Q.P. Code: 19HS0832

R19

Reg. No: | | | | | | | | | | |

B.Tech II Year I Semester Regular Examinations Feb / Mar 2021

PROBABILITY, NUMERICAL METHODS AND TRANSFORMS

(EEE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

1 a) Determine the probability of the following event : 4M
A non-defective bolt will be found if out of 600 bolts already examined, 12 were defective.

b) Suppose colored balls are distributed in three indistinguishable boxes as follows : 8M

	Box I	Box II	Box III
Red	2	4	3
White	3	1	4
Blue	5	3	3
Total	**10**	**8**	**10**

A box is selected at random from which a ball is selected at random. What is the probability that the ball is red?

OR

2 a) (i). Define Probability of an Event. Write the axioms of Probability. 6M
(ii). What is the Probability of getting a total of 7 or 11 when a pair fair dice are tossed?

b) State and Prove Baye's theorem. 6M

UNIT-II

3 a) Determine the root of the equation $x e^{x} - \cos x = 0$ by Regula-Falsi method. 6M

b) Using Newton's forward interpolation formula, find y at $x = 8$ from the following table 6M

x	0	5	10	15	20	25
y	7	11	14	18	24	32

OR

4 a) Using bisection method, compute the real root of the equation $x^3 - 2x - 5 = 0$. 6M

b) Compute $y(7)$ and $y(9)$ Using Newton's forward formula from the following table: 6M

x	8	10	12	14	16	18
y	10	19	32.5	54	89.5	154

UNIT-III

5 a) Using Runge-Kutta method of fourth order, find $y(0.2)$ *and* $y(0.4)$ given that $\frac{dy}{dx} = y + e^{x}, y(0) = 0.$ 6M

b) Evaluate $\int_0^1 \frac{dx}{1+x^2}$, $n=10$ by using Trapezoidal rule. 6M

OR

6 a) Compute the value of $\int_{0.2}^{1.4} \left(\sin x - \log x + e^x\right)dx$ using Simpson's $\frac{3}{8}$ th rule. By Taking $n=6$. 6M

b) Obtain Picard's second approximate solution of the initial value problem $\frac{dy}{dx} = \frac{x^2}{y^2+1}$, $y(0)=0$. 6M

UNIT-IV

7 a) Find $L\left\{\frac{\sin 3t.\cos t}{t}\right\}$ and $L\left\{t^2 \sin 2t\right\}$. 6M

b) Find $L^{-1}\left\{\frac{s^2}{(s^2+4)(s^2+9)}\right\}$ Using Convolution theorem. 6M

OR

8 a) (i) Find the Laplace Transform of $\left\{\left(\sqrt{t}+\frac{1}{\sqrt{t}}\right)^3\right\}$. 6M

(ii) Find $L^{-1}\left\{\frac{2s^2-6s+5}{s^3-6s^2+11s-6}\right\}$.

b) Solve the differential equation $y''' + 2y'' - y' - 2y = 0$ given $y(0) = y'(0) = 0$ and $y''(0) = 6$ Use Laplace transform. 6M

UNIT-V

9 a) Find (i) $Z\left\{\cos\left(\frac{n\pi}{2}+\frac{\pi}{4}\right)\right\}$ 6M

(ii) $Z^{-1}\left\{\frac{z^2}{(z-1)(z-3)}\right\}$, by use convolution theorem.

b) Solve the difference equation $y_{n+2} + 6y_{n+1} + 9y_n = 2^n$ *with* $y_0 = 0, y_1 = 0$ by using transform. 6M

OR

10 a) Find $Z\left\{\frac{1}{n!}\right\}$ and hence Find i). $Z\left\{\frac{1}{(n+1)!}\right\}$, ii). $Z\left\{\frac{1}{(n+2)!}\right\}$ 6M

b) State and prove Initial and final value theorems for Z-transforms. 6M

Q.P. Code: 19HS0834 R19

Reg. No: | | | | | | | | | | |

B.Tech II Year I Semester Regular Examinations Feb / Mar 2021

NUMERICAL METHODS & TRANSFORMS

(ECE)

Time: 3 Hours Max. Marks: 60

Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

1 a) Find a real root of the equation $x \log_{10}^{x} = 1.2$ by regula-falsi method correct to four decimal places. 6M

b) Find by Newton's method , the real root of the equation 3x=cosx+1. 6M

OR

2 State Newton's interpolation formula (forward & backward). Using them find the first and tenth terms of the series for the data given below: 12M

x:	3	4	5	6	7	8	9
y:	4.8	8.4	14.5	23.6	36.2	52.8	73.9

UNIT-II

3 a) Using modified Euler's method, find $y(0.2)$ and $y(0.4)$ given $y'=y+e^x$, $y(0)=0$. 8M

b) Evaluate $\int_0^{12} \frac{dx}{1+x^2}$ by using Trapezoidal rule. 4M

OR

4 Using Runge-Kutta method of fourth order , solve for y at x=1.2 , 1.4, and 1.6 from $\frac{dy}{dx} = \frac{2xy + e^x}{x^2 + xe^x}, x_0 = 1, y_0 = 0.$ 12M

UNIT-III

5 a) Find the Laplace transform of (i) $f(t) = e^{-2t} + \sin 3t - \cosh 5t - t^2 + 3e^t \cos 5t$

(ii) $f(t) = \frac{\cos at - \cos bt}{t}$. 6M

b) Using convolution theorem find the inverse transform of $\frac{s}{\left(s^2 + a^2\right)^2}$. 6M

OR

6 If $L\{f(t)\} = \overline{f(s)}$, then prove that $L\left\{\int_0^t f(u)du\right\} = \frac{1}{s}\overline{f(s)}$ and hence, 6M

a) evaluate $L\left\{\int_0^t \left[\int_0^t \left(\int_0^t t \sin t \, dt\right) dt\right] dt\right\}$.

b) Use transform method to solve 6M

$x''(t) - 2x'(t) + x(t) = e^t$ with $x = 2, x' = -1$ at $t = 0$.

UNIT-IV

7 a) Find the Fourier series expansion of $f(x)=|\cos x| in -\pi \le x \le \pi$ 5M

b) Obtain Fourier series for the function $f(x)=\begin{cases} \pi x, 0 \le x \le 1 \\ \pi(2-x), 1 \le x \le 2 \end{cases}$. 7M

Deduce that $\frac{1}{1^2}+\frac{1}{3^2}+\frac{1}{5^2}+------=\frac{\pi^2}{8}$.

OR

8 a) Expand $f(x)=e^{-x} in -l \le x \le l$ 5M

b) Obtain the Fourier series expansion of $xsinx$ as a cosine series in $(0,\pi)$. Hence show that $\frac{1}{1.3}-\frac{1}{3.5}+\frac{1}{5.7}-.....=\frac{\pi-2}{4}$. 7M

UNIT-V

9 a) Find the Fourier transform of $f(x)=\begin{cases} 1-x^2, |x| \le 1 \\ 0 \quad , |x|>1 \end{cases}$. Hence evaluate $\int_0^\infty \frac{x\cos x-\sin x}{x^3}\cos\frac{x}{2}dx$. 8M

b) Find the Fourier cosine transform of $\left(1-\frac{x}{\pi}\right)^2$. 4M

OR

10 a) Find the Fourier cosine transform of $f(x)=\frac{1}{1+x^2}$. Hence derive the Fourier sine transform of $\phi(x)=\frac{x}{1+x^2}$. 8M

b) If $F_s(s)$ and $F_c(s)$ are Fourier sine and cosine transforms of f(x) resepctively, then prove that $F_s\{f(x)\cos ax\}=\frac{1}{2}[F_s(s+a)+F_s(s-a)]$. 4M

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Q.P. Code: **19ME0345**

R19

Reg. No: | | | | | | | | | | |

B.Tech II Year I Semester Regular Examinations Feb / Mar 2021

BASIC ELECTRICAL AND MECHANICAL ENGINEERING

(CIVIL ENGINEERING)

Time: 3 Hours | Max. Marks: 60

PART-A

Answer one question from each unit **(3 x 10 = 30 Marks)**

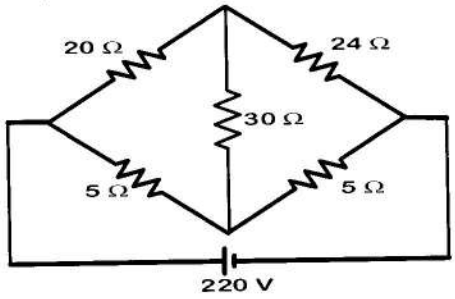
UNIT-I

1 a) State and explain Ohm's law. 5M

b) Explain in detail about passive elements. 5M

OR

2 Find the current delivered by the source for the circuit shown in figure. 10M



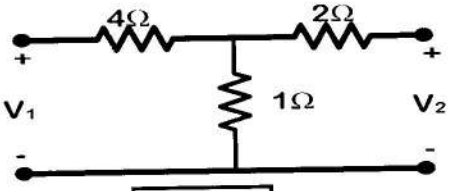
UNIT-II

3 a) State Thevenin's theorem 5M

b) Find the Thevenin's equivalent circuit across AB for the circuit shown. 5M

OR

4 Find the Short circuit parameters for the given circuit. 10M



UNIT-III

5 a) Derive Torque equation of dc motor. 5M

b) The counter emf of Shunt motor is 227 V. The field resistance is 160Ω and field current 1.5A. If the line current is 36.5A, find the armature resistance also find armature current when the motor is stationary. 5M

OR

6 a) Derive the condition for maximum efficiency of the transformer. 5M

b) Discuss about the voltage regulation of the transformer. 5M

PART-B

Answer one question from each unit (**3 x 10 = 30 Marks**)

UNIT-IV

1	a)	Sketch and explain different types of patterns are used in foundry.	5M
	b)	What are the different pattern allowances? Explain with neat sketch.	5M
		OR	
2		Classify the welding types? Explain the working of arc welding with neat sketch and mention the advantages, limitations and applications.	10M

UNIT-V

3	a)	Name the different types of the lathes?	5M
	b)	Write the different types of lathe operations?	5M
		OR	
4	a)	What is planer? Explain any one type of planer mechanism.	5M
	b)	Explain about (a) CNC machine (b) Programming	5M

UNIT-VI

5		What is Automobile? Draw the layout of automobileanddiscuss the functions of the automobile basic components.	10M
		OR	
6		What is meant by Vapour compression Refrigeration System? Explain its working with neat diagram	10M

R19

Code: 19EE0240

Reg. No: | | | | | | | | | | |

B.Tech II Year I Semester Regular Examinations Feb / Mar 2021

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

(Mechanical)

Time: 3 Hours Max. Marks: 60

PART-A

(Answer all Three units, 3 x 10 =30 Marks)

UNIT - I

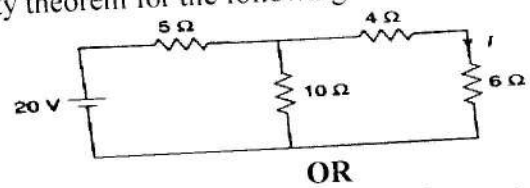
1. Derive the expressions of equivalent resistances of star network for the equivalent Delta network. 10M

OR

2. (a) Define the following. i. Electric Field. ii. Potential Difference. iii. Electric Current 5M
   (b) Two resistors of 4Ω and 6Ω are connected in parallel. If the total current is 30A, Find current flowing through each resistor and also find power consumed by each resistor. 5M

UNIT - II

3. Verify reciprocity theorem for the following circuit. 10M



OR

4. Derive the relation between Z-Parameters and Y- Parameters of a two port network. 10M

UNIT - III

5. Derive the expression of torque equation of a DC motor 10M

OR

6. Explain the construction & operation of single phase transformer. 10M

PART- B

(Answer all Three units, 3 x 10 =30 Marks)

UNIT - I

1. Explain the construction and V-I characteristics of Zener Diode. 10M

OR

2. (a) What is rectifier? Explain the role of filters in rectifiers. 5M
   (b) Draw the circuit diagram of a single- phase bridge rectifier with capacitor filter. Explain its operation with wave forms. 5M

UNIT - II

3. Explain the construction and operation of a Bi polar Junction Transistor. 10M

OR

4. What is the purpose of biasing of a transistor? Indicate the methods of biasing and compare them. 10M

UNIT - III

5. Explain the construction and operation of a Junction Field Effect Transistor 10M

OR

6. (a) Distinguish between BJT and JFET 5M
   (b) List out the applications of JFET. 5M

R19

Q.P. Code: 19EC0421

Reg. No: | | | | | | | | | | |

B.Tech II Year I Semester Regular Examinations Feb / Mar 2021

Microprocessors & Microcontrollers

(CSE)

Time: 3 Hours Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1	a)	Differentiate Microprocessor and Microcontroller. Mention applications		6M
	b)	Draw and explain architecture of 8085		6M
		OR		
2	a)	Explain the pin diagram of 8085 in detail.		6M
	b)	Differences between I/O mapped I/O and Memory mapped I/O		6M

UNIT-II

3	a)	Draw and explain the timing diagram of memory write cycle with example.		6M
	b)	Explain the direct addressing modes and indirect addressing modes of 8085 with example		6M
		OR		
4	a)	An 8085 microprocessor executes the following instructions as MVI A, 89 H MVI B, 74 H ORI 40 H SUB B Evaluate the contents of the accumulator and B register after execution.		6M
	b)	Discuss about the flag register of 8085 microprocessor.		6M

UNIT-III

5	a)	Discuss in detail about parallel I/O ports in 8051 microcontrollers		6M
	b)	Name the interrupt sources of 8051 for which the priority levels are highest and lowest, respectively.		6M
		OR		
6	a)	Discuss the internal memory organization of 8051 microcontroller		6M
	b)	An array of 10 numbers is stored in the internal data RAM of 8051 starting from location 30H. Write a program to move the array starting from location 40H.		6M

UNIT-IV

7	a)	Discuss the addressing modes of 8051. (i) Direct addressing mode. (ii) Register indirect addressing mode. (iii) Index addressing mode. (iv) Register addressing mode		6M
	b)	Explain different logical instructions of 8051 microcontroller with examples		6M
		OR		
8	a)	Explain different arithmetic instructions of 8051 microcontroller with examples		6M
	b)	Explain the format and bit definition of the following SFRs in 8051. (i) TMOD (ii) SCON (iii) IP		6M

UNIT-V

9	a)	Explain the steps taken to interface a seven-segment display with 8051 microcontrollers		6M
	b)	Explain the interfacing of LEDs to 8051 microcontroller.		6M
		OR		
10	a)	Elaborate the need of a dedicated keyboard display controller.		6M
	b)	With a neat schematic, explain the interfacing of A to D converters with 8051 microcontroller.		6M

Q.P. Code: 19CE0103 R19

Reg. No:

B.Tech II Year I Semester Regular Examinations Feb / Mar 2021

STRENGTH OF MATERIALS-II

(Civil Engineering)

Time: 3 Hours Max. Marks: 60

Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

1 a) A cylindrical thin drum 80 cm in diameter and 3 m long has a shell thickness of 1 cm. If the drum is subjected to an internal pressure of 2.5 N/mm2 , Take E= 2x 105 N/mm2 Poisson's ratio 0.25 Determine (i) change in diameter (ii) change in length and (iii) change in volume. 6M

b) A compound cylinder is made by shrinking a cylinder of external diameter 300 mm and internal diameter of 250 mm over another cylinder of external diameter 250 mm and internal diameter 200 mm. The radial pressure at the junction after shrinking is 8 N/mm2 . Find the final stresses set up across the section, when the compound cylinder is subjected to an internal fluid pressure of 84.5 N/mm2 6M

OR

2 a) A water main 80 cm diameter contains water at a pressure head of 100 m. If the weight density of water is 9810 N/m3 , find the thickness of the metal required for the water main. Given the permissible stress as 20 N/mm2 . 6M

b) A hollow cylindrical drum 600 mm in diameter and 3 m long, has a shell thickness of 10 mm. If the drum is subjected to an internal air pressure of 3 N/mm2 , determine the increase in its volume. Take E = 2 x 105 N/mm2 and Poisson's ratio = 0.3 for the material. 6M

UNIT-II

3 a) Explain maximum shear stress theory. b) Explain maximum shear strain energy theory 6M

b) Explain maximum shear strain energy theory 6M

OR

4 a) Explain maximum strain energy theory 6M

b) Explain maximum principal strain theory. 6M

UNIT-III

5 a) State the difference between twisting moment and bending moment 6M

b) Define Polar modulus, Torsional rigidity 6M

OR

6 a) The ratio of inside to outside diameter of a hollow shaft is 0.6. If there is a solid shaft with same torsional strength, what is the ratio of the outside diameter of hollow shaft to the diameter of the equivalent solid shaft 6M

b) Determine the torsional stiffness of a hollow shaft of length L and having outside diameter equal to 1.5 times inside diameter d. The shear modulus of the material is G 6M

UNIT-IV

7 a) State advantages of fixed ends or fixed supports . 6M

b) A fixed beam AB of length 3 m is having moment of inertia I = 3 x 106 mm4 . The support B sinks down by 3 mm. If E = 2 x 108 N/mm2 , find the fixing moments. 6M

OR

8 a) A continuous beam ABC of constant moment of Inertia carries a load of 10 kN in mid span AB and a central clockwise moment of 30 kN-min span BC. Span AB = 10 m and span BC = 15 m. Find the support moments and plot the shear froce and bending moment diagram 6M

b) .A fixed beam AB of length 3 m carries a point load of 45 kN at a distance of 2 in from A. If the flexural rigidity (i.e., EI) of the beam is 1 x 104 kNm2 , determine : (i) Fixed end moments at A and B, (ii) Deflection under the load, (iii) Maximum deflection, and (iv) Position of maximum deflection. 6M

UNIT-V

9 a) State the differences between straight beam and curved beam with examples. 6M

b) Analyse the quarter circle beam fixed at one end and free at other carrying a l 'p' at the free end. 6M

OR

10 a) Explain the importance of curved beams in structures.. 6M

b) Explain the importance of simply supported on three supports equally spaced. 6M

Code: 19CE0150

R19

Reg. No: | | | | | | | | | | |

II B.Tech. I Semester (R19) Regular Examinations, Feb/March 2021

Strength of Materials

(Mechanical Engg.)

Time: 3 Hours

Max. Marks: 60

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Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

1. A bar 4 m long and 100mm x 200mm in section is subjected to a pull of 60kN. If young's modulus of the material of the bar is 200kN/mm², find (i) Stress set up in the bar material (ii) Strain produced
(iii) Elongation of the bar and (iv) Work done.

OR

2. Two of the principal stresses at a point are 150 N/mm² and 100 N/mm². Determine the safe range of the third principal stress at the point by five different theories. Take E=2 x 10^5 N/mm², failure stress in tension test to be 210 N/mm², and μ=0.25. Failure stress in tension and compression is the same.

UNIT-II

3. A cantilever 2.5 m long carries a uniformly distributed load of 65kN per metre run at a length of 1.8m from the free end. Draw the shear force and bending moment diagrams for the beam.

OR

4. A simply supported beam 8 m long carrying a uniformly distributed load of 4 kN/m over a length of 5m from the left support. Draw shear force and bending moment diagrams. Determine the position and value of maximum bending moment.

UNIT-III

5. A T - section has the following dimensions: flange - 200mm x 50mm, web - 200mm x 50mm. The section is subjected to a vertical shear force of 270kN.
Calculate: (i) shear stress at the junction of the flange and web
(ii) shear stress at the Neutral axis.

OR

6. A close coiled helical spring is to have a stiffness of 10 N/cm of compression under a maximum load of 50 N and a maximum shearing stress of 12600 N/cm². The solid length of the spring is 4.5 cm. Find the diameter of the wire, the mean diameter of the coils and the number of coils required. Take
G= 4.2 x 10^6 N/cm².

UNIT-IV

7. A simply supported beam of span 3m and cross-sectional area 100mm x 300mm carries a point load of 25kN at a distance of 1m from the left end. Find the slope at its two ends and deflection under the point load. Take E= 2 x 10^4 N/mm².

OR

8. The section of a column is a rectangle 20cm x 10cm. The column carries an axial compressive load of 30kN. Factor of safety is 3 and E= 2.2 x 10^4 kN/cm². Determine the length of the column whose one end is fixed and the other end is free.

UNIT-V

9. The pressure of steam inside a boiler is 2 N/mm² and the thickness of the boiler plate is 10mm. the allowable tensile stress in the plate material is 85 N/mm². Efficiencies of the longitudinal and circumferential joints are 70% and 60% respectively. Determine the diameter of the boiler shell.

OR

10. In a thick walled cylindrical shell, the radial pressure is 25MPa at a radius of 400mm and 5 MPa when the radius is 600mm. If the internal radius of the cylinder is 200mm, determine the maximum radial pressure and maximum hoop stress.

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Q.P. Code: 19EE0202 R19

Reg. No:

B.Tech II Year I Semester Regular Examinations Feb / Mar 2021

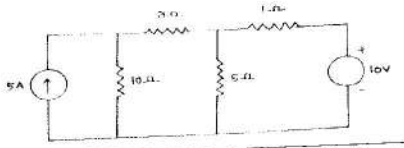
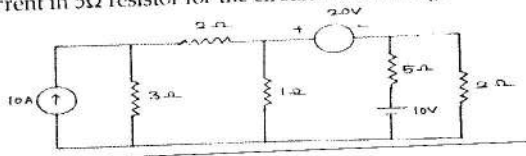
19EE0202-ELECTRICAL CIRCUITS -II

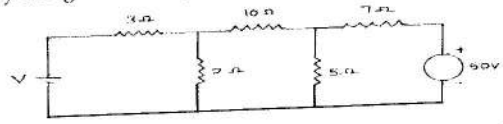
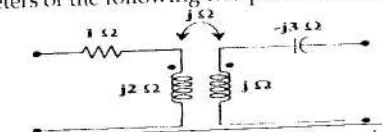
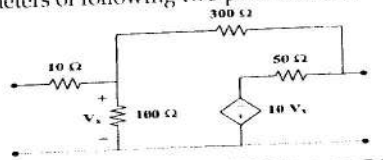
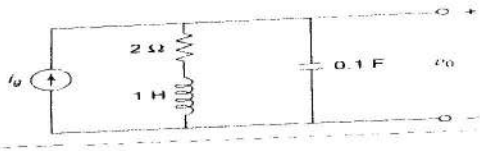
(Electrical and Electronics Engineering)

Time: 3 Hours Max. Marks: 60

Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

1	a)	Derive the relationship between Phase and Line voltages, currents in delta connected load.	6M
	b)	A 400V,3¢ supply feeds an unbalanced 3 wire star connected load. The branch impedances of the load are $Z_R=(4+j8)\Omega$,$Z_Y=(3+j4)\Omega$,$Z_B=(5+j20)\Omega$. Find the line currents and voltages across phase impedance. Assume RYB phase sequence.	6M
		OR	
2	a)	A balanced delta connected load of (4+j3) Ω per phase is connected to a balanced 3¢ 440v supply. Find a) active power b) reactive power c) Apparent power.	6M
	b)	A balanced star connected load of (4+j3) Ω per phase is connected to a balanced 3¢ 400v supply. Find a) active power b) reactive power c) Apparent power.	6M
		UNIT-II	
3	a)	Derive the transient response of an RL circuit with DC excitation.	6M
	b)	Derive the transient response of an RL circuit with AC excitation.	6M
		OR	
4	a)	A series RL circuit with R=30Ω and L=15H has a constant voltage V=60V applied at t=0. Determine the current I, the voltage across the resistor and across the inductor.	6M
	b)	Derive the transient response of an RLC circuit with AC excitation.	6M
		UNIT-III	
5	a)	Determine current in 10Ω resistor for the following network by using nodal analysis. 	6M
	b)	Determine current in 3Ω resistor for the circuit shown in figure. 	6M
		OR	
6	a)	Find voltage V for the circuit shown in fig which makes the current in the 10Ω	6M

		resistor is zero by using nodal analysis. 	
	b)	(i) Define duality. (ii) Define cutest. (iii) Define tieset.	6M
		UNIT-IV	
7	a)	Obtain the T parameters of the following two port network. 	6M
	b)	Find the Y - parameters for the resistance network shown in figure. 	6M
		OR	
8	a)	Obtain h and g parameters of following two port network. 	6M
	b)	Derive the expressions for Z-parameters in terms of ABCD parameters.	6M
		UNIT-V	
9	a)	Define Laplace transform of a function.	6M
	b)	Find the inverse Laplace transform of $F(S) = \frac{1}{(S+2)^2}$	6M
		OR	
10	a)	A 1kΩ resistor is in series with a 500mH inductor. This series combination is in parallel with a 0.4μF capacitor. Express the equivalent s-domain impedance of these parallel branches as a rational functional.	6M
	b)	Derive the numerical expression for the transfer function v_o/I_g for the circuit shown. 	6M

Q.P. Code: 19EE0242 R19

Reg. No:

B. Tech II Year I Semester Regular Examinations Feb / Mar 2021

19EE0242 Network Theory

(ECE)

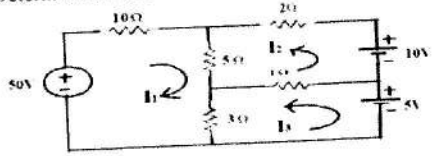
Time: 3 Hours Max. Marks: 60

Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

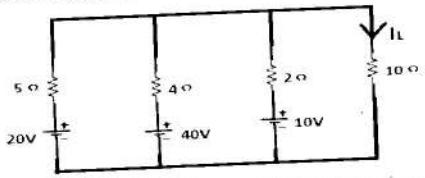
1 a) Explain about Nodal analysis and write the steps for applying nodal analysis 6M

b) Determine the mesh currents for the following network 6M

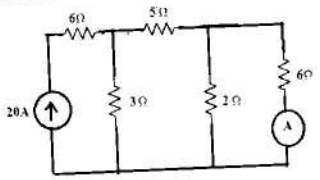


OR

2 a) Find the current I_L, use millman's theorem as shown in figure below 6M



b) Determine the ammeter reading where it is connected to 6Ω resistor as shown in below figure. The internal resistance of the ammeter is 2Ω., by using compensation theorem 6M



UNIT-II

3 a) A series RLC circuit has R=10Ω, L=0.1H and C=50μF. The applied voltage is 100V. Fin Resonant frequency & Quality factor of a coil 6M

b) Explain about Series resonance with phasor diagrams. 6M

OR

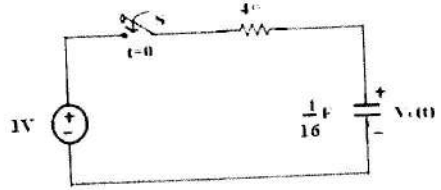
4 a) Design a High –pass filter having a cut-off frequency of 1kHz with a load resistance of 600Ω 6M

b) Design a Band-elimination filter having design impedance of 600Ω and cut-off frequencies f_1= 2kHz and f_2= 6 kHz 6M

UNIT-III

5 a) Derive the Transient Response of series RL-circuit with D.C excitation. 6M

b) Determine The Current I for T>0 If $V_c(0)$ = 9V For The Circuit Shown In Fig 6M



OR

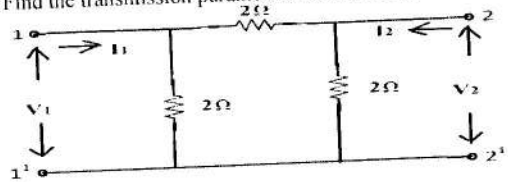
6 a) Derive the Laplace Transform of Series RC Circuit 6M

b) A series RL circuit with R=30Ω and L= 15H has a constant voltage V=60v applied at t=0. Determine the current "I", voltage across resistor and voltage across inductor. 6M

UNIT-IV

7 a) Explain about Impedance parameters. 6M

b) Find the transmission parameters for the circuit shown in figure 6M



OR

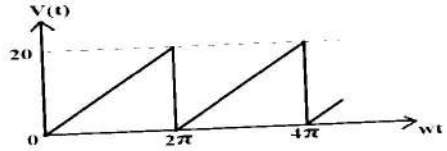
8 a) The given ABCD parameters are, A=2, B=0.9, C=1.2, D= 0.5. Find Y-parameters. 6M

b) The given Y-parameters are, Y_{11}= 0.5, Y_{12}= Y_{21}= 0.6, Y_{22}= 0.9.Find Z- parameters 6M

UNIT-V

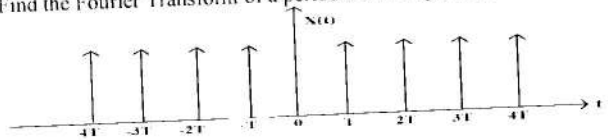
9 a) Derive the Trigonometric form of Fourier series 6M

b) Find the Fourier series for the following waveform 6M



OR

10 a) Find the Fourier Transform of a periodic unit impulse train shown in figure 6M



b) Explain about waveform symmetry for even and odd functions. 6M

R19

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B.Tech II Year I Semester Regular Examinations Feb / Mar 2021

COMPUTER ORGANIZATION AND ARCHITECTURE

(CSE)

Time: 3 Hours Max. Marks: 60

Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

1	a)	Narrate the Instruction Cycle with neat diagram?	6M
	b)	Write in detail about the Basic Operational Concepts with neat diagram ?	6M
		OR	
2		Discuss briefly about Program Control Instructions?	12M

UNIT-II

3		Draw the flowchart for Multiplication of positive numbers and steps with an example.	12M
		OR	
4		Describe the Floating point numbers, its operations and implementation	12M

UNIT-III

5		Define register transfer language? Explain in detail.	12M
		OR	
6	a)	Write about Bus transfer with neat diagram.	6M
	b)	Summarize the Register Representations and way it is used.	6M

UNIT-IV

7	a)	Explain briefly about Memory Hierarchy with neat sketch?	6M
	b)	Discuss briefly about synchronous DRAMs?	6M
		OR	
8		Describe the use of DMA controllers in a computer system with a neat block diagram.	12M

UNIT-V

9	a)	Draw and explain arithmetic pipeline for floating point multiplication.	6M
	b)	Illustrate the instruction pipeline with neat timing diagram.	6M
		OR	
10	a)	List out the conflicts in pipelining and explain about it	6M
	b)	Explain about 4-segment Instruction Pipeline with neat diagram	6M

R19

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B.Tech II Year I Semester Regular Examinations Feb / Mar 2021

BUILDING MATERIALS & CONSTRUCTION

(CIVIL ENGINEERING)

Time: 3 Hours Max. Marks: 60

Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

1	What are the methods of quarrying and precautions in quarrying of stones		12M
	OR		
2	Explain various types of seasoning of Timber.		12M

UNIT-II

3	a)	What are the Ingredients of cement	6M
	b)	Write about gypsum and rubber	6M
		OR	
4	Explain about workability of concrete and explain any two methods.		12M

UNIT-III

5	What are steps involved in process of painting a plastered surface		12M
		OR	
6	a)	What do you mean by soundness of aggregate?	6M
	b)	How do you differentiate between fine and coarse aggregates	6M

UNIT-IV

7	Remedial measures of foundation failures.		12M
	OR		
8	What is masonry & what are the types of stone masonry.		12M

UNIT-V

9	What are the methods of plastering explain briefly.		12M
	OR		
10	Explain classification of stairs with examples.		12M

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B.Tech II Year I Semester Regular Examinations Feb / Mar 2021

KINEMATICS OF MACHINERY

(MECH)

Time: 3 Hours Max. Marks: 60

Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

1	a)	What is pantograph? Show that it generates a path similar to the path traced by a point on the mechanism.	6M	
	b)	What is constrained motion and what are the different types of constrained motions? Give one example for each with suitable sketch.	6M	
		OR		
2	a)	Explain the working of beam engine with neat sketch	6M	
	b)	Explain the working of Oscillating cylinder engine with neat sketch	6M	

UNIT-II

3	a)	What is the condition for correct steering? Write fundamental equation of it.	6M	
	b)	Give a neat sketch of the straight line motion Hart mechanism.	6M	
		OR		
4	a)	Sketch and Describe the watt mechanism.	6M	
	b)	Sketch and Describe the Tchebichef mechanism.	6M	

UNIT-III

5	a)	What are the various methods used for finding out acceleration of mechanism? Explain one of them.	6M	
	b)	How the Velocity of a Point on a Link can find by Relative velocity method.	6M	
		OR		
6	a)	Discuss the three types of instantaneous centers for a mechanism	6M	
	b)	Write the relation between the number of instantaneous centers and the number of links in a mechanism.	6M	

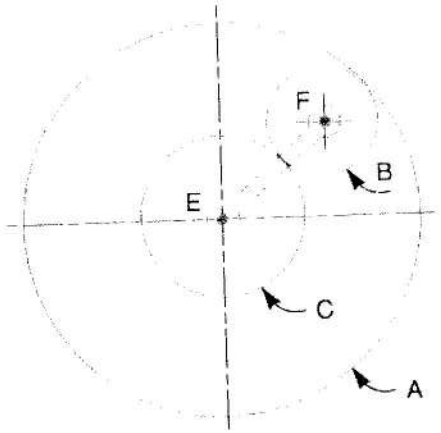
UNIT-IV

7	a)	Explain with sketches the different types of followers.	6M	
	b)	Write short notes on cams .	6M	
		OR		
8		A cam rotating clockwise at a uniform speed of 1000 r.p.m. is required to give a roller follower the motion defined below : 1. Follower to move outwards through 50 mm during 120° of cam rotation, 2. Follower to dwell for next 60° of cam rotation, 3. Follower to return to its starting position during next 90° of cam rotation, 4. Follower to dwell for the rest of the cam rotation. The minimum radius of the cam is 50 mm and the diameter of roller is 10 mm. The line of stroke of the follower is off-set by 20 mm from the axis of the cam shaft. If the displacement of the follower takes place with uniform and equal	12M	

acceleration and retardation on both the outward and return strokes, draw profile of the cam and find the maximum velocity and acceleration during out stroke and return stroke.

UNIT-V

9	a)	Explain the terms :(i) Module, (ii) Pressure angle, and (iii) Addendum.	6M	
	b)	State and prove the law of gearing. Show that involute profile satisfies the condit for correct gearing.	6M	
		OR		
10		An epicyclic gear consists of three gears A, B and C as shown in Fig. 13.10.The gear A has 72 internal teeth and gear C has 32 external teeth. The gear B meshes with both A and C and is carried on an arm EF which rotates about the center of A at 18 r.p.m.. If the gear A is fixed, determine the speed of gears B and C.	12M	



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B.Tech II Year I Semester Regular Examinations Feb / Mar 2021

Electrical Machines - I

(EEE)

Time: 3 Hours Max. Marks: 60

Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

1		Explain the effects of armature reaction in a DC Generator Briefly	12M
		OR	
2	a)	What are the causes for the failure of self-excitation?	6M
	b)	Distinguish between Lap and Wave windings?	6M

UNIT-II

3		A 25HP, 250V DC Series motor has armature resistance 0.1Ω and field resistance 0.05Ω and brush contact drop 3V. When the line current is 80A, the speed is 600rpm. Find the speed when the line current is 100A.	12M
		OR	
4		Explain the operation of four point starter for a DC motor with neat diagram?	12M

UNIT-III

5		Describe Hopkinson test in detail. What are its advantages and disadvantages?	12M
		OR	
6		A Shunt generator delivers 195A at terminal Voltage of 250V. The armature resistance and shunt Field resistances are 0.02 Ω and 50 Ω respectively. The iron and friction losses equal 950W. Find (a) EMF generated (b) Copper losses (c) output of the prime mover (d) commercial, mechanical and electrical Efficiencies	12M

UNIT-IV

7	a)	Draw the Expression for Voltage regulation of a transformer form the simplified approximate equivalent circuits of 1-Φ transformer and also obtain condition for zero regulation.	6M
	b)	A 10KVA, 2000/400V single phase transformer has the following data: R1=5Ω, X1=12Ω, R2=0.2 Ω, X2=0.48 Ω. Determine the secondary terminal voltage at full load, 0.8 power factor lagging when the primary supply voltage is 2000V.	6M
		OR	
8	a)	What is an ideal transformer? Also explain the operation of an ideal single phase transformer under no load condition	6M
	b)	An ideal 25KVA transformer has 500 turns on the primary winding and 40 turns on the secondary winding. The primary is connected to 3000V, 50HZ supply. Calculate (i) primary and secondary currents at full load (ii) secondary emf and (iii) the maximum core flux.	6M

UNIT-V

9		State and explain the various conditions of parallel operation of three-phase transformers.	12M
		OR	
10	a)	Draw the Connection diagram of open delta connected three-phase transformer.	6M
	b)	Compare a Three –phase transformer with single phase transformer in detail	6M

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B.Tech II Year I Semester Regular Examinations Feb / Mar 2021

SIGNALS, SYSTEMS & RANDOMPROCESS

(ECE)

Time: 3 Hours Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1 a) Find the even and odd components of the signal $x(t) = \cos(w_0 t + \pi/3)$ 6M

b) Determine whether the systems described the i/p o/p equations are linear, timeinvariant, dynamic and stable 6M

i) $y_1(t) = x(t-3) + (3-t)$

ii) $y_2(t) = dx(t)/dt$

iii) $y_3(n) = n\,x(n) + b\,x^2(n)$

OR

2 a) Explain the concepts of unit step function and Signum function. 6M

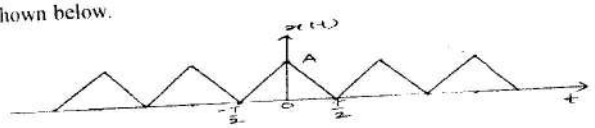
b) A system represented by $y(t) = 2x(t-2) + 2x(t+2)$. 6M

i) Is the system time invariant? Justify your answer.

ii) Is the system causal? Justify your answer.

UNIT-II

3 a) Determine the exponential form of the Fourier series representation of the signal shown below. 6M

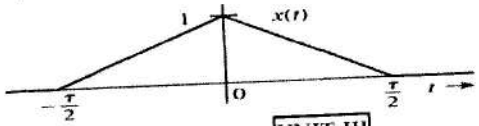


b) Find the Fourier Transform of the signal $x(t) = e^{at}\,u(-2t)$ 6M

OR

4 a) Bring out the relationship between Trigonometric and Exponential Fourier series 6M

b) Compute the Fourier transform of the signal x(t) applying differentiation in time property of Fourier transform. 6M



UNIT-III

5 a) Explain how input and output signals are related to impulse response of a LTI system 6M

b) Derive the time domain condition for stability of LTI system. 6M

OR

6 a) Consider a stable LTI system characterized by the differential equation: $dy(t)/dt + 2y(t) = x(t)$. Find its ipulse response. 6M

b) State and prove time convolution theorem. 6M

UNIT-IV

7 a) Briefly explain the Constraints on ROC for various classes of signals 6M

b) State and prove Baye's Theorem 6M

OR

8 a) State and prove initial value and final value theorems of Laplace transform 6M

b) State and prove any four properties of Probability Density Function. 6M

UNIT-V

9 a) A random process is defined as $X(t) = A\,\cos(\omega_0 t + \Theta)$, where Θ is a uniformly distributed random variable in the interval $(0, \pi/2)$. Check for its wide sense stationarity? A and ω_0 are constants 6M

b) Find auto correlation function of a random process whose power spectral density is given by $4/(1+(\omega^2/4))$ 6M

OR

10 a) What is ACF? State and explain any four properties of ACF? 6M

b) Prove the following 6M

i) $|R_{XX}(\tau)| \le R_{XX}(0)$ ii) $R_{XX}(-\tau) = R_{XX}(\tau)$ iii) $R_{XX}(0) = E[X^2(t)]$

R19

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BTECH II Year I Semester Regular Examinations Feb/Mar 2021
DATABASE MANAGEMENT SYSTEMS
(CSE)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	(a)	Explain about Views of data.	6M
	(b)	Explain about Database languages with examples?	6M
		OR	
2		Construct ER Diagram for University(i.e. Banking system, Hospital management system, Railway Reservation system, Online Shopping)	12M

UNIT-II

3	(a)	Distinguish GROUP by and HAVING clauses with examples?	6M
	(b)	Give an examples of clauses SELECT with an example.	6M
		OR	
4	(a)	Discuss the candidate key, primary key, super key, composite key and alternate key.	6M
	(b)	Distinguish different types of aggregate operators with examples in SQL?	6M

UNIT-III

5		Discuss about 4NF/MVD with example.	12M
		OR	
6	(a)	What is Normalization? List out the purpose normalization.	12M
	(b)	Outline the terminologies: Partial Dependency, Transitive Dependency, Determinant, MVD, Join Dependency	

UNIT-IV

7		Explain Timestamp-Based Concurrency control protocol and the modifications implemented in it.	12M
		OR	
8	(a)	What are the states of transaction?	6M
	(b)	What are the two statements regarding transaction?	6M

UNIT-V

9	(a)	Illustrate classification of storage structure.	6M
	(b)	Explain in detail about ISAM.	6M
		OR	
10	(a)	Explain about failure with loss of non-volatile storage.	6M
	(b)	What are the methods that are used in log based recovery?	6M

*** END ***

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B.Tech II Year I Semester Regular Examinations Feb /Mar 2021

Relational Database Management Systems
(Common to CE, EEE & MECH)

Time: 3 Hours Max. Marks: 60

Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1	a)	Discuss about the purpose of Database Systems?	6M
	b)	Explain about Database users and Administrators.	6M

OR

2	a)	Draw the Architecture of Database.	6M
	b)	Define i) Database ii) DBMSiii) List the database Applications	6M

UNIT-II

3	a)	Explain about Relational calculus.	6M
	b)	Explain about conditional join with syntax and example.	6M

OR

4	a)	Write about relational algebra?	6M
	b)	Explain about ER diagram with example.	6M

UNIT-III

5	a)	Explain Union with example.	6M
	b)	Explain about aggregate operators with an example.	6M

OR

6	a)	Discuss about GROUP BY clauses and HAVING clauses.	6M
	b)	What is outer joins with an examples?	6M

UNIT-IV

7	a)	Write a short notes on Dependency preserving Decomposition	6M
	b)	Comparison between 1NF, 2NF, and 3NF.	6M

OR

8	a)	Explain about properties of decompositions?	6M
	b)	Illustrate redundancy and the problems that it can cause?	6M

UNIT-V

9	a)	Explain in detail about ISAM.	6M
	b)	Explain different types of locks.	6M

OR

10	a)	What is meant by buffer blocks?	6M
	b)	What are the factors to be taken into account when choosing a RAID level?	6M

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B.Tech II Year I Semester Regular Examinations Feb /Mar 2021

LINUX PROGRAMMING

(ECE)

Time: 3 Hours Max. Marks: 60

Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

1	a)	What are the file types available in Unix? Discuss file operators with suitable examples?	6M
	b)	Illustrates about standard streams?	6M

OR

2	a)	Distinguish between time – sharing and client/server environment.	6M
	b)	Explain the security levels provided in Unix environment. How to change permissions of a file?	6M

UNIT-II

3	a)	Explain command substitution with example.	6M
	b)	Explain about Command Execution?	6M

OR

4	a)	Distinguish between a user-defined variable and predefined variable?	6M
	b)	Define a Variable and distinguish between a variable and value ?	6M

UNIT-III

5	a)	How text manipulation is done in vi? Explain.	6M
	b)	Explain about comparing files with examples?	6M

OR

6	a)	How files with duplicate lines are handled in Unix.	6M
	b)	Write a shell program for counting characters, words and line?	6M

UNIT-IV

7	a)	Discuss about Korn Shell and its Features?	6M
	b)	Explain about file contents and its directories?	6M

OR

8		Describe the overview of Sed and awk ?	12M

UNIT-V

9		Detail about the variables associated with C shell.	12 M

OR

10		Explain the following: (i) special parameters (ii) command history	12 M