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# PES University, Bengaluru
(Established under Karnataka Act No. 16 of 2013)

**UE17CS352/18CS352**

## DECEMBER 2020: END SEMESTER ASSESSMENT (ESA) B TECH VI SEMESTER

## UE17CS352/18CS352 – Cloud Computing

| Time: 3 Hrs | Answer All Questions | Max Marks: 100 |
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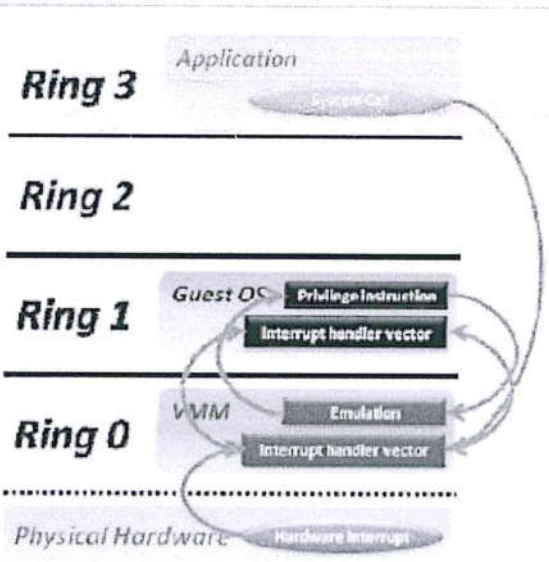
| 1 | a) | Three applications are developed on the cloud – App1 is access using a browser on the cloud, App2 is installed on virtual machine and App3 is built using a cloud based database service. Classify the three into IaaS/PaaS and SaaS models with a justification. Also, give a real life example of IaaS/PaaS/SaaS platform. | 5 |
| | b) | What is meant by elasticity in cloud computing? Suggest two simple techniques to handle elasticity? | 5 |
| | c) | Briefly explain the major concepts of REST (any 3) with an example? | 5 |
| | d) | Enumerate the steps that are required for starting a VM in an IaaS platform? | 5 |
| | | | |
| 2 | a) | What is the difference between Baremetal and Hosted Hypervisors? Give an example of both. | 5 |
| | b) | What does the following image represent? Explain what are rings and what to the arrows represent?.   | 5 |
| | c) | What are namespaces with respect to containers? Give an example of types of namespaces in linux | 5 |
| | d) | Given below is the cgroups definition for an nginx application. What does this enforce?<br>Group nginx { cpu {cpu.shares = 300;} memory {memory.limit_in_bytes=1g;}} | 5 |
| | | | |
| 3 | a) | What is the difference between ephemeral and persistent disks? For the following cases which of the above will you use – (i)swap space of the OS and (ii)database indexes | 5 |

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| | b) | Given the following object name in openstack, identify the account, container and object name<br>*/v1/pesuacademy/cloudcomputing/slides/unit3/slide4.pptx* | 5 |
| | c) | Consider a cloud based storage to store the following two types of data in a social media application<br>What types of data decomposition scheme will pick for the design? Justify | 5 |
| | d) | You are asked to design a multitenant database for two universities – *ModernUniv* and *SuperUniv* to store information about students. *ModernUniv* wants to store USN, student names and email ids while *SuperUniv* wants to store USN, student names and grades. Design a multitenant database using the preallocated column method for the same clearly showing the tables. | 5 |

| Database | Access Pattern | Size |
|---|---|---|
| User Profile Pictures | Updated daily by user and viewed by many friends | 10 million entries overall |
| Transactions | Many updates per day | 10 million entries/day |

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| 4 | a) | What is a microservice application and how is it different from a regular monolithic application? | 5 |
| | b) | What is the difference between scale-up and scale-out? Which of the strategies will you use when the number of users of your application increase to about 100 and you are unable to satisfy the requests on the current machine and why? (3+2) | 5 |
| | c) | You have been asked to design the cloud storage for a new application to store all the details of courses in a university including course information, syllabus, slides and notes for the users. Will you use a NoSQL or SQL database? Justify your choice? | 5 |
| | d) | What are scheduler, kubelets and pods in Kubernetes? Explain with a diagram where each of them execute – one master or worker? | 5 |
| 5 | a) | What are soft and hard constraints in a resource scheduler like Nova? Give examples of both | 5 |
| | b) | Compute the number of minutes a system must be available in a year if it is designed for 0.99998 availability? Show the working | 5 |
| | c) | Briefly explain leader election in a ring. | 5 |
| | d) | In a cloud system, how will you protect against (i) hard drive failure (ii) loss of a PC connected to cloud | 5 |