

BACHELOR OF COMPUTER SCIENCE AND ENGINEERING
Fourth Year, Second Semester (Old) Examination, 2017

Programming Environment and User Interface Design

Time- Three Hours

Full Marks-100

Answer *Question no. 1* and *any four* from the rest

1. (i) Answer all questions: (5x4) =20
- a) What do you mean by petri net marking? Give example.
 - b) What do you mean by a *bounded* petri net?
 - c) Define *Affordance* of User Interface Design (UID).
 - d) What do you mean by synchronous and asynchronous groupware?
 - e) What is INTERNATIONALIZATION?
2. a. What are the firing rules of a transition in Petri net? What is the role of an inhibitor arc? What do you mean by *home state*? Draw a diagram of a *safe* Petri net?
- b. Suppose, two cars at a four way stop intersection must mutually exclude each other from the use of the intersection in order to prevent accidents that could occur by having multiple cars trying to pass through the intersection simultaneously. Design a Petri net structure that models the mutual exclusion of the cars and describe the reasons for selecting each component of that Petri net.
- (4+2+2+2)+10=20
3. What are the golden rules of UID? State the advantages and disadvantages of Command Language and Natural Language Interfaces? Write down the differences between Gulf of Evaluation and Gulf of Execution. What do you mean by Human Action Cycle and Norman Action Cycle? What do you mean by *usability*?

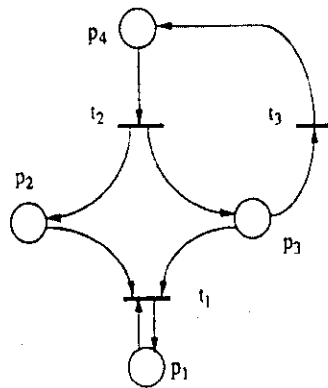
(4+4+4+6+2)=20

4. a. When a Petri net is called strictly conservative? Draw a diagram of a strictly conservative Petri net? Define *reversibility* of a Petri net. Can we remove self-loop from a Petri net?
 b. When a transition '*t*' is called *L2-live* and not in *L3-live* in a Petri net? Draw a Petri net diagram to show all possible levels of *liveliness* of transitions and explain each of the levels of *liveliness*.

$$(2+2+3+2)+(2+9)=20$$

5. How would you represent Producer-Consumer problem with bounded buffer as Petri net? Describe how *boundedness* is guaranteed in your solution. What is the significance of *Reachability* tree in Petri net? How can you derive it from a given Petri net? Derive the *coverability* tree for the Petri net given below.

$$(6+2+2+4+6)=20$$



6. Draw the diagram of Human Information Processing unit. What do you mean by Stroop effect? How a cognitive processor makes decisions? Define Hick-Hyman Law of Reaction Time to choice an element out of elements with equal and unequal probabilities. Define Fitt's law and Ruskin's law and state their significance and limitations.

$$(3+2+3+6+6)=20$$