BACHELOR OF COMPUTER SCIENCE AND ENGINEERING
Fourth Year, Second Semester Examination, 2018

Programming Environment and User Interface Design

Time- Three Hours   Full Marks-100

Different parts of the same section should be answered together.

S1: Answer *all from this section.*

(5x4) = 20

a. State the advantages and disadvantages of Command Language and Natural Language Interfaces?

b. What do you mean by synchronous and asynchronous groupware?

c. Define *Perception* and *Affordance* of User Interface Design (UID).

d. What are the golden rules of UID?

e. What do you mean by Ubiquitous Computing?

S2: Answer *all from this section.*

(5x2) = 10

a. What do you mean by Petri net?
b. What is the role of an inhibitor arc?
c. Can we remove self-loop from a Petri net?
d. What is the significance of *home state* in Petri net analysis?
e. Draw a diagram of an unbounded Petri net?

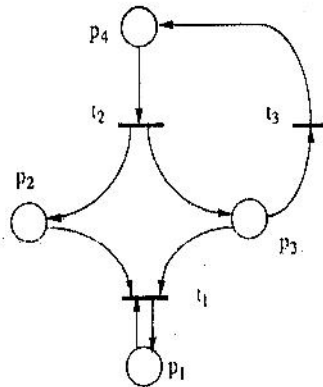**S3:** Answer *any five from this section.*

(5x2) = 10

a. What is Raskin's first law?
b. How can you derive *coverability* tree from a given Petri net?
c. Draw the diagram of Human Information Processing unit.
d. What do you mean by Stroop effect?
e. How a cognitive processor makes decisions?
f. What are the firing rules of a transition in Petri net?
g. What is INTERNATIONALIZATION?
h. What do you mean by multiparty grammar?

S4: Answer *any five from this section.*

(5x8) = 40

a. What do you mean by Human Action Cycle and Norman Action Cycle?

b. Draw a Petri net diagram to show all possible levels of *liveliness* of transitions and explain each of the levels of *liveliness*.

c. How would you represent Producer-Consumer problem with bounded buffer as Petri net and show *boundedness* is guaranteed in your solution.

d. Analyze Hick-Hyman Law of Reaction Time to choice an element out of elements with equal and unequal probabilities.

e. Define Fitt's law and state its significance and limitations.

f. 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.

g. Derive the *coverability* tree for the Petri net given below.

S5: Answer *any five from this section.*

(5x4) = 20

a. What do you mean by *Conservativeness* and *Safeness* of a Petri net?

b. Define Gulf of Evaluation and Gulf of Execution.

c. What is the difference between *Utility* and *Effectiveness* of UID?

d. When a transition 't' is called *L2*-live and not in *L3*-live in a Petri net?

e. What do you mean by *usability*?

f. Define *reachability* and *reversibility* of a Petri net.

g. Compare between menu driven and direct manipulation interaction styles.

h. What is the importance of perception in evaluating 3D user interfaces?