Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

VII SEMESTER B.TECH. (INFORMATION TECHNOLOGY/COMPUTER AND COMMUNICATION ENGINEERING)

END SEMESTER EXAMINATIONS, NOVEMBER 2018

SUBJECT: PROGRAM ELECTIVE-V SOFTWARE DEFINED NETWORKS [ICT-4004]

REVISED CREDIT SYSTEM
(29 /11 /2018)

Time: 3 Hours MAX. MARKS:

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data, if any, may be suitably assumed.

1A. Write the Mininet command

i. To view the IP address of a node
ii. To enable visibility and control over a single switch's flow table.
iii. To check maximum throughput (in Mbps) for the OpenFlow network.
iv. To deploy the policy using MAC address on a specific port **5**

1B. Explain any four problems with current OpenFlow hardware that motivated the design of a programmable control plane. **3**

1C. Suppose a RouteBricks router with one intermediate switching stage and 5 servers, each with five 2 Gbps ports. Calculate the required per-server processing rate, assuming that traffic is not necessarily uniform? **2**

2A. What are the benefits of layer 2 architecture over layer 3 in a datacenter? Explain the role of SDN in designing layer 2 topological architecture. **5**

2B. Write a POX algorithm for Mininet switch to operate as a HUB . **3**

2C. A network designer is seeking a solution to quickly deploy the policies into the network components. From the survey it is identified that SDN with a good controller will fulfill requirements but the designer is not having any knowledge of a controller. The designer is expecting a controller with GUI support with good performance and also it should have support for the cloud. Which controller do you suggest for the designer? How does your suggestion help to fulfill the designer's requirements? **2**

3A. Assume that there are two storage servers deployed in a private network one for video traffic (port 80) and another for non-video traffic. Clients will send the data to the gateway of the private network. Write a sequential policy to share the load between two storage servers at gateway assuming that gateway is SDN enabled. **5**

3B. A customer wanted to deploy a home network in which it is expected to have facility to view on the data left, device monitoring facility to study a which device getting capped, a support for network slicing for different applications, and also remote operating facility. Design an appropriate solution using SDN. **3**

3C. What is network slicing? Explain how Flowvisor helps in network management? **2**

4A. Explain how does "CLICK" architecture make a data plane into programmable data plane. **5**

4B. Explain possible ways of creating virtual links in a virtual network **3**

4C. Write and explain any two benefits of SDN enabled network over traditional network **2**

5A. Suppose that an operator of a network organization wants to write the following policies. Block all traffic of Facebook from office computer, Rate limit BitTorrent traffic from office computer if the VoIP client on the desktop is active. And assume that "facebook" represents Facebook IP addresses, that "BitTorrent" represents BitTorrent ports, and that "limitifVOIP" is a dynamic policy that checks a Resonance-like state machine to determine whether VOIP traffic has recently been observed. Write a sequential/parallel policy to satisfy this requirement. **5**

5B. What are the drawbacks of BGP (Border Gateway Protocol) in IXP? How does SDN helps to overcome the problems associated with the BGP? **3**

5C. A cellular network provider is willing to offer different types of application for his user. Explain how SDN helps him to provide different application with desired QoS. **2**