UNIVERSITY OF RUHUNA
BACHELOR OF COMPUTER SCIENCE (SPECIAL) DEGREE
(SEMESTER II) EXAMINATIONS
AUGUST - 2016

Subject: Computer Science
Course unit: CSC4152 (Enterprise Modelling) Duration: 2 Hours

Answer **All** questions. Number of Questions: 04

1.

a. Which of the following is **not** a key idea behind the Business Motivation Model?
   (i) Activities done in an enterprise are the results of how they react to the change in their business environment.
   (ii) Goal-oriented business model describing desired states should be done before carrying out any information system development activities.
   (iii) Flexibility of modelling can be obtained by building separate models of organizational units.
   (iv) Business decisions are hard to trace back to their original motivations.

(10 marks)

b. Consider the following sentences.
   A. To increase employability of students.
   B. To develop soft skills of students.
   C. To provide theory and application integrated subject knowledge to students.
   D. Introduce outcome based education.
   E. Within an year, revise the level I curriculum.
   F. Encourage student centered learning.
   G. The new curriculum should have at least three soft skill development oriented course units in Level II and Level III.
   H. Organize a singing and drama competition.
   I. Conduct two workshops on outcome based education.
   J. Focus on professionalism, oral communication, leadership and aesthetic related soft skills development.
   K. For each level II practical course, give a mini project that will carry 30% of marks for the final grade.
   L. Minimum 20% of the new level I curriculum should use continuous assessment methods.
   M. Funding is available for reforms in higher education sector.
   N. All the soft skills related course units shall be offered as optional FSC courses.
   O. Number of registered FSC credits shall not exceed 06 credit values.

   (i) Classify above sentences as goals, objectives, strategies, tactics, influences and business rules.

(42 marks)

(ii) Construct a BMM goal model by clearly showing top goal(s), sub goals, objectives, strategies, tactics, business rules, and influences one could identified in b(i) above.

Your model should show associations between:

- goals and corresponding objectives
- goals and corresponding means (strategies and tactics)

(48 marks)

2.

a. Consider the following business rule written in formal technical format.

When Check_for_waiting_customers (customer.id)
If customer.type = paying
then Report_queue_order (queue.priority = none)

(i) What is the information regarding other types of enterprise models that can be derived by designers from the above business rule?

(ii) Draw partial enterprise model showing how the above business rule is connected to other types of enterprise models you have written in b(i) above.

(30 marks)

b. Which of the following statements is correct regarding event-driven process chains?

(i) Functions are active elements that describe situations after an activity is carried out.

(ii) Events in event-driven process chain describe process steps.

(iii) Connectors in event-driven process chains are used to represent process logic.

(iv) Events are triggered by functions.

(10 marks)

c. The following describes the process of managing examination eligibility of Science Faculty students.

The process of checking exam eligibility of students, for course units, starts after all the attendance details for the course are entered. Once it is done, the attendance percentage is calculated. If the student has required amount of attendance percentage he will be allowed to sit for the examination. Otherwise, he can submit an appeal or else the process ends. For each submitted appeal, the documents are checked to see the sufficient proofs for reasons given in the appeal for not attending lecturers/practical classes and the student is interviewed to check the credibility of the submitted documents. A decision is then made about either making him eligible for sit for the exams or not. If either the student had the required percentage in the first place or obtained it after the appeal then the exam admission card is printed. After the admission is printed the student is contacted to inform him to collect the admission card. When the student is contacted the process ends. Otherwise the action is repeated until the student is contacted.

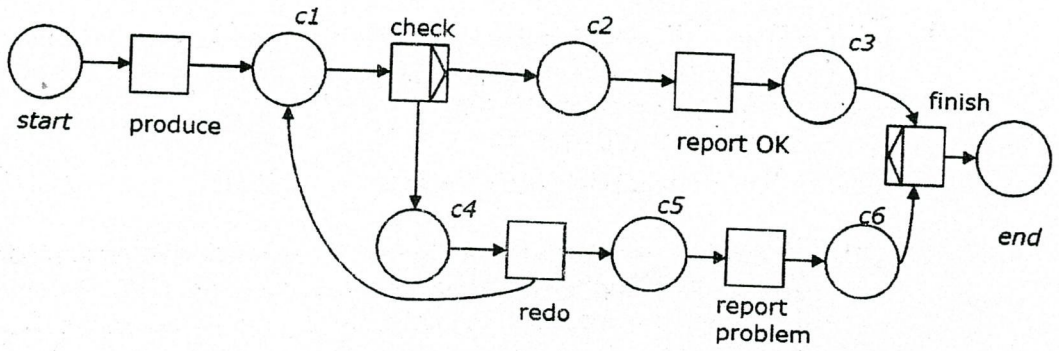
Construct an EPC diagram for the process described above. You may need to make your own assumptions to complement the above text and they should be stated explicitly.

(60 marks)

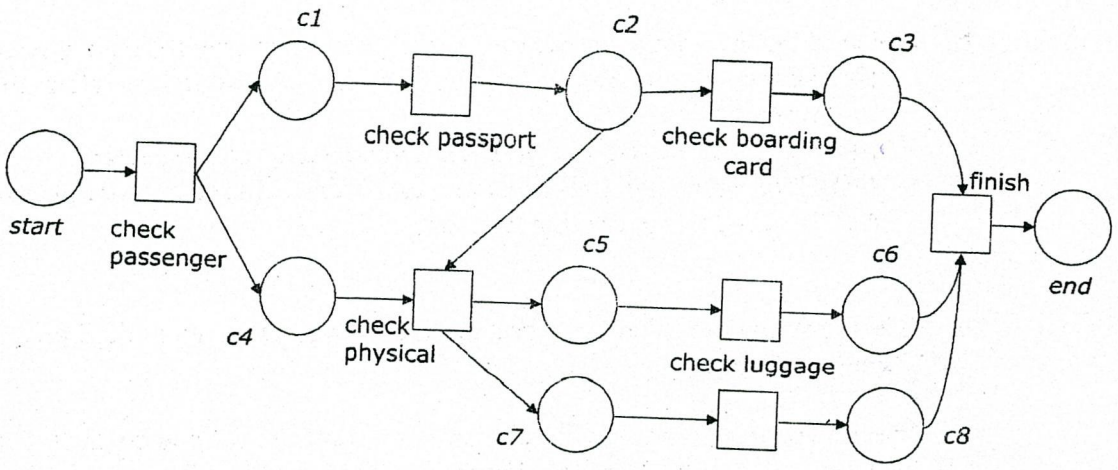
3.

a. Determine the problems in the petri net process models given below.

(i)



(ii)



(40 marks)

b. Consider the following description regarding a possible procedure for organizing a Welcome party for the new students at the Faculty of Science.

When the students want to organize parties they have to make a formal request to the Dean of the faculty. After sending the letter, the students look for a suitable location.

Location can be indoor or outdoor. If the location is indoors, the auditorium will be reserved. In case of an outdoor location, a party tent and a place have to be arranged, along with a permit for outdoor music event. No permit for music event is required if the location is indoors.

There are two sorts of music: live or CD's. If CD's are chosen, then a sound system has to be arranged. In case of live music, things are more complicated. First, a band is selected. Then, an invitation letter is sent to the band inviting it to play for the party. If the band does not react within a week, a new band is selected and the procedure is repeated.

If the students cannot find a band within ~~seven~~ 14 days, they switch to CD's.

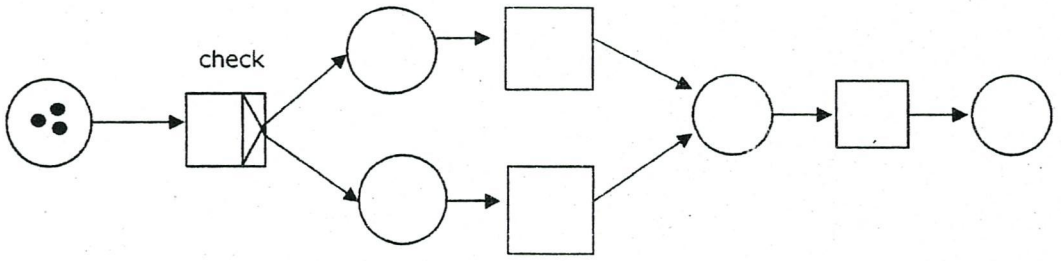
After deciding on the location and the music, they also take care of food and drinks. After party is being held, total budget details is sent to the DVC through Dean.

Model this process by means of a Petri net. You may make appropriate assumptions.

(60 marks)

4.

a. Construct the reachability graph for the petri net given below.



(30 marks)

b. Consider the workflow net below for security checks in an application processing center.

There are two security checks: body check and explosive check, which are done to ensure security at the center. The body check takes an average 5 minutes and 90%, people pass this check. Explosive check takes average 4 minutes 80% pass this test. The two checks are done in parallel. If both these checks are OK, then the person is allowed to meet the officer processing applications, otherwise the person is arrested. Application processing takes 20 minutes on average.

There is one resource for each task. On average, ten persons arrive per hour.

(i) Model the above workflow using petri net.
(ii) Compute resource utilization for each task.
(iii) Average cases in progress.
(iv) Average waiting time for each task.
(v) Average waiting time for the system.
(vi) Average system time for the whole process.

(70 marks)

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