M. Sc (Informatics), IV-Semester, 2017
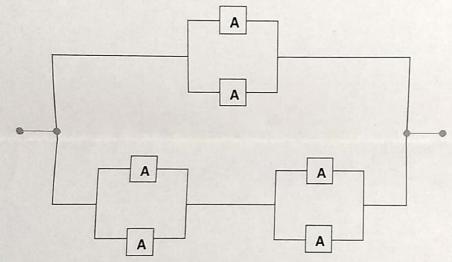**IT-42, TELECOMMUNICATION AND NETWORK MANAGEMENT**

Time: 3hrs   Max. Marks: 75

(Write your Roll No. on the top immediately on receipt of this question paper)

Attempt five questions in all. Q.1 is compulsory.

Q.1 Each question-part carries 3 marks:

a) Define the following terms:
  - SNMP Community
  - SNMP Community Profile
  - SNMP Access Policy

b) Discuss the key requirements for a Fault Monitoring System?

c) Calculate the availability of following system:

d) Using a memory address stack show how the data-word "INFORMATICS" will be stored in:
  i. Network-byte order
  ii. Host-byte order

e) Discuss the significance of "*requestId*" parameter in SNMP PDUs?

Q.2

a) Discuss in detail the architecture and components of a traditional SNMPv3 Manager?
(7)

b) What is meant by *trap-directed polling*? Explain the *polling* and *event-reporting* mechanisms comparing the advantages and disadvantages over the other? (4)

c) Explain in detail how Configuration management is carried out in a Network Management system? Why is it important for a system having multiple tiers/levels? (4)

Q.3

a) Define the following terms: (5)

      i.   *snmpEngineId*
      ii.   *snmpSecurityLevel*
      iii. *Abstract Service Interface*
      iv. *snmpwalk*
      v.   *SNMPv3 principal*

b) Explain the significance of "Proxy Manager" architecture? Discuss more taking an example of a SNMPv2 manager needing to interact with a SNMPv1 agent? **(5)**

c) What are "Basic Encoding Rules" and discuss the usage in context with ASN.1 types. **(5)**

Q.4

a) Explain diagrammatically SNMPv3 primitive flow for:
    i.   Command Generator Application
    ii.   Command Responder Application **(7)**

b) Draw the format and explain working of *getBulkRequest()* PDU in SNMPv2? **(6)**

c) Define SNMP? **(2)**

Q.5

a) Explain the syntax and working of Message processing sub-system primitive "*prepareResponseMessage (...)* **(5)**

b) Write pseudo-code for a concurrent client-server model (using *fork()*). Describe the different APIs used in the pseudo-code. **(5)**

c) A *Sample Table* having Object ID `1.3.6.1.2.12.1.6.1.8.1` is shown below. **(5)**

ConnTime	RemoteAddress	MsgCount	Port
201700090430	192.168.1.1	11789	2000
201700090430	192.168.1.3	11789	2000
201700090431	192.168.1.4	21789	2000
201700090432	192.168.1.4	31389	2001

    i. Explain briefly the random access technique for accessing the columnar objects?

    ii. Propose a suitable INDEX for the table above such that each row can be uniquely identified?

    iii. After completing step ii, mention the Object Identifier for the second instance of "*RemoteAddress*".

    iv. After completing step ii, mention the Object Identifier for the fourth instance of "*MsgCount*".

Q.6

a) Discuss the enhancements introduced by SNMPv2 over SNMPv1 governing Table access and row creation/deletion techniques. **(5)**

b) Explain briefly the three requirements addressed by Security Management. Also, explain the different categories of threats during information transmission? **(5)**

c) Explain the significance of AUGMENTS clause in SNMPv2? **(2)**

d) Define the following terms: **(3)**
    i.   select (...)   ii. RAW socket iii. setsockopt (...)