NSRIT

AUTONOMOUS

SEMESTER END EXAMINATION MODEL QUESTION PAPERS

Semester II
B. Tech.

ACADEMIC REGULATION 2020

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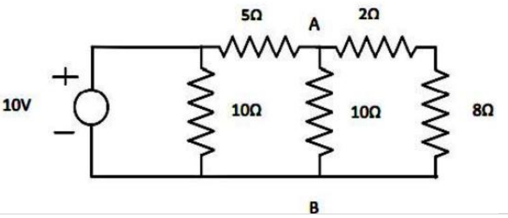
Semester End Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	CE/ME/CSE/CSM/CSD			**Academic Year**	2020 - 2021
Course Code	20ESX05	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	II
Course	**Basic Electrical and Electronics Engineering**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is meant by unilateral and bilateral circuit?	20ESX05.1	L1
2	List and give the applications of different types of DC machines	20ESX05.2	L2
3	Define regulation of alternator	20ESX05.3	L1
4	Define operation of a single phase transformer	20ESX05.4	L1
5	What is bridge rectifier?	20ESX05.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain about Kirchhoff's Current and Voltage Law	6M	20ESX05.1	L2
6 (b)	Derive star-delta and delta-star transformations	6M	20ESX05.1	L3
	OR			
7 (a)	Classify different types of network elements	6M	20ESX05.1	L2
7 (b)	In the circuit shown in figure , find the current through 8 Ω branch 	6M	20ESX05.1	L3
8	Explain principle of operation and construction of DC generator	12M	20ESX05.2	L2
	OR			
9 (a)	Explain the operation of 3 point starter	6M	20ESX05.2	L2
9 (b)	How do you conduct brake test on d.c shunt motor? How it is used to find out efficiency?	6M	20ESX05.2	L2
10	A 3-phase star connected alternator is rated at 100 kVA. On short-circuit a field current of 50 amp gives the full load current. The e.m.f. generated on open circuit with the same field current is 1575 V/phase. Calculate the voltage regulation at (a) 0.8 power factor lagging, and (b) 0.8 power factor leading by synchronous impedance method. Assume armature resistance is 1.5 Ω	12M	20ESX05.3	L3
	OR			
11 (a)	Explain principle of Operation of 3-Φ induction motor with neat sketches	6M	20ESX05.3	L3
11(b)	Explain Speed-Torque Characteristics of 3- Φ induction Motor with neat sketches	6M	20ESX05.3	L3
12	Explain the construction features of single phase transformer	12M	20ESX05.4	L2
	OR			
13	Conduct OC and SC test on a single phase transformer	12M	20ESX05.4	L2
14	Explain characteristics of operation amplifiers (OP-AMP) in brief	12M	20ESX05.5	L2

OR				
15(a)	What are the applications of OP-AMP?	6M	20ESX05.5	L2
15(b)	Explain operation and characteristics of zener diode	6M	20ESX05.5	L2

12 (a)	Write a C program to maintain a book structure containing name, author and pages as structure members. Pass the address of structure variable to a user defined function and display the contents	6M	20ESX02.4	L2
12 (b)	Define a structure called complex consisting of two floating point numbers x and y and declare a variable p of type complex. Assign initial values 0.0 and 1.1 to the members	6M	20ESX02.4	L2
	OR			
13	Compare the differences between structure and union. Explain usage of structure in terms of definition, declaration and accessing members with syntax and example	12M	20ESX02.4	L2
14	With syntax and example describe the following file handling functions a. fopen() b. fclose() c. fread() d. fwrite() e. fscanf() f. fprintf()	12M	20ESX02.5	L2
	OR			
15 (a)	Describe pre-processor directives	6M	20ESX02.5	L2
15 (b)	Write a program for adding two integers and display the sum by taking input through command line arguments	6M	20ESX02.5	L2

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Semester End Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	CE			**Academic Year**	2020 - 2021
Course Code	20CE201	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	II
Course	**BUILDING MATERIALS AND CONSTRUCTION COMPONENTS**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is meant by quarrying of stone?	20CE201.1	L1
2	Define seasoning of timber	20CE201.2	L1
3	What are the advantages of cavity walls?	20CE201.3	L1
4	Give any four reasons for dampness in a building	20CE201.4	L1
5	Classify aggregates based on shape	20CE201.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What are steps involved in manufacture of bricks and explain briefly	6M	20CE201.1	L2
6 (b)	Explain the composition of good brick earth? Mention in detail the functions of ingredients of brick earth including harmful ingredients	6M	20CE201.1	L2
	OR			
7 (a)	What are the characteristics of good tiles explain them briefly?	6M	20CE201.1	L2
7 (b)	Illustrate the Applications & uses of the materials like Aluminum and Bituminous& Steel	6M	20CE201.1	L2
8 (a)	Define Energy efficient building materials and what are the applications of Geosynthetics and recycled steel?	6M	20CE201.2	L1
8 (b)	Mention the different types defects in Timber	6M	20CE201.2	L1
	OR			
9 (a)	Describe the applications of (i) cavity wall (ii) partition wall	6M	20CE201.2	L1
9 (b)	Write about low carbon material like Blended cements and compacted fly ash bricks	6M	20CE201.2	L1
10 (a)	Explain the manufacturing process of lime	6M	20CE201.3	L2
10 (b)	Explain the manufacturing process of Cement	6M	20CE201.3	L2
	OR			
11 (a)	What are the ingredients of cement explain their functions	6M	20CE201.3	L2
11 (b)	Classify different types of cement. Explain any four types of cement with applications	6M	20CE201.3	L2
12 (a)	Explain in detail constituents of paints. Also classify different types of paints	6M	20CE201.4	L2
12 (b)	Explain in detail the construction of king post and queen post trusses with neat sketch	6M	20CE201.4	L2
	OR			
13 (a)	List out different Damp proofing materials. Also explain the use of all materials	6M	20CE201.4	L2

13 (b)	Classify different types of floors. Explain the construction process of any four types of floors with neat sketches	6M	20CE201.4	L2
14 (a)	Classify the aggregates based on the shape and surface texture. Also explain how these factors affect the performance of concrete	7M	20CE201.5	L2
14 (b)	Give the detailed classification of aggregates based on geological origin source size and shape texture	5M	20CE201.5	L2
	OR			
15 (a)	Define Fine Modulus of Aggregate? Explain the detailed test process to calculate the fine modulus of fine aggregate	6M	20CE201.5	L2
15 (b)	What is the importance of specific gravity aggregate? Mention the testing process to determine its character	6M	20CE201.5	L2

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Semester End Examination, October, 2021

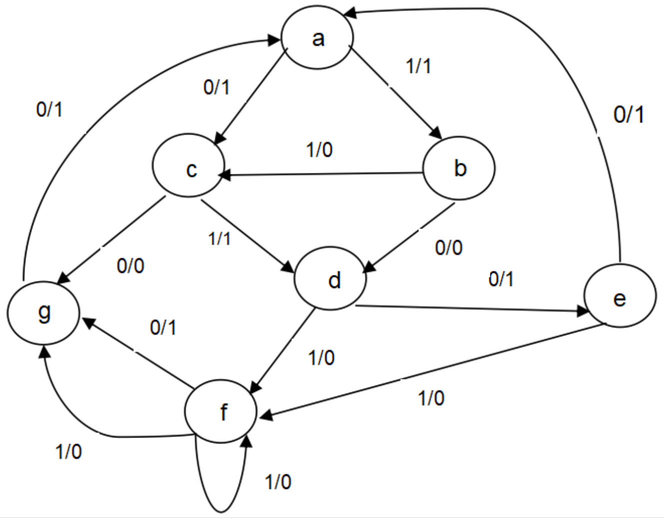
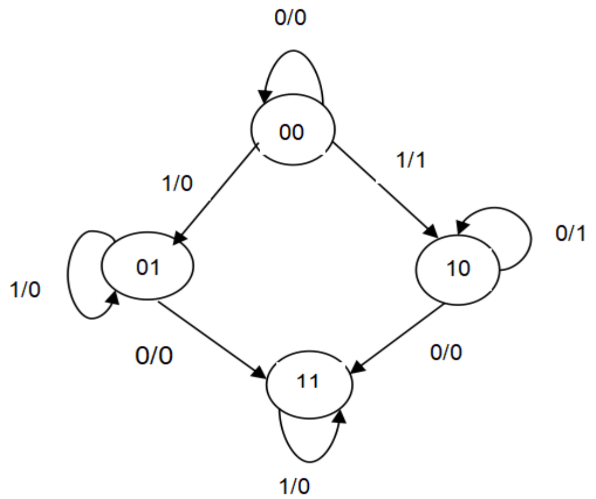
Degree	B. Tech. (U. G.)	**Program**	CSE,CSM & CSD			**Academic Year**	2020 - 2021
Course Code	**20EC203**	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	II
Course	**Digital logic Design**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Find the value of x for $(225)_x=(341)_8$.	20EC203.1	L1
2	State and prove Demorgan's theorems	20EC203.2	L1
3	Write the steps involved in the design of a combinational circuit	20EC203.3	L1
4	Write a short note on PROM	20EC203.4	L1
5	Write a note on asynchronous counter	20EC203.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Convert the following (i)$AB_{16}=(\ )_{10}$ (ii) $1234_8=(\ )_{10}$ (iii) $772_{10}=(\ )_{16}$	6M	20EC203.1	L2
6 (b)	Perform the given subtraction using 1's and 2's complement methods: $(10110)_2-(1101101)_2$	6M	20EC203.1	L2
	OR			
7 (a)	Use the 15's complement method of subtraction to compute $B02_{16}-98F_{16}$	6M	20EC203.1	L2
7 (b)	Convert the following binary 1011101 into gray code. Convert the following gray code 110011 into its equivalent binary	6M	20EC203.1	L2
8 (a)	Simplify the following expression (i)Y=(A+B)(A'+C)(B'+C') (ii)Y=XY+XYZ+XYZ'+X'YZ	6M	20EC203.2	L2
8 (b)	Solve the given expression using consensus theorem A'B'+AC+BC'+B'C+AB	6M	20EC203.2	L2
	OR			
9 (a)	Convert the given expression in canonical SOP form f(A,B,C)=AC+AB+BC	6M	20EC203.2	L2
9 (b)	Convert the given expression in canonical POS form f(A,B,C)=(A+B) (B+C) (A+C)	6M	20EC203.2	L2
10 (a)	Design the full adder using two half adders	6M	20EC203.3	L6
10 (b)	Design a 4-bit carry look ahead adder circuit	6M	20EC203.3	L6
	OR			
11 (a)	Design 1:8 Demultiplexer using two 1:4 Demultiplexers.	6M	20EC203.3	L6
11 (b)	Design and draw the circuit for 3- to-8 decoder and explain	6M	20EC203.3	L6
12 (a)	Show and implement the following function using a PROM $F(w,x,y,z)=\Sigma m(1,9,12,15)$ $G(w,x,y,z)=\Sigma m(0,1,2,3,4,5,7,8,10,11,12,13,14,15)$	6M	20EC203.4	L2
12 (b)	Explain the Conversion of SR flip-flop to T-flip-flop	6M	20EC203.4	L2

	OR			
13 (a)	Show and Implement the following circuit with a PLA having 3 inputs,3 product terms and two outputs F1= $\Sigma m(3,5,7)$ F2= $\Sigma m(4,5,7)$	6M	20EC203.4	L2
13 (b)	Explain about master-slave flip-flop in detail	6M	20EC203.4	L2
14 (a)	Explain Finite State Machine and its two types	6M	20EC203.5	L2
14 (b)	Define State Diagram and explain in terms of mealy and moore circuit with an example	6M	20EC203.5	L2
	OR			
15 (a)	Illustrate and obtain the reduced state table and reduce state diagram for the sequential whose sate diagram 	6M	20EC203.5	L2
15 (b)	Show the design of a clocked sequential circuit for the following state diagram 	6M	20EC203.5	L2

12 (a)	Write a C program to maintain a book structure containing name, author and pages as structure members. Pass the address of structure variable to a user defined function and display the contents	6M	20ESX02.4	L2
12 (b)	Define a structure called complex consisting of two floating point numbers x and y and declare a variable p of type complex. Assign initial values 0.0 and 1.1 to the members	6M	20ESX02.4	L2
	OR			
13	Compare the differences between structure and union. Explain usage of structure in terms of definition, declaration and accessing members with syntax and example	12M	20ESX02.4	L2
14	With syntax and example describe the following file handling functions a. fopen() b. fclose() c. fread() d. fwrite() e. fscanf() f. fprintf()	12M	20ESX02.5	L2
	OR			
15 (a)	Describe pre-processor directives	6M	20ESX02.5	L2
15 (b)	Write a program for adding two integers and display the sum by taking input through command line arguments	6M	20ESX02.5	L2

Semester End Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	CSE/CSM/CSD			**Academic Year**	2020 - 2021
Course Code	20CS201	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	II
Course	**Data Structures using 'C'**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Write any four applications of data structure	20CS201.1	L1
2	Sketch the diagram of circular queue	20CS201.2	L1
3	Show the memory representation of Stack using array with the help of a diagram	20CS201.3	L1
4	State the following terms: 1. Ancestor 2. Height of Degree	20CS201.4	L1
5	Describe given two types of graphs: Directed and undirected graph	20CS201.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Learning Outcome (s)	DoK
6 (a)	Explain Binary search algorithm with an example	20CS201.1	L2
6 (b)	Write the algorithm for quick sort with an example	20CS201.1	L3
	OR		
7 (a)	Explain algorithm for merge sort with an example	20CS201.1	L2
7 (b)	Write the selection sort algorithm and apply it to sort the following elements 10, 50, 4, 67, 6, 5, 1	20CS201.1	L3
8	Explain all possible insertion operations on single linked list with corresponding algorithm using 10, 20, 30, 40, 50. And sketch stepwise procedure from start to end	20CS201.2	L2
	OR		
9 (a)	Explain the algorithm to insert at front and delete at front operations on Doubly Linked List	20CS201.2	L2
9 (b)	Compare Singly Linked List with Doubly Linked List	20CS201.2	L2
10 (a)	Write an algorithm to convert infix to postfix expression	20CS201.3	L2
10 (b)	Explain push and pop operations of stack	20CS201.3	L2
	OR		
11 (a)	Write an algorithm to perform Queue insertion and deletion using arrays	20CS201.3	L2
11 (b)	Explain the implementation of Queue using linked list with necessary algorithm and diagram	20CS201.3	L2
12 (a)	Define the following a) root node b) leaf node c) level of tree d) child node e)parent node	20CS201.4	L1
12 (b)	Explain a binary tree for the following values and traverse the tree in preorder, inorder and postorder: 46, 76, 36, 26, 16, 56, 96	20CS201.4	L2
	OR		
13(a)	Write an algorithm for inserting and deleting a node in a binary search tree	20CS201.4	L1
13 (b)	Explain the properties of a binary search tree in detail	20CS201.4	L2
14 (a)	Explain Depth First Search algorithm in detail	20CS201.5	L2

14 (b)	Explain the Kruskal's algorithm to find the minimum cost spanning tree with an example	20CS201.5	L2
OR			
15 (a)	Explain the Prim's algorithm to find the minimum cost spanning tree with an example	20CS201.5	L2
15 (b)	Explain Breadth First Search algorithm in detail	20CS201.5	L2

12 (a)	Write a C program to maintain a book structure containing name, author and pages as structure members. Pass the address of structure variable to a user defined function and display the contents	6M	20ESX02.4	L2
12 (b)	Define a structure called complex consisting of two floating point numbers x and y and declare a variable p of type complex. Assign initial values 0.0 and 1.1 to the members	6M	20ESX02.4	L2
	OR			
13	Compare the differences between structure and union. Explain usage of structure in terms of definition, declaration and accessing members with syntax and example	12M	20ESX02.4	L2
14	With syntax and example describe the following file handling functions a. fopen() b. fclose() c. fread() d. fwrite() e. fscanf() f. fprintf()	12M	20ESX02.5	L2
	OR			
15 (a)	Describe pre-processor directives	6M	20ESX02.5	L2
15 (b)	Write a program for adding two integers and display the sum by taking input through command line arguments	6M	20ESX02.5	L2

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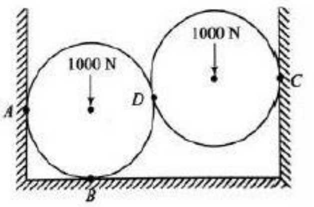
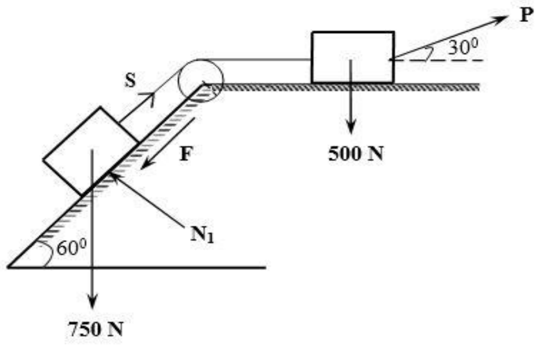
Semester End Examination, October, 2021

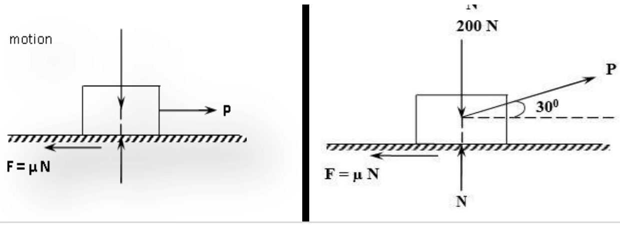
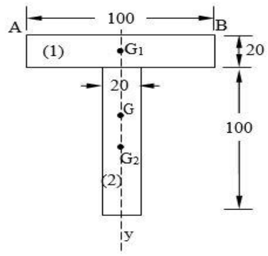
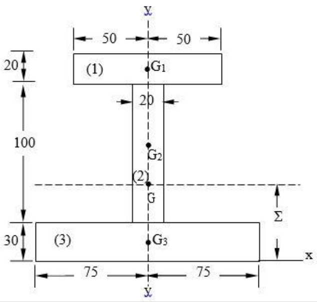
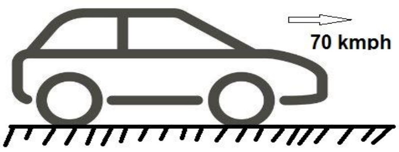
Degree	B. Tech. (U. G.)	**Program**	CE, EEE & ME			**Academic Year**	2020 - 2021
Course Code	20ESX04	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	II
Course	**ENGINEERING MECHANICS**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define Parallelogram Law	20ESX04.1	L1
2	Write any four advantages and limitations of friction	20ESX04.2	L1
3	Differentiate between centroid and center of gravity	20ESX04.3	L2
4	Define and mention units for velocity of projection	20ESX04.4	L1
5	Write work-energy equation	20ESX04.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Derive and Explain about Law of Triangular forces	6M	20ESX04.1	L2
6 (b)	State and prove Lami's theorem	6M	20ESX04.1	L3
	OR			
7 (a)	State and Explain the concept of Equilibrium	4M	20ESX04.1	L2
7 (b)	Two spheres each of 1000N and of radius 25cm rest in a horizontal channel of width 90cm as Shown in figure. Find the reaction at the point of Contact A, B and C 	8M	20ESX04.1	L2
8 (a)	What is the value of P in the system shown in the figure to cause the motion to impend? Assume the pulley is smooth and coefficient of friction between the other two contact surfaces is 0.20 	8M	20ESX04.2	L3
8 (b)	Define the following (i) Law of transmissibility (ii) Parallelogram law of forces	4M	20ESX04.2	L2
	OR			

9 (a)	A body of weight 200 N is placed on a rough horizontal plane. If the coefficient of friction between the body and horizontal plane is 0.3, determine a) Horizontal force required to impend motion b) Pull at an angle 30^0 to horizontal required to impend motion 	7M	20ESX04.2	L2
9 (b)	Differentiate between the angle of repose and angle of friction	5 M	20ESX04.2	L3
10 (a)	Locate the centroid of T – section shown in figure 	7M	20ESX04.3	L3
10(b)	Explain briefly about Centre of Gravity using Varignon's theorem	5M	20ESX04.3	L2
	OR			
11 (a)	Determine the centroid of a triangle having base width b and height h	6M	20ESX04.3	L3
11(b)	Locate the centroid of the following figure 	6M	20ESX04.3	L2
12 (a)	A man weight W Newton entered a lift, which moves with an acceleration of a m/sec^2. Find the force exerted by the man on the floor of lift when a) Lift is moving downward b) Lift is moving upward	5M	20ESX04.4	L3
12(b)	A motorist travelling at a speed of 70 kmph, suddenly applies brakes and halts after 50m. Determine a) The time required to stop the car b) The coefficient of friction between the tyres and the road 	7M	20ESX04.4	L3
	OR			

13(a)	A Particle is projected vertically upwards from the ground with an initial velocity of u m/sec. find a) The time taken to reach the maximum height b) The maximum height reached c) Time required for descending d) Velocity when it strikes the ground. Consider the upward motion of the particle	6M	20ESX04.4	L3
13(b)	A small Steel ball is shot vertically upwards from the top of a building 25m above the ground with an initial velocity of 18 m/sec a) In what time, it will reach the maximum height. b) How high above the building will the ball rise	6M	20ESX04.4	L3
14	Find the Power of a locomotive, drawing a train whose weight including that of engine is 420 kN up an incline 1 in 120 at a steady speed of 56 kmph, the frictional resistance being 5 N/kN. While the train is ascending the incline, the steam is shut off. Find how far it will move before coming to rest, assuming that the resistance to motion remains the same	12M	20ESX04.5	L3
	OR			
15	Derive the Work Energy equation for translation using Newton law of motion	12M	20ESX04.5	L3

Semester End Examination, May / June 2021
Model Question Paper

Degree	B. Tech. (U. G.)	**Program**	CE/ME			**Academic Year**	2020 - 2021
Course Code	20BSX31	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	II
Course	**Engineering Physics**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any two difference between Fresnel's and Fraunhofer diffraction	20BSX31.1	L2
2	Define spontaneous and stimulated emission of radiation	20BSX31.2	L1
3	Define Dielectric polarization	20BSX31.3	L1
4	Define reverberation time	20BSX31.4	L1
5	Define unit cell	20BSX31.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Derive conditions for dark and bright fringes in case of thin films reflective system	9M	20BSX31.1	L2
6 (b)	Explain the concept of coherence	3M	20BSX31.1	L2
	OR			
7 (a)	Deduce conditions for central maxima and minims in Fraunhofer single slit experiment	8M	20BSX31.1	L2
7 (b)	Derive condition for maximum orders possible with a grating	4M	20BSX31.1	L2
8 (a)	Explain the construction and working of a Ruby laser. What are the merits of this laser?	8M	20BSX31.2	L2
8 (b)	Interpret any four applications of lasers	4M	20BSX31.2	L2
	OR			
9 (a)	Explain the classification of fibers based on modes and refracting index profile	9M	20BSX31.2	L2
9 (b)	Explain any three applications of optical fibers	3M	20BSX31.2	L2
10 (a)	Explain in detail the classification of magnetic materials	8M	20BSX31.3	L1
10 (b)	Compare the differences between soft and hard magnetic materials	4M	20BSX31.3	L2
	OR			
11 (a)	Define various types of polarizations in a dielectric material	8M	20BSX31.3	L1
11 (b)	Outline the applications of dielectric materials	4M	20BSX31.3	L2
12 (a)	Derive Sabine's formula using growth and decay method	10M	20BSX31.4	L2
12 (b)	What is reverberation	2M	20BSX31.4	L1
	OR			
13 (a)	Write any one method to produce ultrasonics	8M	20BSX31.4	L2
13 (b)	Write a brief note on applications of NDT	4M	20BSX31.4	L1
14	Show that the packing fraction of FCC is greater than SC and BCC	12M	20BSX31.5	L2
	OR			
15 (a)	Explain Braggs law of X-ray diffraction	6M	20BSX31.5	L2
15 (b)	Explain the powder method of X-ray diffraction	6M	20BSX31.5	L2

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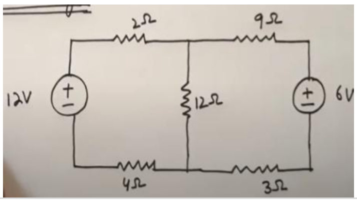
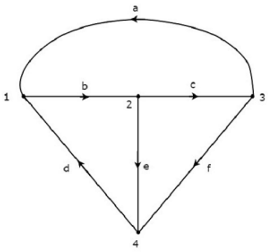
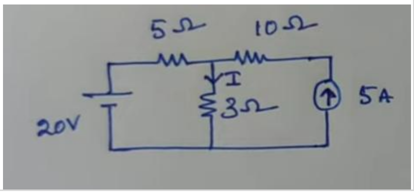
Semester End Examination, October, 2021

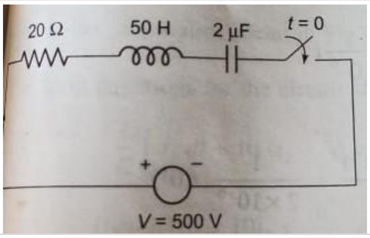
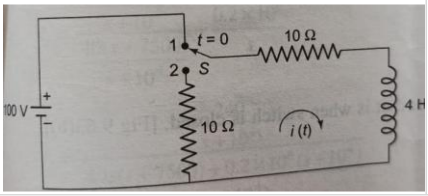
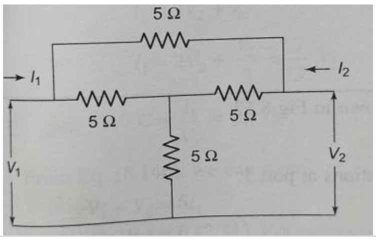
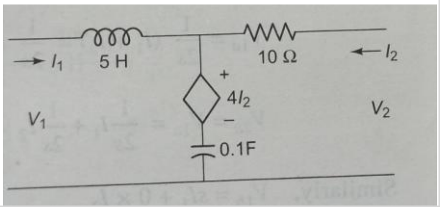
Degree	B. Tech. (U. G.)	**Program**	ECE			**Academic Year**	2020 - 2021
Course Code	20EE201	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	II
Course	**Network Analysis and Synthesis**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define branch, node, graph and tree of a network	20EE201.1	L1
2	List any four properties of Positive real Function	20EE201.2	L1
3	Define time constant and write its significance	20EE201.3	L1
4	Give the conditions of Series and Parallel resonance	20EE201.4	L1
5	Draw the equivalent h-parameter model of a two port network	20EE201.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Find the mesh currents of the given network using mesh analysis 	6M	20ESX05.1	L3
6 (b)	State the steps followed for Tie Set Matrix with an example	6M	20ESX05.1	L2
	OR			
7 (a)	Explain the procedure for nodal analysis with an example	6M	20ESX05.1	L2
7 (b)	From the given graph find the Incidence matrix, Tie set matrix and Cut set matrix 	6M	20ESX05.1	L3
8 (a)	Test whether the following function is positive real or not? F(s)=(S^2 +6S+5)/(S^2 +9S +14)	6M	20ESX05.2	L2
8(b)	nd the current through the 3 ohm resistor of the given network by using superposition theorem. 	6M	20ESX05.2	L3
9 (a)	Realize Z(s) = (S^3 +4S)/(S^4 +10S^2+9)in Cauer I forms	6M	20ESX05.2	L3
9 (b)	State and explain the properties of positive real function	6M	20ESX05.2	L2

10	From the RLC circuit given find i(0+), di/dt and d^2i/dt at t=0+, if the switch is closed at t=0 	12M	20ESX05.3	L3
	OR			
11 (a)	Evaluate the initial conditions procedure for R.L and C	6M	20ESX05.3	L2
11(b)	For the network given the switch is moved from position 1 to position 2. under steady state condition find the value of current i(t) using Laplace transform method 	6M	20ESX05.3	L3
12	Derive the expression for self and mutual inductance with neat diagrams	12M	20ESX05.4	L2
	OR			
13	A series RLC circuit has to be designed so that it has a bandwidth of 320 rad/sec. Inductance of the coil is 0.2 H. If it has to resonate at 3500 rad/sec, determine the resistance of the coil and capacitance of the condenser. If the applied voltage 150V , determine the voltage across across capacitor and coil.	12M	20ESX05.4	L3
14	Find the Y- parameters of the network 	12M	20ESX05.5	L3
	OR			
15(a)	Derive the relation between h-parameters and Z-parameters of a two port networks	6M	20ESX05.5	L2
15(b)	Find the Z- parameters of the network 	6M	20ESX05.5	L2

NSRIT

Semester End Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	Common to All			**Academic Year**	2020 - 2021
Course Code	20BSX12	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	II
Course	**PARTIAL DIFFERENTIAL EQUATIONS AND VECTOR CALCULAS**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Form the PDE by eliminating arbitrary constants a and b from $z = ax + by + a^2 + b^2$	20BSX12.1	L1
2	Solve (D - D') $(D + D' - 3)z$ = 0	20HSX12.2	L2
3	Compute $\beta(\frac{1}{2}, \frac{1}{2})$	20HSX12.3	L2
4	Define Solenoidal and Irrotational vectors	20HSX12.4	L1
5	Write the Statement of Gauss divergence Theorem	20HSX12.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Form PDE by eliminating " f " from $xyz = f(x^2 + y^2 + z^2)$	6M	20BSX12.1	L2
6 (b)	Solve $x^2 (y - z)p + y^2(z - x)q = z^2 (x - y)$	6M	20BSX12.1	L3
	OR			
7 (a)	Solve $(\frac{p}{2} + x)^2 + (\frac{q}{2} + y)^2 = 1$	8M	20BSX12.1	L3
7 (b)	Solve $z = px + qy + \sqrt{p^2 + q^2 + 1}$	4M	20BSX12.1	L2
8 (a)	Solve$(D^2 - 2DD')z = e^x + x^2 y.$	6M	20BSX12.2	L3
8 (b)	Solve $\left(4D^2 - 4DD' + D'^2\right)z = 16\log(x + 2y)$	6M	20BSX12.2	L2
	OR			
9 (a)	(D + D' $- 1)(D + 2D' - 3)z = 4 + 3x + 6y$	6M	20BSX12.2	L2
9 (b)	Solve $y^3 \frac{\partial z}{\partial x} + x^2 \frac{\partial z}{\partial y}$ = 0 by the method of separation variables	6M	20BSX12.2	L3
10 (a)	Prove that $\int_0^{\frac{\pi}{2}} \sqrt{cot\theta}\ d\theta = \frac{1}{2}\Gamma\left(\frac{1}{4}\right)\Gamma\left(\frac{3}{4}\right)$	6M	20BSX12.3	L3
10 (b)	Evaluate $\int_0^a \int_0^x \int_0^{x+y} e^{x+y+z}\, dzdydx$	6M	20BSX12.3	L2
	OR			
11 (a)	Prove that $\int_0^1 \frac{x}{\sqrt{1-x^5}} dx = \frac{1}{5}\beta(\frac{2}{5}, \frac{1}{2})$	6M	20BSX12.3	L3
11 (b)	Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \frac{dy\ dx}{1 + x^2 + y^2}$	6M	20BSX12.3	L2
12 (a)	Find the Directional Derivative of the function $f = x\,y\,z^2 + xz$ at the point (1, 1, 1) in a direction of the normal to the surface $3xy^2 + y - z = 0$ at the point	6M	20BSX12.4	L3

	(1, 1, 1).			
12 (b)	Show that $(x^2 - yz)\,\bar{\imath} + (y^2 - zx)\,\bar{\jmath} - (z^2 - xy)\bar{k}$ is irrotational and hence find scalar potential	6M	20BSX12.4	L3
	OR			
13 (a)	If $\bar{F} = grad(x^3 + y^3 + z^3 - 3xyz)$ Find div $\bar{F}$ and curl $\bar{F}$	6M	20BSX12.4	L3
13 (b)	Prove that $div(grad\ r^m) = m(m+1)r^{m-2}$	6M	20BSX12.4	L2
14	Verify Green's theorem for $\int_c [xy + y^2]dx + x^2\,dy]$, where C is bounded by $y = x \; and \; y = x^2$	12M	20BSX12.5	L3
	OR			
15	Verify Stoke's theorem for $\bar{F} = (x^2 + y^2)\bar{\imath}$ - 2xy $\bar{\jmath}$ taken around the rectangle bounded by the lines $x = \pm a$, y = 0, y = b	12M	20BSX12.5	L3

NSRIT

Semester End Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	ECE			**Academic Year**	2020 - 2021
Course Code	20EC201	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	II
Course	**Principles of Electronics & Communication Systems**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define law of mass action	20EC201.1	L1
2	What is virtual ground?	20EC201.2	L1
3	What is the difference between continuous time and discrete time signals?	20EC201.3	L1
4	Define Sampling	20EC201.4	L1
5	Define critical angle	20EC201.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Describe the terms intrinsic and extrinsic semiconductors of both P type and N type	6M	20EC201.1	L1
6 (b)	State and explain the Hall Effect. Mention its applications	6M	20EC201.1	L2
	OR			
7 (a)	Explain the drift and diffusion currents of a semiconductor	6M	20CS403.1	L2
7 (b)	Explain about Fermi level in intrinsic and extrinsic semiconductor materials	6M	20CS403.1	L2
8 (a)	Draw the block schematic of an op-amp and briefly explain each block	6M	20EC201.2	L2
8 (b)	Obtain the closed loop gain for ideal non inverting amplifier	6M	20EC201.2	L1
	OR			
9 (a)	List and explain the characteristics of an ideal op-amp	6M	20EC201.2	L1
9 (b)	Draw and explain the pin diagram of IC 741op-amp	6M	20EC201.2	L2
10 (a)	List and state all the elementary continuous time signals	6M	20EC201.3	L1
10 (b)	Explain the elements of communication system	6M	20EC201.3	L2
	OR			
11 (a)	Explain the need for Modulation	6M	20EC201.3	L2
11 (b)	What is amplitude modulation and write its mathematical expression with neat diagrams	6M	20EC201.3	L1
12 (a)	Explain natural Sampling and Flat-top Sampling	6M	20EC201.4	L2
12 (b)	With a neat sketch, explain the principle and operation of PCM	6M	20EC201.4	L2
	OR			
13 (a)	Sketch the block diagram of BASK generation. Draw the BASK waveform for the data 1 0 1 1 1 0 1 0 1	6M	20EC201.4	L2
13(b)	With a neat diagram explain about TDM	6M	20EC201.4	L2
	OR			
14(a)	Draw and explain the working principle of an Optical Communication system	6M	20ESX02.5	L2
14 (b)	What are different optical Transmitters and receivers and explain about LASER	6M	20ESX02.5	L2

OR				
15(a)	Draw and explain the working principle of a Cellular Mobile Communication system	6M	20EC201.5	L2
15(b)	Differentiate Analog and Digital Cellular Network Systems	6M	20EC201.5	L2

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Semester End Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	EEE			**Academic Year**	2020 - 2021
Course Code	20CS403	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	II
Course	**PYTHON PROGRAMMING**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Write about input & Output functions	20CS403.1	L1
2	What is a namespace?	20CS403.2	L1
3	What are default & keyword arguments?	20CS403.3	L1
4	Define class, object in python	20CS403.4	L1
5	What is Matplotlib?	20CS403.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What are different applications of Python? Give examples	4M	20CS403.1	L1
6 (b)	List out operators. Explain the following operators with example i. Bitwise ii. Identity iii. Membership	8M	20CS403.1	L2
	OR			
7 (a)	Discuss bout variables and assignments	6M	20CS403.1	L2
7 (b)	Write a Python program to convert height in feet and inches to cm. [1 feet = 12 inch and 1 inch= 2.54 cm] (Sample input: 2 feet 7 inch Sample output: 78.74 cm)	6M	20CS403.1	L3
8 (a)	Describe Python jump statements with examples	6M	20CS403.2	L2
8 (b)	Write a Python program to find the given number is palindrome or not	6M	20CS403.2	L3
	OR			
9 (a)	Explain about data encryption in python	5M	20CS403.2	L2
9 (b)	Discuss about dictionaries in Python	7M	20CS403.2	L2
10 (a)	Explain about required and variable-length arguments.	6M	20CS403.3	L2
10 (b)	What is recursion? Explain the recursion concept with suitable example	6M	20CS403.3	L3
	OR			
11 (a)	Discuss in detail about the import statement	6M	20CS403.3	L2
11 (b)	Write a brief note on PIP. Explain installing packages via PIP	6M	20CS403.3	L1
12 (a)	Write a C program to maintain a book structure containing name, author and pages as structure members. Pass the address of structure variable to a user defined function and display the contents	6M	20CS403.4	L2
12 (b)	Define a structure called complex consisting of two floating point numbers x and y and declare a variable p of type complex. Assign initial values 0.0 and 1.1 to the members	6M	20CS403.4	L2
	OR			
13	Compare the differences between structure and union. Explain usage of structure in terms of definition, declaration and accessing members with syntax and example	12M	20CS403.4	L2

14	With syntax and example describe the following file handling functions a. fopen() b. fclose() c. fread() d. fwrite() e. fscanf() f. fprintf()	12M	20CS403.4	L2
	OR			
15 (a)	Describe pre-processor directives	6M	20CS403.5	L2
15 (b)	Write a program for adding two integers and display the sum by taking input through command line arguments	6M	20CS403.5	L2