

MASTER OF COMPUTER APPLICATIONS (MCA_NEW)

MCA_NEW 3rd Semester Assignments

(January,2026 & July,2026 sessions)

MCS-224, MCS-225, MCS-226, MCS-227

MCSL-228, MCSL-229



**SCHOOL OF COMPUTER AND INFORMATION SCIENCES
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
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Important Notes

1. Submit your assignments to the Coordinator of your Study Centre on or before the due date. Also, be in touch with concerned IGNOU RC for any updates on Assignments schedule etc.
2. Assignment submission before due dates is compulsory to become eligible for appearing in corresponding Term End Examinations. For further details, please refer to Programme Guide of MCA_NEW.
3. To become eligible for appearing the Term End Practical Examination for the lab courses, it is essential to fulfill the minimum attendance requirements as well as submission of assignments (on or before the due date). For further details, please refer to the Programme Guide of MCA_NEW.
4. The viva voce is compulsory for the assignments. For any course, if a student submitted the assignment and not attended the viva-voce, then the assignment is treated as not successfully completed and would be marked as ZERO.

Course Code	:	MCS-227
Course Title	:	Cloud Computing and IoT
Assignment Number	:	MCA_NEW(III)/227/Assign/2026
Maximum Marks	:	100
Weightage	:	30%
Last Dates for Submission	:	30th April, 2026 (for January session) 31st October, 2026 (for July session)

This assignment has twenty questions of 80 Marks. Answer all questions. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

- Q1:** Define Cloud Computing. List and explain the four categories of cloud deployment models. Differentiate between cluster, grid and cloud computing with respect to its characteristics, physical structure, hardware, resources, applications, networking and scalability features.
- Q2:** Define resource sharing in cloud computing. What is Tenancy in context of cloud computing? Explain the implementation of single tenancy and multi-tenancy types of resource sharing in cloud computing.
- Q3:** Define resource pooling in cloud environment. In this context, explain the following:
- Server Pools
 - Storage Pools
 - Network Pools
- Q4:** Explain the differences between cloud computing, Fog computing and Edge computing. Draw a block diagram of Cloud-Fog-Edge collaboration and explain all its layers.
- Q5:** Draw the block diagram of 3-layer architecture of fog computing and explain all its layers. Also, with the help of a block diagram, explain the 4-levels in Cloud architecture.
- Q6:** What is an Hypervisor? Compare the functionality of Type-1 and Type-2 Hypervisor with the help of suitable block diagram for each, also give advantages and disadvantages of each.
- Q7:** Define virtualization. Explain its underlying abstraction. Also mention the features provided by virtualization environment. Also, describe various Hypervisor based virtualization approaches like full virtualization, para virtualization and hardware assisted virtualization.
- Q8:** What is Internet of Things (IoT)? What are the characteristics of IoT? List and explain the various components used to implement IoT. Also explain industrial IoT, infrastructure IoT and internet of military things (IoMT) categories of IoT.
- Q9:** What is scalability in Cloud Computing? Explain the Proactive Scaling and Reactive Scaling strategies. Also, describe Auto scaling in cloud? Write and explain fixed amount auto scaling algorithm, with the help of a suitable example.
- Q10:** Explain the following communication protocols with reference to the IoT devices :
- IPv6
 - MQTT
 - CoAP
 - XMPP
- Q11:** Define Load Balancing. Explain the following algorithms with reference to load balancing :

- a. Static algorithm approach
 - b. Weighted Round Robin
- Q12:** Compare Xenserver vs VMware with respect to the features like Guest O/S support, Backup facility, Thin provisioning, asset management and configuration mapping, dynamic resource allocation and failover, graphics support, licensing, host server management and storage specifications.
- Q13:** Explain the term VM(Virtual Machine) sizing. Also, discuss the two ways to do VM sizing, give suitable example for each.
- Q14:** Define a sensor with reference to an IoT device. Explain various characteristics of sensors. Also, mention and explain all classifications of sensors.
- Q15:** Briefly discuss any two (for each of the sector) Use Cases of IoT in the following sectors:
 (a) Agriculture (b) Transportation
- Q16:** Discuss the following baseline technologies of IoT:
- i. Security in IoT
 - ii. IoT Analytics
 - iii. IoT Processors
 - iv. IoT Standards and Ecosystems
- Q17:** Explain the following computing components used in laboratories of IoT/Cloud :
- a. Arduino
 - b. Raspberry Pi
- Q18:** Discuss the following Service Delivery Models of Cloud, with an example for each:
- a. Platform as a Service (PaaS)
 - b. Infrastructure as a Service (IaaS)
 - c. Software as a Service (SaaS)
- Also, explore the features, benefits and relevant use cases for other service models like Security as a Service (SECaaS), Database as a Service (DBaaS), Analytics as a Service (AaaS) and API as a Service (APIaaS).
- Q19:** “Cloud Computing offers a variety of deployment models, a network connection viewpoint will be used to examine Cloud deployment models and their accessible components.” With reference to this statement, discuss the following types of network connectivities:
- a. Public Inter cloud Networking
 - b. Private Inter cloud Networking
 - c. Public Intra cloud Networking
 - d. Private Intra cloud Networking
- Q20:** Write short notes on the following:
- a. Multi homing and its types
 - b. Horizontal scaling in cloud environment
 - c. Challenges in cloud computing
 - d. Applications of edge computing