Faculty of Engineering and Technology			
Ramaiah University of Applied Sciences			
Department	Computer Science and Engineering	**Programme**	B. Tech. in CSE
Semester/Batch	5th Semester/2017		
Course Code	CSC301A	**Course Title**	Discrete Mathematics-2
Course Leaders	Ms. Pallavi R. Kumar and Mr. Narasimha Murthy K. R.		

Assignment		
Reg.No.		**Name of Student**	

Sections		Marking Scheme		Max Marks	First Examiner Marks	Moderator
					Marks	
Question 1	A	**Specification of constraints**		02		
	B	**Assumptions**		01		
	C	**Application of Graph colouring method**		05		
	D	**Time Table Preparation**		02		
			Part-A Max Marks	10		
Question 2	A	**Specification of constraints**		02		
	B	**Assumptions**		01		
	C	**Formulation and Method of Solution of LPP**		03		
	D	**Solution**		04		
			B.1 Max Marks	10		

Course Marks Tabulation				
Component-1 (C) Assignment	**First Examiner**	**Remarks**	**Moderator**	**Remarks**
Question 1				
Question 2				
Marks (out of 20)				

Signature of First Examiner   **Signature of Moderator**

Note to Students

1. The last date for assignment submission is **11th November 2019.**
2. Restrict the document to a maximum of 10 pages
3. The printed assignment must be submitted to the course leader
4. Documental evidence for all the components/parts of the assessment such as the reports, photographs, laboratory exam / tool tests are required to be attached to the assignment report in a proper order.
5. It is essential that all the sources used in preparation of the assignment must be suitably referenced in the text.

Question 1 (10 Marks)

Students are required to use graph coloring to optimally solve the scheduling problem expressed in the scenario below.

Consider that there are 200 students studying 5th semester in RUAS. As part of their curriculum, these students have to take laboratory examinations for three subjects: Computer Networks, Computer Simulation and Operating Systems. There are two laboratories (103C and 103D) allotted for conducting these examinations. Each of these laboratories are equipped with 30 computers and can accommodate three Examination slots per day.

Considering the conditions expressed above, you are required to prepare a schedule to conduct the three laboratory examinations for all the batches in minimum number of days.

Prepare a document, providing the solution in detail, with particular emphasis on:

    a. Specification of constraints for the scheduling problem
    b. Assumptions made, if any, along with justification
    c. The graph model used and the colouring algorithm for it
    d. The generation of a timetable based on the colouring carried out

Question 2 (10 Marks)

Students are required to use Linear Programming to solve the external examiner assignment problem expressed in the scenario below, in an optimal way so as to minimize the total remuneration paid to the examiners. Consider that this scenario is an extension to the one presented in Question 1 above.

Once the laboratory examinations are scheduled, RUAS invites external examiners to evaluate the students. The Table below details the availability of external examiners and the remuneration that they are to be paid per day. As per the rules governing the conduction of laboratory examinations, no external examiner can be invited for more than three days.

Table 1

Teacher	Availability	Remuneration per Day
A	3 days	₹ 2000
B	1 day	₹ 3400
C	4 days	₹ 3000
D	2 days	₹ 2500

Considering the conditions expressed in the scenario, you are required to apply Linear Programming to solve the problem so that external examiners are assigned in such a way that the total remuneration amount paid by RUAS is minimum.

Prepare a document, providing the solution in detail, with particular emphasis on:

    a. Specification of constraints for the external examiner assignment problem
    b. Assumptions made, if any, along with justification
    c. Formulation of the Linear Programming Problem (LPP)
    d. Method used to solve the LPP and the reason to choose the method

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