(Pages : 4) **N – 1767**

Reg. No. : .....

Name : .....

Sixth Semester B.C.A. Degree Examination, April 2022

Career Related First Degree Programme under CBCSS

Group 2(b) – Computer Applications

Core Course

CP 1642 – OBJECT ORIENTED ANALYSIS AND DESIGN

(2018 & 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A [Very Short Answer Type]

(One word to maximum of two sentences. Answer ALL questions. Each question carries 1 marks)

1. What is the identity of an object?

2. _____ defines the relationship among classes where one class shares the structure or behavior of another defined class.

3. The process of compartmentalizing the elements of an abstraction that constitute its structure and behavior is called as _____

4. Define dependency in a class diagram.

5. A UML diagram that facilitates requirements gathering and interacts between system and external users, is called as _____

6. Define multiplicity.

P.T.O.

7. Write the use of the deployment diagram?

8. Which diagram is used to show interactions between messages are classified as?

9. What is an interface?

10. Define state in the state chart diagram.

(10 × 1 = 10 Marks)

SECTION – B [Short Answer Type]

(Not to exceed one paragraph, answer any **eight** questions. Each question carries **2** marks)

11. Discuss the significance of inheritance.

12. What is the behavior of an object?

13. What does the responsibility of an object mean?

14. List out the characteristics of algorithmic decomposition?

15. What is the interface of a class?

16. What is a class diagram?

17. What are the benefits of class diagrams?

18. Define unified modeling language.

19. What are the differences between the data flow diagram and UML?

20. Define interaction diagram.

21. List out the benefits of a sequence diagram.

22. Why did you use messages in a collaboration diagram?

23. What is the role of actors in a collaboration diagram?

24. Define concurrent activities in the activity diagram.

25. What is a join node in the activity diagram?

26. How will you represent an interface in UML?

(8 × 2 = 16 Marks)

SECTION – C [Short Essay]

(Not to exceed 120 words, answer any **six** questions. Each question carries **4** marks)

27. Differentiate abstraction and encapsulation.

28. What is a class in object-oriented concepts?

29. Elaborate on the advantages of object-oriented decomposition.

30. Compare extends and include relationships in the use case diagram.

31. Identify the primary goals in the design of UMIL.

32. Differentiate between generalization and association.

33. Describe the use of an interaction diagram.

34. Specify the significance of the collaboration diagram.

35. Write a note on links in collaboration diagrams.

36. Elaborate on different types of states in state chart diagram.

37. Draw and explain different components used to draw an activity diagram.

38. Mention the purposes of drawing the activity diagram.

(6 × 4 = 24 Marks)

SECTION – D [Long Essay]

Answer any **two** questions. **Each** question carries **15** marks.

39. Describe the object-oriented themes:

    (a) Polymorphism

    (b) Inheritance

40. What is a class diagram? Draw a class diagram for the library management system.

41. With the help of an example explain the concept of the use case diagram.

42. What is a sequence diagram? Draw and explain different components of a sequence diagram.

43. What is a component diagram? Draw and explain the notation of a component diagram.

44. What is a deployment diagram? Explain with an example.

(2 × 15 = 30 Marks)

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Name : .....

Sixth Semester B.C.A. Degree Examination, April 2022

Career Related First Degree Programme under CBCSS

Group 2(b)-Computer Applications

CP 1644 : TRENDS IN COMPUTING

(2018 & 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A [Very Short Answer Type]

(One word to maximum of **two** sentences. Answer **all** questions. **Each** question carries **1** mark)

1. What is virtualization?

2. Define utility computing.

3. What does the abbreviation PaaS mean?

4. What type of computing technology refers to services and applications that typically run on a distributed network through virtualized resources?

5. What does the abbreviation SOA mean?

6. Define scalability in edge computing.

7. Write any two applications of edge computing.

8. What does mobile edge computing do?

P.T.O.

9. What is a fuzzy set?

10. What is an artificial neuron?

(10 × 1 = 10 Marks)

SECTION – B [Short Answer Type]

(Not to exceed one paragraph, answer any **eight** questions. Each question carries **2** marks)

11. Define internet clouds.

12. Why did you use cloud computing?

13. Give the characteristics of cloud models.

14. What is SaaS?

15. What are computing clusters?

16. What is on-demand computing?

17. What are the characteristics of SOA?

18. What are the different types of web services?

19. What is edge computing?

20. What is an edge site?

21. Define grid computing.

22. What is the significance of distributed computing?

23. What is mobile edge computing?

24. Define activation function in neural networks.

25. How will you represent a fuzzy set?

26. What are membership functions in a fuzzy set?

(8 × 2 = 16 Marks)

SECTION – C [Short Essay]

(Not to exceed **120** words, answer any **six** questions. Each question carries **4** marks)

27. What are the characteristics of cloud computing?

28. What is community cloud? Discuss its advantages.

29. Describe the characteristics of IaaS.

30. What are P2P networks? Explain.

31. Mention the components of SOA with a block diagram.

32. Discuss the challenges in edge computing.

33. Why do you use edge computing?

34. Explain grid layered architecture in detail.

35. Explain mobile edge computing reference architecture.

36. Differentiate between soft computing and hard computing.

37. Compare the performance of computer and biological neural networks.

38. What are the applications of fuzzy logic?

(6 × 4 = 24 Marks)

SECTION – D [Long Essay]

(Answer any **two** questions. Each question carries **15** marks)

39. What is cloud computing? Explain cloud computing architecture in detail.

40. Discuss the advantages and disadvantages of cloud storage in detail.

41. What are the different types of clouds? Explain in detail.

42. What are the applications of edge computing? Explain.

43. Describe in detail supervised training and unsupervised training in neural networks.

44. What are the application areas of neural networks? Explain.

(2 × 15 = 30 Marks)

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Sixth Semester B.C.A. Degree Examination, April 2022

Career Related First Degree Programme Under CBCSS

Group 2(b) – Computer Applications

Core Course

CP 1643 – DESIGN AND ANALYSIS OF ALGORITHMS

(2018 & 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. **Each** carries **1** mark.

1. Define space complexity.
2. What is data structure?
3. What is a tree?
4. Define Omega notation.
5. What do you mean by a linear data structure?
6. What is a path?
7. Define graph.
8. What is a spanning tree?
9. What is the purpose of Kruskal's algorithm?
10. What are deterministic algorithms?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer **any eight** questions. **Each** carries **2** marks.

11. Write a short paragraph on algorithm analysis.
12. What is selection?
13. Write the best, worst and average time complexity of merge sort.
14. Explain divide and conquer method.
15. What is knapsack problem?
16. Write a note on binary search.
17. Describe big O notation
18. What do you mean by dynamic programming?
19. List any five sorting algorithms.
20. What is backtracking?
21. When do you say an algorithm is good?
22. What do you mean by time complexity of an algorithm?
23. What is Euler graph?
24. Describe shortest path problem.
25. State 8 queen's problem.
26. Define walk in a graph.

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six** questions. **Each** carries **4** marks.

27. Write the algorithm for binary search.
28. Write a paragraph on Travelling Salesperson's problem.
29. Explain the properties of a good algorithm.

30. Write the three traversal algorithms of binary search tree.

31. Write a note on LC search.

32. Briefly explain non-deterministic algorithms.

33. Write down Prim's algorithm.

34. Compare Euler and Hamiltonian graph. Illustrate with examples.

35. Explain divide-and-conquer method in merge sort.

36. Differentiate NP-hard and NP-complete problem.

37. Write a detailed note on recursive algorithms.

38. Explain the working of Euler tour technique.

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two** questions. **Each** carries **15** marks.

39. Write and explain the quick sort algorithm.

40. Discuss the importance of time complexity and space complexity.

41. Explain Strassen's matrix multiplication.

42. Write down and explain Kruskal's algorithm.

43. Explain in detail about decision problems.

44. What is the application of Knapsack problem? Explain the two types of Knapsack problem.

(2 × 15 = 30 Marks)

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Name : .....

Sixth Semester B.Sc./B.C.A. Degree Examination, April 2022

Career Related First Degree Programme Under CBCSS

Group 2 (b) – Computer Science/Computer Applications

Core Course /Elective Course

CS 1642/CP 1661.3 – INTERNET OF THINGS (IoT)

(2018 & 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

(Very Short Answer type)

(One word to maximum of one sentence. Answer **all** questions)

1. What is digitization?
2. Expand IMA.
3. BLE stands for ————————.
4. Which is the de facto communication protocol responsible for building automation?
5. How many layers are there in IoTWF architecture?
6. NAN stands for ————————.
7. CoAP stands for ————————.

P.T.O.

8. Expand MQTT.

9. Name the network which is made up of wirelessly connected smart objects, and are sometimes referred to as motes.

10. Expand OCTAVE.

(10 × 1 = 10 Marks)

SECTION – B

(Short Answer)

(Not to exceed one paragraph, answer **any eight** questions. Each question carries **2** marks).

11. What do you mean by connected roadways?

12. What is connected cow?

13. What is PAN? What is the technology used in this?

14. What do you mean by point-to-point topology?

15. What is WiMax technology?

16. What is an actuator?

17. What is track forwarding?

18. What is FAIR?

19. What is push-to-talk communication?

20. What are the disadvantages of WSNs?

21. Mention the four types of MAC frames as specified in 802.15.4.

22. How RTLS works?

23. What do you mean by scale of an IT network?

24. What is the role of edge computing layer in IoT reference architecture?

25. Mention any 4 types of actuators.

26. What do you mean by event driven transmission in WSN?

(8 × 2 = 16 Marks)

SECTION – C

(Short Essay)

(Not to exceed 120 words, answer **any six** questions. Each question carries **4** marks).

27. What are the main challenges faced by manufacturing in factory environment?

28. Explain the functions of BACnet protocol.

29. What are the measures taken by IoT systems for optimum security?

30. What are the achievements of IoTWF standardized architecture?

31. Explain the different layers in core functional IoT stack.

32. What are the different data related problems that need to be addressed in IoT?

33. What are the characteristics of fog computing?

34. How are sensors classified?

35. Explain MEMS.

36. Explain the smart objects in public safety.

37. Explain the role of mobile command center in emergency response IoT architecture.

38. What is the duty of gateways and backhaul network sublayer in core IoT functional stack?

(6 × 4 = 24 Marks)

SECTION – D

(Long Essay)

(Answer **any two** questions. Each question carries **15** marks)

39. Explain the concept of smart connected buildings.

40. Compare the features of OT and IT networks.

41. Explain the challenges in Internet of Things.

42. Explain the oneM2M IoT architecture.

43. Explain the key advantages of IP suite for Internet of Things.

44 Explain how traffic flows across IT and OT networks.

(2 × 15 = 30 Marks)

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Reg. No. : .....

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Sixth Semester B.C.A. Degree Examination, April 2022

Career Related First Degree Programme under CBCSS

Group 2(b) – Computer Applications

Core Course

CP 1641 – MULTIMEDIA SYSTEMS

(2018 & 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A [Very Short Answer Type]

(One word to maximum of **two** sentences. Answer **ALL** questions. **Each** question carries **1** marks)

1. A video consists of a sequence of _____
2. JPEG is used to compress _____
3. How many channels are specified in the MIDI standard?
4. How many attributes control the characteristics of sound?
5. Which image compression technique provides some loss of quality?
6. Expand the term PAL.
7. What is the simple definition of the image?
8. What do you mean by an 8-bit image?

9. What is image resolution?

10. Define the period of a waveform?

(10 × 1 = 10 Marks)

SECTION – B [Short Answer Type]

(Not to exceed **one** paragraph, answer any **eight** questions. **Each** question carries **2** marks)

11. List the characteristics of a multimedia system.

12. What are the significances of DVDs?

13. Define hypermedia.

14. What is the significance of using speakers in multimedia?

15. Write a note on image data types.

16. Define image processing technique.

17. What is image compression in multimedia?

18. What is the image file format?

19. What is interlaced scanning?

20. Does frame rate affect video quality? Explain.

21. What is SECAM?

22. Why did you use I-frame in video compression?

23. What is the amplitude of a sound wave?

24. What are formants in the spectrum of audio signals?

25. How does sound represent in the computer?

26. Write a note on NTSC.

(8 × 2 = 16 Marks)

SECTION – C [Short Essay]

(Not to exceed **120** words, answer any **six** questions. Each question carries **4** marks)

27. What is hypertext? Mention its advantages.

28. Explain the significance of CD-ROM drives.

29. What are sound cards?

30. Compare spatial resolution and temporal resolution of images.

31. What is the difference between grayscale image and color image?

32. How is animation useful in multimedia?

33. Explain the JPEG image format in detail.

34. Compare frame rate and resolution.

35. Explain video artifacts in detail.

36. Differentiate between analog videos and digital videos.

37. What are the different types of MIDI messages? Explain.

38. Describe the components of speech recognition and understanding.

(6 × 4 = 24 Marks)

SECTION – D [Long Essay]

(Answer any **two** questions. **Each** question carries **15** marks).

39. What is multimedia? Explain different multimedia hardware devices in detail.

40. Explain the following multimedia hardware components.

    (a) Soundcards

    (b) Microphones

    (c) Video camera

41. Explain the following computer image processing techniques in detail.

    (a) Image synthesis

    (b) Image analysis

42. Describe different image data compression techniques in detail.

43. Explain different types of computer video formats in detail.

44. Define speech analysis and speech transmission techniques? Explain in detail.

(2 × 15 = 30 Marks)
