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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

END SEMESTER EXAMINATION-2015

B.Tech VIII / M.Tech II Semester

COURSE CODE:10M11CI212

MAX. MARKS: 45

COURSE NAME: Advanced Operating Systems

COURSE CREDITS: 3

MAX. TIME: 3 HRS

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*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

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**Section A**

Q1) Imagine a Web server that maintains a table in which client IP addresses are mapped to the most recently accessed Web pages. When a client connects to the server, the server looks up the client in its table, and if found, returns the registered page. Is this server stateful or stateless?

[2 marks]

Q2) Describe how connectionless communication between a client and a server proceeds when using sockets.

[2 marks]

Q3) In reliable multicasting, is it always necessary that the communication layer keeps a copy of a message for retransmission purposes?

[2 marks]

Q4) Give some examples of applications where the use of mobile code is beneficial.

[2 marks]

Q5) Distinguish between buffering and caching.

[1 marks]

**Section B**

**4.5X5= 13.5**

Q1) Consider two communication services for use in asynchronous distributed systems. In service A, messages may be lost, duplicated or delayed and checksums apply only to headers. In service B, messages may be lost, delayed or delivered too fast for the recipient to handle them, but those that are delivered arrive order and with the correct contents. Describe the classes of failure exhibited by each service. Classify their failures according to their effect on the properties of validity and integrity. Can service B be described as a reliable communication service?

Q2) The Election interface provides two remote methods:

vote: with two parameters through which the client supplies the name of a candidate (a string) and the 'voter's number' (an integer used to ensure each user votes once only). The voter's numbers are allocated sparsely from the range of integers to make them hard to guess.

result: with two parameters through which the server supplies the client with the name of a candidate and the number of votes for that candidate.

Which of the parameters of these two procedures are input and which are output parameters?

Q3) a) Discuss whether the following operations are idempotent:

- i. Pressing an elevator call button
- ii. Sorting a list
- iii. Appending to a file

Is it a necessary condition for idempotence that the operation should not be associated with any state?

b) Explain Christians algorithm?

#### Section C

Q4) With asynchronous RPCs, a client is blocked until its request has been *accepted* by the server. To what extent do failures affect the semantics of asynchronous RPCs? [5 marks]

Q5) a. Give an example how the closure mechanism for a URL would work? [2.5 marks]

b. Explain various types of Data centric consistency models? [5 marks]

Q6) In the two-phase commit protocol, why can blocking never be completely eliminated, even when the participants elect a new coordinator? [5 marks]

Q7) Explain RSA? [5 marks]

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