

**SCHEME OF VALUATION**

(Scoring Indicators)

Revision:2021

Course Name:Discrete Mathematics

Course Code:3341

QID:2109230389

Qst No	Scoring Indicator	Split up Score	Sub Total	Total															
<b>I</b>	<b>PART A</b>			<b>9</b>															
1	$2^n$	1	1																
2	p	1	1																
3	n!	1	1																
4	mn	1	1																
5	Domain	1	1																
6	Isolated vertex	1	1																
7	(p,q) graph	1	1																
8	Abelian	1	1																
9	Cyclic																		
<b>II</b>	<b>PART B</b>			<b>24</b>															
1	A={2,4,7,8}    B={4,5,6,7} AUB = {2,4,5,6,7,8} A∩B = {4,7}	1.5 1.5	3																
2	<table border="1" style="width:100%; text-align:center;"> <tr> <td>p</td> <td>q</td> <td><math>P \wedge q</math></td> </tr> <tr> <td>T</td> <td>T</td> <td>T</td> </tr> <tr> <td>T</td> <td>F</td> <td>F</td> </tr> <tr> <td>F</td> <td>T</td> <td>F</td> </tr> <tr> <td>F</td> <td>F</td> <td>F</td> </tr> </table>	p	q	$P \wedge q$	T	T	T	T	F	F	F	T	F	F	F	F	3	3	
p	q	$P \wedge q$																	
T	T	T																	
T	F	F																	
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3	{ },{1},{2},{3},{1,2},{1,3},{2,3},{1,2,3 }	3	3																
4	<b>INDEPENDENCE</b> There are 12 letters of which N appears 3 times,E appears 4 times and D appears 2 times and the rest are all different.Therefore the required number of arrangements = $12!/3!4!2!=1663200$	3	3																
5	$f(x) = 3x+7$ $f(x_1) = f(x_2)$ $3x_1 + 7 = 3x_2 + 7$ $x_1 = x_2$	3	3																
6	Number of vertices=10 Sum of degree of vertices = $6 \times 10 = 60$ From theorem ,sum of the degree of vertices = $2 E $ $2 E  = 60$ $ E  = 60/2 = 30$	3	3																
7	Tree :A tree is a connected acyclic graph .That is a connected graph having no cycles.Its edges are called branches Spanning tree:A subgraph H of a connected graph G is a spanning tree of G if H is a tree containing every vertex of G	1.5 1.5	3																
8	In pre-order traversal,first,root node visited,then left sub-																		

	tree and after that right sub-tree visited. The process of pre order traversal can be represented as root $\rightarrow$ left $\rightarrow$ right	3	3																															
9	<p>Semi group: The system <math>(A, *)</math> is said to be semi-group if it satisfies the following properties.</p> <ol style="list-style-type: none"> <li>1. The operation <math>*</math> is a closed operation on set A</li> <li>2. The operation <math>*</math> is an associative operation</li> </ol> <p>Monoid: A monoid is a set that is closed under an associative binary operation and has an identity element.</p>	1.5 1.5	3																															
10																																		
<b>PART C</b>				42																														
III																																		
IV	$n(A) = 28$ $n(B) = 32$ $n(A \cup B) = 50$ $n(A \cap B) = ?$ $n(A \cup B) = n(A) + n(B) - n(A \cap B)$ $n(A \cap B) = n(A) + n(B) - n(A \cup B)$ $= 28 + 32 - 50 = 10$	7	7																															
V	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>P</th> <th>q</th> <th><math>\neg p</math></th> <th><math>p \vee q</math></th> <th><math>\neg(p \vee q)</math></th> <th><math>\neg(p \vee q) \rightarrow \neg p</math></th> </tr> </thead> <tbody> <tr> <td>T</td> <td>T</td> <td>F</td> <td>T</td> <td>F</td> <td>T</td> </tr> <tr> <td>T</td> <td>F</td> <td>F</td> <td>T</td> <td>F</td> <td>T</td> </tr> <tr> <td>F</td> <td>T</td> <td>T</td> <td>T</td> <td>F</td> <td>T</td> </tr> <tr> <td>F</td> <td>F</td> <td>T</td> <td>F</td> <td>T</td> <td>T</td> </tr> </tbody> </table>	P	q	$\neg p$	$p \vee q$	$\neg(p \vee q)$	$\neg(p \vee q) \rightarrow \neg p$	T	T	F	T	F	T	T	F	F	T	F	T	F	T	T	T	F	T	F	F	T	F	T	T	7	7	
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	F	T	F	T	F	T			
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V =II	<p>Reflexive  <math>a-a = 0</math> is a multiple of 3 .  R is reflexive  Symmetric  <math>aRb</math>  <math>a-b</math> is a multiple of 3  <math>b-a</math> is a multiple of 3  <math>bRa</math>  Therefore R is symmetric  Transitive  <math>aRb</math> and <math>bRc</math>  <math>a-b</math> is a multiple of 3 and <math>b-c</math> is a multiple of 3  <math>a-b+b-c = a-c</math> is a multiple of 3  <math>aRc</math>  R is transitive  Equivalence Relation  R is reflexive ,symmetric and transitive. Therefore R is an equivalence relation</p>						7	7	
VIII	<p>The function f is one-to-one ,for <math>f(x_1)=f(x_2)</math>  <math>2x_1 = 2x_2</math>  <math>x_1= x_2</math>  Also given any real number y in R there exists <math>y/2</math> in R such that <math>f(y/2)=2.(y/2)</math>Hence f is onto</p>						7	7	ii
VIX	<p>Let <math>G=(V,E)</math> be an undirected graph with n number of vertices and e number of edges.Let <math>v_1,v_2,\dots,v_k</math>be the odd degree of vertices and <math>v_1',v_2',\dots,v_m'</math> be the even degree of vertices .By Hand shaking theorem we have <math>2 E =2e=\sum_{i=1}^n d(v_i)</math> consider the vertices with odd degree and even degree separately.  <math>\sum_{i=1}^k \text{deg}(v_i) + \sum_{j=1}^m \text{deg}(v_j')=2e</math>  <math>\sum_{i=1}^k \text{deg}(v_i) + \text{even number}=2e</math> . <math>\sum_{i=1}^k \text{deg}(v_i)=2e - \text{even number} = \text{even}</math></p>						7	7	
X	<p>First let us consider a simple graph <math>K_n</math> with n vertices.In a complete graph, every vertex is adjacent to every other vertices.so each vertex is adjacent to remained n-1 vertices.There are (n-1) edges incident on a vertex.That is the degree of a vertex is n-1.Therefore the total sum of the degree of a graph is <math>n(n-1)</math> .By Hand shaking theorem ,the sum of the degree of the vertices is twice the number of the edges.sum of the degree of the vertices =<math>n(n-1)=2e</math>  <math>e=n(n-1)/2</math> .Therefore maximum edges in a complete graph is <math>n(n-1)/2</math></p>						7	7	
XI	<p>Let G be a connected graph .If G is a tree we are done.If G is not a tree,it must contain a cycle.Remove an edge from the cycle.The new graph is still connected.If it is acyclic,then it is a tree and hence a spanning tree.Otherwise it must have another cycle,Remove an edge from this cycle.Continuethe procedure until a subgraph H is acyclic.It is a tree.It also contains every vertex of G. so it is a spanning</p>						7	7	



Decision taken by the JCTE Office on 01.01.2025 based on the complaints received from the students of various Polytechnic Colleges in connection with the Question papers of Diploma Examination November 2024 and recommendations of expert committee.

**1. Subject Code :-3025**

R (21)	3025 Machine Drawing	An ambiguity occurred in Part A Questions, ie answer any one of the questions instead of any two	15 marks each
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Decision:-

- \* If the students have attended two questions , I(1) or I(2) and I(3) or I(4) from Part A, then value the two answers.
- \* If the students have attended only one question from Part A,
  - (a) The marks secured will be considered as out of 60
  - (b) The Percentage of marks secured out of 60 shall be calculated and the same percentage of marks out of 15 shall also be added to the marks secured to arrive at the actual marks admissible out of 75.

**2. Subject Code :-3341**

R(21)	3341 Discrete Mathematics	Part A -6,7,8,9 Part B-6,7,8,10 Part C- IX,X,XI,XII	1 Mark each 3 Marks each 7 Marks each
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Decision:-

- \* Questions 6,7,8 & 9 of Part A , 6,7,8 & 10 of Part B and IX,X,XI and XII of Part C are cancelled.
- Value the remaining questions.
- \* Part B -Consider the marks of 4 highest scored questions out of remaining 6 questions.

- \* The marks secured will be considered as out of 45
- \* The percentage of marks secured out of 45 shall be calculated and the same percentage of marks out of 30 shall also be added to the marks secured to arrive at the actual marks admissible out of 75.

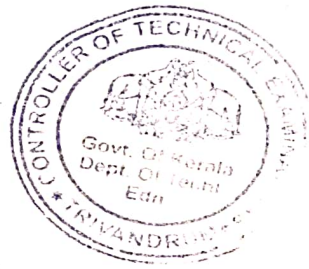
**3. Subject Code :-3043**

R(21)	3043 Electronic Circuits	Part B -3,9	3 Marks each
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Decision:-

Part B

- \* Question No: 3 and 9 are cancelled
- \* Consider the marks of 6 highest scored questions out of remaining 8 questions
- \* Marks secured will be considered as out of 69
- \* The percentage of marks secured out of 69 shall be calculated and the same percentage of marks out of 6 shall also be added to the marks secured to arrive at the actual marks admissible out of 75.



V.V Ray  
Joint Controller

Joint Controller of  
Technical Examinations