

**HUMAN AND COMPUTER INTERACTION
(CSEN 5241)**

Time Allotted : 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 4 (four) from Group B to E, taking one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A

1. Answer any twelve:

12 × 1 = 12

Choose the correct alternative for the following

- (i) Which of the following is not a valid text storage format?
 - (a) ASCII
 - (b) UML
 - (c) SGML
 - (d) XML.
- (ii) Moore's Law relates to which of the following?
 - (a) Computers getting faster with time
 - (b) Computers getting cheaper with time
 - (c) Computers getting stronger with time
 - (d) None of the other choices.
- (iii) The earliest paradigm of human computer interaction is
 - (a) Ubiquitous Computing
 - (b) Networking
 - (c) Timesharing
 - (d) Batch processing.
- (iv) In the context of human computer interaction, a mode is a
 - (a) A measure of outlier
 - (b) A human communication channel
 - (c) A model of user behaviour
 - (d) All of the other choices.
- (v) Which of the following is not a goal of evaluation?
 - (a) Assess extent of system functionality
 - (b) Assess effect of interface on user
 - (c) Identify specific problems
 - (d) All of the other choices are goals of evaluation.

- (vi) Which of the following is not a type of memory function in humans?
 - (a) Sensory
 - (b) Short-term
 - (c) Long-term
 - (d) All of the other choices are types of memory function in humans.
- (vii) Reasoning from event to cause is known as
 - (a) Deductive Reasoning
 - (b) Inductive Reasoning
 - (c) Abductive reasoning
 - (d) None of the other choices.
- (viii) Which of the following is not one of the principles to support usability?
 - (a) Learnability
 - (b) Flexibility
 - (c) Robustness
 - (d) All of the other choices are principles to support usability.
- (ix) Which of the following is not a universal design principle?
 - (a) Equitable use
 - (b) Imperceptible information
 - (c) Tolerance for error
 - (d) Size and space for approach and use.
- (x) Problems with communication via text arise from
 - (a) Presence of facial expression
 - (b) Absence of body language
 - (c) Both (a) and (b)
 - (d) Neither (a) nor (b).

Fill in the blanks with the correct word or phrase

- (xi) Repository for all our knowledge is called _____.
- (xii) A human error that involves correct understanding of system and goals, correct formulation of action, but incorrect action is called _____.
- (xiii) Predominant theoretical frameworks or scientific world views are called _____.
- (xiv) The arrangement of storing some programs temporarily on disk, thereby making RAM appear bigger, is referred to as _____.
- (xv) The goal of interaction design is, designing for maximum _____.

Group - B

- 2. (a) What are the characteristics of short-term memory (STM) in humans?
[[CO1](Understand/LOCQ)]
- (b) Explain the semantic network model of long-term memory (LTM) in humans with an example.
[[CO1](Remember/LOCQ)]

- (c) What are the mechanisms of retrieval from long-term memory (LTM) and which one is the simplest among them? [[CO2](Apply/IOCQ)]
3 + 5 + 4 = 12
3. (a) In a computer, how are short term memory and long term memory stored? [[CO1](Understand/LOCQ)]
- (b) Identify and briefly explain the different storage formats for texts. [[CO2](Remember/LOCQ)]
- (c) It has been observed that computer processor speed doubles every 18 months. What is the approximate time it takes for computer memory to double? At this rate, 20 MB of memory in 1991 will become how many units in 2002 (both year inclusive)? [[CO2](Evaluate/HOCQ)]
(2 + 2) + 4 + (2 + 2) = 12

Group - C

4. (a) Identify and briefly explain the major paradigm shifts in the interactions between humans and computers in the last few decades. [[CO1](Understand/LOCQ)]
- (b) In the context of human-computer interaction (HCI), what is a metaphor? What are the problems with the use of a metaphor? [[CO2](Analyze/IOCQ)]
- (c) In the context of human-computer interaction (HCI), what is multimodality? [[CO1](Understand/LOCQ)]
6 + (2 + 2) + 2 = 12
5. (a) With a diagram, explain the software development life cycle for interactive systems and highlight how it is different from the Waterfall model. [[CO3](Remember/LOCQ)]
- (b) What are the traditional categories for measuring usability and why are they important? [[CO4](Remember/LOCQ)]
- (c) Identify and briefly describe different types of prototypes. [[CO3](Remember/LOCQ)]
(4 + 2) + 3 + 3 = 12

Group - D

6. (a) What is your favourite software app based product or Web based system? Mention any four (4) of the universal design principles and explain whether or not you observe such principles being manifested in the design of your favourite software app based product or Web based system. [[C65](Evaluate/HOCQ)]
- (b) Who is a stakeholder of a system? Identify with justifications, the different types of stakeholders in airline booking system? [[CO4](Remember/LOCQ)]
(4 × 2) + (2 + 2) = 12
7. (a) Differentiate between goals and tasks. [[CO2](Analyse/IOCQ)]
- (b) What are the challenges with goal hierarchies? [[CO3](Remember/LOCQ)]
- (c) What is the GOMS model? [[CO4](Remember/IOCQ)]
4 + 4 + 4 = 12

Group - E

8. (a) In the context of socio-organizational issues, what is the free rider problem? Explain with a diagram how this problem is related to the need to develop a critical mass of users? [[CO4](Remember/LOCQ)]
- (b) Mention and briefly explain the stages of the CUSTOM process. [[CO5](Remember/LOCQ)]
- (3 + 3) + 6 = 12**
9. (a) “The mobile industry of today has somewhat of a split personality — each side with its own conflicting interests.” What are the different sides? Why do they have conflicting interests? [[CO6](Analyse/HOCQ)]
- (b) In the mobile handset you use today, identify the feature you like most and identify a principle of human-computer interaction (HCI) that has contributed most to the implantation of the feature. Justify your answer. [[CO5](Remember/LOCQ)]
- (c) Which interactive feature in the next generation of mobile phones can have the most disruptive influence on how mobile phones are used? Justify your answer from the perspective of human-computer interaction (HCI). [[CO5](Apply/IOCQ)]
- (3 + 3) + 4 + 2 = 12**
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Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	62.50	18.75	18.75

Course Outcome (CO):

After the completion of the course students will be able to

1. Understand the structure of models and theories of human computer interaction.
2. Identify basic concepts, terminology, theories, models and methods in the field of Human Computer Interaction
3. Understand basics of interactive designing, how to prototype, iterate and refine based on the standard principles and guidelines.
4. Understand the socio organizational issues in cognitive models. Be able to identify the key players and their requirements.
5. Understand how users interact with mobile apps and widgets and design such mobile ecosystems.
6. Design an interactive web interface based on the different models studied.

*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question.