (7M)
- b) A WSS random process X(t) which has the power spectral density, (7M)

$$S_{XX}(w) = \frac{w^2}{w^4 + 10w^2 + 9}$$
 Find the auto correlation and mean square value of the process.
7. a) Find the noise band width of a system having the transfer function (7M)

$$|H(w)|^2 = \frac{1}{1 + \left(\frac{w}{w_0}\right)^4}$$
 where w_0 is a real constant.
- b) Derive the expression for effective noise temperature of a cascaded system in terms of its individual input noise temperature. (7M)



II B. Tech I Semester Supplementary Examinations, July - 2022
RANDOM VARIABLES AND STOCHASTIC PROCESSES
 (Com to ECE, ECT)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions each Question from each unit
 All Questions carry **Equal** Marks

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- 1 a) Write the properties of Gaussian density curve. Find the maximum value of Gaussian density function. [7M]  
 b) A random variable X has pdf  $f_X(x) = k(1 + x^2)$ , for  $0 \leq x \leq 1$ . Find the constant k and distribution function of random variable. [7M]

Or

- 2 a) Define and explain the following with an example: (i) Discrete sample space [7M]  
 (ii) Conditional probability (iii) Continuous random variable.  
 b) The random variable X has the discrete variable in the set  $\{-1, -0.5, 0.7, 1.5, 3\}$  the corresponding probabilities are assumed to be  $\{0.1, 0.2, 0.1, 0.4, 0.2\}$ . Plot its distribution function and state is it a discrete or continuous distribution function. [7M]

- 3 a) Find the moment generating function of the random variable X whose moments are  $m_r = (r + 1)! 2^r$  [7M]  
 b) State and prove the properties of variance of a random variable. [7M]

Or

- 4 a) What is meant by expectation? State and prove its properties. [7M]  
 b) A random variable X has pdf  $f_X(x) = (1/b)e^{-(x-a)/b}$ . Find its characteristic function. [7M]

- 5 a) State and prove the properties of joint density function. [7M]  
 b) Given the function  $f_{XY}(x, y) = \begin{cases} b(x + y)^2, & -2 < x < 2, -3 < y < 3; \\ 0, & elsewhere \end{cases}$  [7M]

Find the constant b such that this is a valid joint density function. Determine the marginal density functions.

Or

- 6 a) A joint sample space for two random variables X and Y has four elements (1,1), (2,2), (3,3) and (4,4). Probabilities of these elements are 0.1, 0.35, 0.05, and 0.5 respectively. (i) Determine through logic and sketch the distribution function  $F_{XY}(x, y)$  (ii) Find the probability of the event  $\{x \leq 2.5, y \leq 6\}$  (iii) Find the probability of the event  $\{x \leq 3\}$  [7M]  
 b) Find the density function of  $W = X + Y$ , where the densities of X and Y are assumed to be: [7M]

$$f_X(x) = 0.5[u(x) - u(x - 2)]; f_Y(y) = 0.25[u(y) - u(y - 4)]$$

7 a) Define a random process. Write the classification of random process by the form of its sample functions and explain. [7M]

b)  $X(t)$  and  $Y(t)$  are real random processes that are jointly WSS. Prove the following [7M]  
 (i)  $R_{XY}(\tau) = \sqrt{R_{XX}(0)R_{YY}(0)}$  (ii)  $R_{XY}(\tau) \leq \frac{1}{2}[R_{XX}(0) + R_{YY}(0)]$

Or

8 a) Explain the following with respect to Random processes [7M]

- (i) Strict sense stationarity
- (ii) Mean Ergodic processes

b) Consider a random process  $X(t) = A \cos(wt)$ , where 'w' is a constant and A is a random variable Uniformly distributed over (0,1). Find the autocorrelation and auto - covariance of  $X(t)$  [7M]

9 a) State and prove the relationship between Power Density Spectrum and Autocorrelation Function. [7M]

b) Define the following random processes [7M]  
 (i) Band pass process  
 (ii) Band limited process  
 (iii) Narrow band process

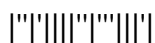
Or

10 a) If  $X(t)$  is a stationary process, find the power spectrum of  $Y(t) = A_0 + B_0 X(t)$  in term of the power spectrum of  $X(t)$  if  $A_0$  and  $B_0$  are real constants. [7M]

b) A random process  $Y(t)$  has the power spectral density [7M]

$$S_{YY}(\omega) = \frac{9}{\omega^2 + 64}$$

Find i) The average power of the process ii) The Auto correlation function.





**II B. Tech I Semester Supplementary Examinations, July - 2022**  
**OBJECT ORIENTED PROGRAMMING THROUGH JAVA**  
(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 75

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Answer any **FIVE** Questions each Question from each unit

All Questions carry **Equal** Marks

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- 1 a) Describe the types of Constructors supported in JAVA. [8M]
b) Discuss the need for over ridding methods. [7M]

Or

- 2 a) Explain about Abstraction & Dynamic Binding. [8M]
b) Write about need for OOP. [7M]

- 3 a) Define multiple inheritance. Explain how Java Support multiple inheritance? [8M]
b) Write java program to implement the multilevel Inheritance. [7M]

Or

- 4 a) Discuss in detail about nested Interfaces. [8M]
b) Explain any four methods in java.util Package. [7M]

- 5 a) Discuss about Text Fields and Text Areas. [8M]
b) Explain about Flow Layout Manager. [7M]

Or

- 6 a) Explain life cycle of an Applet with neat diagram. [8M]
b) Write a sample Java program to show how to create Combo boxes and labels. [7M]

- 7 a) Differentiate between Output Stream and Input Stream. [8M]
b) What is a file? Explain file access modes. [7M]

Or

- 8 a) Write about Random Access Files. [8M]
b) Differentiate between File Writer and File Reader. [7M]

- 9 a) Discuss about try with multiple catch statements. [8M]
b) Describe in detail about thread life cycles. [7M]

Or

- 10 a) Compare and contrast multithreading and multitasking. [7M]
b) Explain the built in exceptions in java. [8M]

II B. Tech I Semester Supplementary Examinations, July - 2022**SIGNALS & SYSTEMS**

(Com to ECE, EIE and ECC)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **FOUR** Questions from **Part-B**

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**PART -A**

1. a) Briefly discuss about orthogonality in complex functions. (3M)
- b) Define Hilbert Transform? What are its applications? (2M)
- c) What are the different ways to avoid aliasing? (2M)
- d) Check whether the continuous time system given by  $y(t) = \sin x(t)$  is time invariant or not? (3M)
- e) Prove the time scaling property of Laplace transform. (2M)
- f) Prove the time shifting property of Z-transform. (2M)

**PART -B**

2. a) Derive the expression for mean square error in approximating a function  $f(t)$  by a set of “ $n$ ” orthogonal functions. (7M)
- b) Show that the following systems are LTI systems? (7M)  
 i)  $y(t)=x(t/2)$     ii)  $y(t)=x(t)+x(t-2)$  for  $t \geq 0$  and 0 for  $t \leq 0$
3. a) Derive Fourier transform from Fourier series. (6M)
- b) Find the Fourier Transform of the signal  $x(t) = e^{at} u(-t)$  (8M)
4. a) What is aperture effect? Why the samples get aperture effect at the top? How it can be reduced? (7M)
- b) The signal  $x(t) = \cos 100\pi t + 0.5 \cos 500\pi t$  is sampled at the rate of 200 samples per second. The sampled signal is passed through an ideal lowpass filter with 100Hz bandwidth. What is the filter output? Also sketch the frequency spectrum of the sampled waveform. (7M)
5. a) Derive the condition for distortion less transmission through the system. (7M)
- b) Compute the auto-correlation function and energy spectral density of  $x(t) = e^{-at} u(t)$  (7M)
6. a) Determine the inverse Laplace transform of  $\frac{1}{(s+1)(s+5)}$  (7M)
- b) State and prove initial and final value theorems of Laplace transform. (7M)
7. a) Determine the inverse Z-transform of the sequence  $X(z) = \cos(3z)$ ; ROC  $|z| < \infty$  (7M)
- b) Compare and contrast Laplace, Fourier and z-transforms. (7M)

**II B. Tech I Semester Supplementary Examinations, July - 2022****SIGNALS AND SYSTEMS**

(Com. to ECE, EIE, ECC)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **THREE** Questions from **Part-B****PART -A**

1. a) Prove that  $\delta(n) = u(n) - u(n-1)$  (4M)
- b) What are the advantages and drawbacks of Flat Top sampling? (3M)
- c) What is the relation between Bandwidth and Rise time? (3M)
- d) Write properties of Energy Spectral Density (ESD). (4M)
- e) Give the Relationship between Laplace Transform and Fourier Transform. (4M)
- f) State convolution property of Z transform. (4M)

**PART -B**

2. a) A Discrete time System is given as  $y(n) = y_2(n-1) = x(n)$ . A bounded input of  $x(n) = 2^n$  is applied to the system. Assume that the system is initially relaxed. Check whether the system is stable or unstable. (8M)
- b) A rectangular function defined by  $f(t)$ , approximate  $f(t)$  by a single sinusoid  $\sin t$ , and Evaluate Mean square error in this approximation. (8M)
3. a) State Dirichlet's conditions. Also explain its importance. (8M)
- b) Obtain the Fourier transform of the following functions. (8M)
  - i. Impulse function  $f(t)$ .
  - ii. DC Signal.
  - iii. Unit step function
  - iv. Signum Function
4. a) What is an LTI system? Explain its properties. Derive an expression for the Transfer function of an LTI system. (8M)
- b) Discuss about Poly-Wiener criterion for physical realization. (8M)
5. a) A filter with  $H(\omega) = 1/(1+j\omega)$  is given an input  $x(t) = e^{-2t} u(t)$ . Find Energy density spectrum of the output. (8M)
- b) Find the cross correlation of the functions  $\sin \omega t$  and  $\cos \omega t$ . (8M)
6. a) Find out the inverse Laplace Transform of (8M)
 
$$X(s) = \frac{s-2}{s(s+1)^3}$$
- b) Explain the Frequency differentiation and Time convolution properties of Laplace transforms. (8M)
7. a) Determine the inverse z transform of the following function (8M)
 
$$x(z) = 1/(1+z^{-1})(1-z^{-1})^2 \text{ ROC : } |Z| > 1$$
- b) Explain the properties of the region of convergence of  $X(z)$ . (8M)

**II B. Tech I Semester Supplementary Examinations, July - 2022****MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS**

(Com to EEE, ECE, EIE, MIN)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions each Question from each unitAll Questions carry **Equal** Marks

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- 1 a) Elucidate the importance of Managerial Economics and its various features. [8M]
b) Discuss different methods of demand forecasting with suitable examples. [7M]

Or

- 2 a) Define elasticity of Demand? Explain the types of Elasticity of Demand. [8M]
b) Elaborate the concept of Supply and Law of Supply. [7M]
- 3 a) Describe the concepts of Returns to scale and Economies of scale in detail. [8M]
b) Explicate several types of cost with examples. [7M]

Or

- 4 a) Explain the term "Breakeven" and "Locus point"? [8M]
Bremend Ltd manufactures a computer stand. It has fixed costs of \$500,000 and each stand sells for \$120, with a variable cost of \$70 per unit. The factory has a maximum capacity of 20,000 units and it anticipates selling 15,000 units each period. Construct the break-even chart for the business, showing the break-even point, and the margin of safety.
b) Write an essay on Theories of Productions. [7M]
- 5 a) Distinguish among Perfect Competition, Monopolistic competition and Oligopolistic market. [8M]
b) Pick an industry that you believe satisfies the criteria of monopolistic market and explain and illustrate with diagrams your case for picking this industry. [7M]

Or

- 6 a) What is market skimming pricing? Explicate phases of business cycle. [8M]
b) Describe the Features of Sole Trader, Partnership and Joint Stock Company. [7M]

7 a) Explain double entry system? Prepare a proforma of final accounts. [8M]

b) Mr. Ramu has the following transactions in the month of July. [7M]
Record them into the journal and show postings in the ledger and balance the accounts.

July 1st : Ramu started business with a capital of 75,000

1st : Purchased goods from Manu on credit 25,000

2nd : Sold goods to Sonu 20,000

3rd : Purchased goods from Meenu 15,000

4th : Sold goods to Tanu for cash 16,000

5th : Goods returned to Manu 2,000

6th : Bought furniture for 15,000

7th : Bought goods from Zenu 12,000

8th : Cash paid to Manu 10,000

9th : Sold goods to Jane 13,500

20th : Cash purchases 13,500

Or

8 a) Read the following dialogue between two people: [8M]

Mr. Sun: I am not clear about what happens to my money saved in the bank. Do you know about it?

Mr. Moon: Yes I know, the bank gives loans from this money collected with it.

Mr. Sun: But does it lend all the money to the borrowers?

Mr. Moon: No it cannot do so. It even has to legally and compulsorily keep some percentage of its deposits in the form of cash and liquid assets as reserves with itself.

Which of the reserve ratio is Mr. Moon sharing with Mr. Sun? Explain that reserve and how is that used to combat inflation?

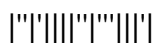
b) Write an essay on Cash Flow analysis. [7M]



- 9 a) What is capital Budgeting? Why it's important for firm to focus on capital budgeting, discuss. [8M]
- b) Consider the project with the following expected cash flows: [7M]
- | Year | Cash flow |
|------|------------|
| 0 | -\$40,000 |
| 1 | +30,000 |
| 2 | +50,000 |
| 3 | +\$200,000 |
- If the discount rate is 0%, what is the project's net present value?
If the discount rate is 5%, what is the project's net present value?
What is this project's internal rate of return?
If the reinvestment rate is 5%, what is this project's modified internal rate of return?

Or

- 10 a) Moon Ltd is planning to raise additional fund of Rs. 200000 for setting up a project. The company expects, EBIT of Rs. 80000 from the project. [8M]
- Following alternative plans are available:
- (a) To raise Rs. 200000 by way of equity share of Rs. 10 each
 - (b) To raise Rs. 100000 by way of equity shares of Rs. 10 each and Rs. 100000 by way of debt @ 10%.
 - (c) To raise Rs. 60000 by way of equity of Rs. 10 each and rest Rs. 140000 by way of 14% preferences shares.
 - (d) To raise Rs. 60000 by equity shares of Rs. 10 each, Rs. 60000 by debt @ 10% and Rs. 80000 by 14% Preference shares
- The company is in 60% tax bracket which option is best (compare EPS)?
- b) Write an essay on discounted cash flow and non-discounted cash flow method. [7M]



- 8 a) Describe the use of call by value and call by reference with suitable example. [7M]
b) Write a C++ program to initialize base class members through a derived class constructor. [8M]
- 9 a) Explain throwing and catching mechanism. [7M]
b) Define the 'this' pointer, with an example, indicate the steps involved in referring to members of the invoking object. [8M]
- Or
- 10 a) Explain generic classes in templates. [7M]
b) Write a program to create a template function for bubble sort and demonstrate the sorting of integers. [8M]

II B. Tech I Semester Supplementary Examinations, July - 2022
MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS
 (Com to EEE, ME, ECE, EIE, ECC, AME, AE and Mining Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **Four** Questions from **Part-B**
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PART -A

1. Define the following:
 - a) Law of Supply. (2M)
 - b) Opportunity Cost. (3M)
 - c) Internet Pricing. (2M)
 - d) Public Enterprise. (2M)
 - e) Current ratio. (2M)
 - f) Time value of Money. (3M)

PART -B

2. a) Explain the concept of Demand? Discuss various Demand Forecasting Methods? (7M)
- b) How to measure Price Elasticity of Demand? Explain different types of Price Elasticity? (7M)
3. a) Explain the meaning and different types of Isoquants and Isocosts? (7M)
- b) From the following data, you are required to calculate: (7M)
 - a. P/V ratio
 - b. Break-even sales with the help of P/V ratio
 - c. Sales required to earn a profit of Rs. 4,50,000

Fixed expenses	Rs.90,000
Variable cost per unit :	
Direct Material	Rs.5
Direct Labour	Rs. 2
Direct Overheads	100% of direct labour
Selling price per unit	Rs. 12

4. a) Explain the characteristics of Perfect Competition Market Structure. How price is determined under Perfect Competition? (7M)
- b) What do you mean by Average Cost Pricing, Limit Pricing and Flat Rate Pricing? (7M)
5. a) Explain the features of a Joint Stock Company. (7M)
- b) Discuss the different phases of a Business Cycle. (7M)

6. a) What are the managerial applications of Ratio Analysis? Discuss the types of Profitability Ratios? (7M)
- b) Journalize the following transactions in the books of Rajesh: (7M)
- a. Started business with a capital of Rs. 30,000
 - b. He paid into Bank Rs. 18,000
 - c. He purchased goods for cash Rs. 7,500
 - d. He withdrew cash from Bank for office use Rs. 10,000
 - e. He sold goods for cash Rs. 5,000 to Balu.
 - f. He purchased furniture for cash Rs. 3,000 from Charan & Co.,
 - g. He purchased goods from Ramu on credit for Rs. 5,000
 - h. He paid wages Rs. 4,000 for installation of a new plant purchased for Rs. 15,000.
 - i. He used goods valued at Rs. 300 of the business for his domestic purposes.
 - j. He sold goods to Kalia for Rs. 2,500 and received a cheque.
7. a) Explain the importance of Capital Budgeting? Write about IRR and PI methods. (7M)
- b) What are the sources of long-term Capital? How to appraise the profitability of a Project? (7M)

