



Mapping of CO and PO								
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	1	–	2	–	–	–	1
CO2	2	3	2	2	–	–	–	1
CO3	2	2	–	3	1	2	–	1
CO4	1	2	2	3	–	–	–	2

Content:		
Unit	SECTION-I	Hrs
1	<b>Cloud enabling Technologies:</b> Service Oriented Architecture – REST and Systems of Systems – Web Services – Publish Subscribe Model – Basics of Virtualization – Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization – System VM, Process VM, VM provisioning process, VM Migration techniques, Virtual Machine monitor – Virtual machine properties - Interpretation and binary translation, VM - Hypervisors – Xen, KVM , VMWare, Virtual Box, Hyper-V	8
2	<b>Cloud Architecture, Services and Storage:</b> Layered Cloud Architecture Design– Public, Private and Hybrid Clouds – IaaS – PaaS – SaaS – Architectural Design Challenges – Cloud Storage – Storage-as-a-Service – Advantages of Cloud Storage – Cloud Storage Providers – S3	7
SECTION-II		
3	<b>Management and Monitoring:</b> Service quality metrics and SLAs (service level agreements), SLA Guidelines, cloud usage monitor, SLA Management, Introduction to Monitoring, Needs for monitoring, Cloud monitoring tools, Resource Allocation and Pricing in Cloud	7
4	<b>Cloud Middleware:</b> OpenStack, OpenNebula, Windows Azure, CloudSim, EyeOs, Aneka, Google App Engine, Amazon EC2, CloudSim	8
Practical Content:		
List of programs specified by the subject teacher based on above mentioned topics.		
Text Books:		
1	Rajkumar Buyya, James Broberg, Andrzej M Goscinski, Cloud Computing: Principles and Paradigms, Wiley publication	
Reference Books:		
1	Toby Velte, Anthony Velte, Cloud Computing: A Practical Approach, McGraw-Hill Education 2017.	
2	Thomas Erl, Z Mahmood and Ricardo Puttini, Cloud computing concepts, technology and architecture, Publisher : PHI; 1st edition (23 May 2013).	
MOOC/Certification Courses:		
1	<a href="https://onlinecourses.nptel.ac.in/noc23_cs27/preview">https://onlinecourses.nptel.ac.in/noc23_cs27/preview</a>	
2	<a href="https://www.edx.org/course/google-cloud-computing-foundations-cloud-computing-fundamentals">https://www.edx.org/course/google-cloud-computing-foundations-cloud-computing-fundamentals</a>	
3	<a href="https://www.edx.org/course/aws-cloud-technical-essentials">https://www.edx.org/course/aws-cloud-technical-essentials</a>	
4	<a href="https://www.edx.org/course/introduction-to-cloud-computing-6">https://www.edx.org/course/introduction-to-cloud-computing-6</a>	
5	<a href="https://nptel.ac.in/courses/106105167">https://nptel.ac.in/courses/106105167</a>	

**Question Paper Scheme:****University Examination Duration: 3 Hours**

Note for Examiner: -

(I) Questions 1 and 4 are compulsory with no options.

(II) Internal options should be given in questions 2, 3, 5 and 6.

**SECTION – I**

Q.1 –8 Marks

Q.2 –11 Marks

Q.3 –11 Marks

**SECTION - II**

Q.4 –8 Marks

Q.5 –11 Marks

Q.6 –11 Marks