Seat No. : _____

# DE-101

**December-2018**

**BCA., Sem.-III**

**CC-205 : Statistical Computing**
**(Old Syllabus)**

**Time : 2:30 Hours]** **[Max. Marks : 70**

**Instructions :** (1) Use of scientific calculator is allowed.
(2) Figures to the right indicate marks.

1. (A) (1) Find mean and mode from following set of points : 7

| X | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
|---|---|---|---|---|---|---|---|---|
| f | 18 | 16 | 15 | 12 | 10 | 5 | 2 | 1 |

(2) Find the missing frequencies in the following table given that median of the data is 54 and total frequency is 120 7

| **Class** | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
|---|---|---|---|---|---|
| **Frequency** | 12 | – | 35 | – | 11 |

**OR**

(1) Calculate median and mode from the following data.

| **Class** | 0-7 | 7-14 | 14-21 | 21-28 | 28-35 | 35-42 |
|---|---|---|---|---|---|---|
| **Frequency** | 7 | 11 | 24 | 19 | 12 | 9 |

(2) Find GM and HM

| **Diameter** | 33-35 | 36-38 | 39-41 | 42-44 | 45-47 |
|---|---|---|---|---|---|
| **No. of items** | 17 | 19 | 23 | 21 | 27 |

(B) Do as directed : (any **four**) 4

(1) State the relation among mean, median and mode.

(2) Define weighted mean.

(3) Give an example for which AM and GM are equal.

(4) What is mode ?

(5) State which average will be appropriate, when the quantities are in ratio.

2. (A) (1) Calculate the SD of the following data. 7

| Class | 0-20 | 20-40 | 40-60 | 60-80 | 80-100 | 100-120 | 120-140 |
|---|---|---|---|---|---|---|---|
| Frequency | 9 | 17 | 43 | 82 | 81 | 44 | 24 |

(2) Explain with suitable examples the term 'dispersion'. Mention some common measures of the dispersion and describe the one which you think to be most important of them. 7

**OR**

(1) Find Q1 and D9 for the following frequency distribution :

| Class | 30-35 | 35-40 | 40-45 | 45-50 | 50-55 | 55-60 | 60-65 |
|---|---|---|---|---|---|---|---|
| Frequency | 3 | 5 | 12 | 18 | 14 | 6 | 2 |

(2) State and discuss the various measures of the dispersion.

(B) Do as directed : (any **four**) 4

(1) Define percentile.

(2) State the relationship between MD and QD.

(3) In a distribution of 10, 20, 30, 40, 50, and x is 30, the sum of deviations from x will be_____.

(4) Find the range of the series 20, 2, 15, 30, 15, 30, 10 and 50.

(5) State the formula for CV.

3. (A) (1) Obtain the coefficient of the correlation for data given below. 7

| X | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Y | 9 | 8 | 10 | 12 | 11 | 13 | 14 |

(2) (i) Explain regression and correlation 7

(ii) What are the regression coefficients? State their properties.

**OR**

(1) Define :

(i) Correlation (ii) Regression (iii) Dispersion (iv) Positive correlation (v) Negative correlation (vi) Multiple correlation (vii) Partial correlation

(2) From the following data find two lines of the regression.

| X | 16 | 20 | 17 | 21 | 15 |
|---|---|---|---|---|---|
| Y | 50 | 60 | 58 | 60 | 55 |

(B) Do as directed : (Any **three**) 3

(1) Draw the rough sketch of the scatter diagram for the correlation coefficient: 0.9.

(2) Find r, if the regression coefficients are -0.8 and -0.56.

(3) State the relation between regression coefficients and correlation coefficient.

(4) What is least squares method ?

4. (A) (1) There are 4 white and 3 red in box B1 and 4 red and 3 white balls in the box B2. A coin is tossed. If coin shows head box B1 is selected and two balls drawn at random from it and otherwise box B2 is selected and two balls are drawn at random from it. What is the probability that both selected balls white ? 7

(2) Three people are shooting at a target. The probabilities that they hit the target are 0.5, 0.6 and 0.8. 7

(i) Find the probability that all three hit the target.

(ii) Find the probability that all three miss the target.

**OR**

(1) Define :

(i) Probability (ii) Sample space (iii) Exclusive events (iv) Exhaustive events (v) Equally likely events (vi) Addition rule (vii) Independent events

(2) Prove that (i) X' and Y (ii) X' and Y' are independent events, if X and Y are independent events. 3

(B) Do as directed : (any **three**)

(1) State the multiplication rule for the probability.

(2) State the range of the probability.

(3) If $P(A) = 0.3$, $P(B) = 0.4$ and $P(A \cup B) = 0.6$, $P(B \mid A) =$ _____.

(4) If A and B are independent events, $P(A \mid B) =$ _____.

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P.T.O.

Seat No. : 119

# DE-101

**December-2018**

**BCA., Sem.-III**

**CC-205 : Statistical Methods**
**(New)**

**Time : 2:30 Hours]** **[Max. Marks : 70**

**Instructions :** (1) Use of scientific calculator is allowed.
(2) Figures to the right indicate marks.

1. (A) (1) Define the term statistics. Discuss various functions and the importance of the statistics. 7

(2) From the data given below of the three types of some item, calculate an average price per item. 7

| Type | Price per item (in ₹) | Money spent (in ₹) |
|---|---|---|
| X | 1.00 | 50 |
| Y | 1.50 | 30 |
| Z | 2.00 | 20 |

**OR**

(1) For the data given that median is 46, find the missing values.

| X | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | Total |
|---|---|---|---|---|---|---|---|---|
| f | 12 | 30 | – | 65 | – | 25 | 18 | 229 |

(2) What do you understand by central representative of the data? Discuss various measures of the central representative with examples.

(B) Do as directed : (any **four**) 4

(1) For the calculation of speed _____ used. (AM, GM, HM)

(2) The presence of the extreme observations does not affect ____. (Mean, Median, Mode)

(3) _____ is the mean of the first n-natural numbers.

(4) Define HM.

(5) The positional measure of the central tendency is also called_____.

2. (A) (1) Define the term variation; explain different measures of variations and its significance. 7

(2) Calculate the mean deviation about median for the following data : 7

| Class | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 |
|---|---|---|---|---|---|---|
| Frequency | 6 | 7 | 15 | 16 | 4 | 2 |

**OR**

(1) Mean and standard deviation of a group of 100 observations were found to be 20 and 3, respectively. Later on it was found that 3- observations were incorrect, which were recorded as 18, 21 and 21. If these incorrect observations are omitted, find the new mean and standard deviation.

(2) From the prices of items A and B below, find out which is more stable in value:

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 49 | 51 | 50 | 52 | 58 | 56 | 53 | 52 | 54 | 35 |
| B | 101 | 104 | 103 | 104 | 107 | 106 | 105 | 105 | 107 | 108 |

(B) Do as directed : (any **four**) 4

(1) Third decile for the observations 15, 10, 20, 25, 18, 11, 9 and 12 is _____.

(2) State formula for inter-quartile range.

(3) State relationship about MD, QD and SD.

(4) If SD for the data $x_1, x_2, x_3, \ldots\ldots, x_k$ is S, then SD of $2018 + x_1$, $2018 + x_2$, $2018 + x_3$, ....., $2018 + x_k$ is _____.

(5) Define percentile.

3. (A) (1) Discuss various types of the correlation with the scatter diagrams. 7

(2) From the following data, obtain a regression line : 7

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| X | 14 | 19 | 24 | 21 | 26 | 22 | 15 | 19 | 20 |
| Y | 31 | 36 | 48 | 37 | 50 | 45 | 33 | 39 | 41 |

**OR**

(1) Discuss the various methods for measuring correlation between two variables.

(2) Calculate regression coefficients and correlation coefficient from the data given below.

| X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| Y | 9 | 8 | 10 | 12 | 11 | 13 | 14 | 16 | 15 |

(B) Do as directed : (any **three**) 3

(1) State the types of the data for which rank correlation gives better correlation.

(2) What is least square method ?

(3) State the range of coefficient of correlation.

(4) Say True/False: Both the regression coefficients and correlation coefficient always must have same sign.

4. (A) (1) Bag I contains 4 white and 6 black balls while another Bag II contains 4 white and 3 black balls. One ball is drawn at random from one of the bags and it is found to be black. Find the probability that it was drawn from Bag I. 7

(2) A and B are two events such that $P(A) = 0.54$, $P(B) = 0.69$ and $P(A \cap B) = 0.35$. Find (i) $P(A \cup B)$ (ii) $P(A' \cap B')$ (iii) $P(A \cap B')$ (iv) $P(B \cap A')$. 7

**OR**

(1) There are two therapies Tl and T2 available for curing a patient suffering from a certain disease. The patient can choose any one of the two therapies. If he selects Tl the probability of his recovery from the disease is 7/8 and if he selects therapy T2 the probability of his recovery the disease is 9/10. Given that the patient is cured, what is the probability that he has selected therapy T2 ?

(2) Prove that (i) A' and B (ii) A and B' are independent events, if A and B are independent events.

(B) Do as directed : (any **three**) 3

(1) The probability of drawing a club card from a pack of cards is _____.

(2) Events are said to be equally likely, if_____.

(3) Find the probability of getting an integer 2 in a single toss of a die, given that a prime number is obtained.

(4) If A and B are independent events, p(A / B) = _____.

(5) State the multiplication rule for the probability.

_____

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# DD-101

**December-2018**

**B.C.A., Sem.-III**

**CC-204 : Fundamentals of Operating System**
**(Old Course)**

**Time : 2:30 Hours]** **[Max. Marks : 70**

1. (A) Answer the following :

(1) Differentiate between the roles of an OS as a memory manager and a processor manager. 7

(2) What are Semaphores ? State the operations that can be performed on a semaphore. 7

**OR**

(1) What are process states and transitions ? Explain the following transitions : 7

(i) READY → RUNNING → READY

(ii) RUNNING → WAIT → READY

(2) Given the following information : 7

| Process | CPU Cycle (Burst Time) | Arrival Time |
|---|---|---|
| P1 | 14 | 0 |
| P2 | 7 | 1 |
| P3 | 9 | 3 |
| P4 | 2 | 5 |

Draw the time line and calculate the average turnaround time and average waiting time using :

(i) First Come First Serve (FCFS)

(ii) Round Robin Algorithm (Time Quantum=5msec)

(B) Answer the following : (any **four**) 4

(1) _____ Jobs have small I/O cycles and long CPU cycles.

(2) The process of increasing the priority of the process so as to get them executed is called _____.

(3) When a job never gets the CPU it goes into a situation of _____.

(4) The time required by the OS to switch from one job to another is called _____ time.

(5) Round Robin is an example of a _____ scheduling policy.

(6) The number of jobs getting executed in a given amount of time is called the _____.

2. (A) Answer the following :

(1) Consider that the disk where tracks are numbered from 0 to 49. It takes 1 ms to travel from one track to another. Assume that currently the read/write head is positioned at track 12.

Given the following track requests :

7, 45, 28, 39, 18, 25, 2

Calculate average seek time (average number of tracks traveled) using FCFS and SSTF. 7

(2) Explain using example the difference between Deadlock and starvation. 7

**OR**

(1) Giving an example explain the situation of a deadlock. What are the conditions of deadlock ? 7

(2) What do you understand by Safe and Unsafe states ? Give example to explain your answer. 7

(B) Answer the following : (any **four**) 4

(1) A traffic jam is a representation of a situation of a _____.

(2) In printers mutual exclusion can be removed by the concept of _____.

(3) _____devices are allocated to several processes.

(4) _____ is an example of a dedicated device.

(5) The full form of RAID is _____.

(6) The concept of _____ is used to minimize the speed mismatch between high speed CPU and slow speed I/O devices.

3. (A) Answer the following :

(1) Explain the difference between fixed partition and dynamic partition. 7

(2) What is a page map table ? Explain its content. 7

**OR**

(1) What is demand paging ? Explain how demand paging justifies the existence of virtual memory ? 7

(2) Explain the concept of segmented memory allocation ? 7

(B) Answer the following : (any **three**) 3

(1) Transfer of pages between the main memory and secondary memory is called _____.

(2) The part of the operating system which handles the page fault is called the _____.

(3) Excessive amount of swapping between main memory and secondary memory is called ____.

(4) A failure to find a page in the main memory is called a _____.

(5) In paged memory allocation the program is divided into _____.

4. (A) Describe the following :

(1) Explain and differentiate non-contiguous and indexed storage allocation of files. 7

(2) What is data compression ? Explain three different methods of data compression. 7

**OR**

(1) Differentiate between default passwords and backdoor passwords. 7

(2) What is the requirement of an access control list ? How is it different from a capability list ? 7

(B) Answer the following : (any **three**)

(1) In _____ all records are of same size.

(2) In _____ records trailing blank spaces are truncated.

(3) A _____ protects a single file from unauthorized access.

(4) What is spoofing ?

(5) What is encryption ?

_____

Seat No. : 119.

# DD-101

December-2018

B.C.A., Sem.-III

CC-204 : Fundamentals of Operating System
(New Course)

Time : 2:30 Hours]

[Max. Marks : 70

1. (A) Answer the following :

(1) What is an operating system ? Which are the various types of operating system ? Explain each with example. 7

(2) Differentiate between fixed partition and dynamic partition. 7

**OR**

(1) Explain the difference between the roles of an OS as a Process Manager and a Processor Manager. 7

(2) Differentiate between paged memory allocation and demand paging 7

(B) Answer the following : (any **four**) 4

(1) Define page fault.

(2) State the contents of Page Map table in paged memory allocation.

(3) Define internal fragmentation

(4) What is thrashing ?

(5) All pages are of the same size whereas _____ are of different sizes.

(6) The process of transfer of pages between the main memory and secondary memory is called _____.

2. (A) Answer the following :

(1) Which are the four different states a process can be in ? Discuss the six different transitions between these states. 7

(2) Using an example explain Burst Time, Waiting Time and Turnaround Time. Also, state relationship between them. 7

**OR**

(1) Given the following information : 7

| Process | CPU Cycle (Burst Time) | Arrival Time |
|---|---|---|
| P1 | 9 | 0 |
| P2 | 6 | 1 |
| P3 | 4 | 2 |
| P4 | 8 | 4 |

Draw the time line and calculate the average turnaround time and average waiting time using:

(i) Shortest Job Next (SJN)

(ii) Round Robin (Time Quantum : 5msec)

(2) What do you understand by preemptive and non-preemptive scheduling policy of a process ? Give two examples of each. 7

(B) Answer the following : (any **four**) 4

(1) Define throughput.

(2) What is a process ?

(3) What is the role of a Job scheduler ?

(4) Give the full form of PCB.

(5) _____ jobs have long CPU cycle and small I/O cycle.

(6) The time required by the OS to switch from one job to another is called _____ time.

3. (A) Answer the following :

(1) What are deadlocks ? Using an example explain how the conditions of 'mutual exclusion' and 'no preemption' lead to a situation of deadlocks. 7

(2) What are semaphores ? What are the operations that can be performed on a semaphore ? Also, explain how using semaphores process synchronization can be achieved. 7

**OR**

(1) Using an example explain what are safe and unsafe states to deal with deadlocks. 7

(2) Explain the test and set lock method to achieve process synchronization. What is its drawback and how can it be overcome. 7

(B) Answer the following : (any **three**) 3

(1) Define starvation.

(2) Process P1 holds resource R1 and requests for R3. Draw a directed graph.

(3) Define parallel processing.

(4) _____ is the condition of deadlock when a resource holds a resource and requests for another resource.

(5) Lack of process synchronization leads to _____ or _____.

4. (A) Answer the following :

(1) Consider that the disk where tracks are numbered from 0 to 49. It takes 1 ms to travel from one track to another. Assume that currently the read/write head is positioned at track 14. 7

Given the following track requests :

5, 45, 28, 33, 18, 25, 12

Calculate average seek time (average number of tracks traveled) using SSTF and LOOK.

(2) Explain and differentiate non-contiguous and indexed storage allocation of files. 7

**OR**

(1) What are virtual devices ? Explain how the concept of spooling makes a printer work as a virtual device. 7

(2) What is data compression ? Explain the three different methods of data compression. 7

(B) Answer the following : (any **three**) 3

(1) CSW stands for _____.

(2) _____ are devices which are assigned to only one job at a time.

(3) _____ are used to minimize speed mismatch between high speed CPU and slow speed I/O devices.

(4) Record format of two types : _____ and _____.

(5) Give full form of DMA.

_____

Seat No. : _____

# DA-101

**December-2018**

**B.C.A., Sem.-III**

**CC-201 : Computer Organization and Advanced Microprocessor**
**(Old Course)**

**Time : 2:30 Hours]** **[Max. Marks : 70**

**Instructions :** (1) Begin new answer on a new page.
(2) Draw diagrams wherever necessary.
(3) Figures to the right indicate full marks.

1. (A) Answer the following :
   (i) Explain instruction format with example. 7
   (ii) Write a note on interrupts and its types. 7

   **OR**

   (i) Explain Von Neumann Architecture with block diagram.
   (ii) Write a note on bus with its usage.

   (B) Attempt any **four** out of **six** : 4
   (i) The ratio of pulse width to time period is called _____.
   (ii) In IEEE representation of single precision floating point number, mantissa is of _____ bits.
   (iii) _____ bit is used to represent negative sign in signed magnitude form.
   (iv) _____ stores the result of the last processing step of the ALU.
   (v) 11000-10000 using 1's complete is _____.
   (vi) The CPU states can be divided into two: _____ and Running.

2. (A) Answer the following :
   (i) Define Encoder. Write a note on Decimal-to-BCD Encoder. 7
   (ii) Draw logic circuit and truth table of JK flip-flop. 7

   **OR**

   (i) Define Multiplexer. Explain 4X1 MUX with appropriate diagrams.
   (ii) Draw schematic diagram and truth table of full adder.

(B) Attempt any **four** out of **six** : 4

(i) _____ is two-state device which offers basic memory cell for sequential logic operations.

(ii) In half adder, the carry output is a simple _____ function and the sum is an exclusive-OR function.

(iii) A _____ is a device which essentially performs the opposite operation to the multiplexer.

(iv) _____ and _____ gates are called universal gates.

(v) Octal-to-Binary encoder takes _____ inputs and gives _____ outputs.

(vi) _____ flip-flop acts as a toggle switch.

3. (A) Answer the following :

(i) Write a note on associative memory. 7

(ii) What is mapping ? Write a note on direct mapping in cache memory. 7

**OR**

(i) Write a note on cache coherence with its solution.

(ii) Discuss various parameters to choose a memory.

(B) Attempt any **three** out of **five** : 3

(i) The performance of the cache is measured in terms of _____ ratio.

(ii) Cycle time (Tc) = _____ + Recovery Time (Tr).

(iii) Magnetic tape is an example of _____ access memory.

(iv) _____ is the access time taken by the first access in a series of accesses.

(v) _____ algorithm chooses the block frame that has been referenced by the CPU very less number of times from the time it was mapped onto the cache memory.

4. (A) Answer the following :

(i) Write a note on functional unit of 8086. 7

(ii) Compare CISC and RISC processors. 7

**OR**

(i) Classify and explain various addressing modes of 8086.

(ii) Discuss mobile and tablet processors.

(B) Attempt any **three** out of **five** : 3

(i) A _____ processor allows instruction level parallelism within a single processor.

(ii) In _____ addressing mode, operand is a part of the instruction.

(iii) _____ address determines how far is the memory location from the starting address of the segment register.

(iv) A _____ is a digital computer built on a single chip used to control application.

(v) Intel 8086 is a _____ bit microprocessor that operates in two modes - minimum mode and maximum mode.

_____

Seat No. : 118.

# DA-101

**December-2018**

**B.C.A., Sem.-III**

**CC-201 : Computer Organization**
**(New Course)**

**Time : 2:30 Hours]** **[Max. Marks : 70**

**Instructions :** (1) Begin new answer on a new page.
(2) Draw diagrams wherever necessary.
(3) Figures to the right indicate full marks.

1. (A) Answer the following :

(i) Write a note on 4-bit synchronous binary counter. 7

(ii) Explain half-adder circuit with logic diagram. Also show the use of half-adder modules to construct NAND and NOR gates. 7

**OR**

(i) Explain 2-to-4 line decoder with NAND gates.

(ii) Define register. Explain 4-bit register with parallel load.

(B) Attempt any **four** out of **six** : 4

(i) The output of _____ gate is 1 if any input is 1 but excludes the combination when both inputs are 1.

(a) XOR (b) XNOR
(c) NAND (d) NOR

(ii) In SR flip-flop, if S=1 and R=0 when C (CLK) changes from 0 to 1, output Q is set to _____.

(a) 0 (b) 1
(c) No change (d) Indeterminate

(iii) The _____ family provides the highest-speed digital circuits in integrated form which is used in systems such as supercomputers and signal processors where high speed is essential.

(a) TTL (b) ECL
(c) CMOS (d) DTL

(iv) A _____ is a group of flip-flops with each flip-flop capable of storing one bit of information.

(a) Encoder (b) Decoder

(c) Multiplexer (d) Register

(v) Flash memory is a form of _____ in which a block of bytes can be erased in a very short duration.

(a) ROM (b) PROM

(c) EPROM (d) EEPROM

(vi) A register capable of shifting its binary information in one or both directions is called a _____ register.

(a) Shift (b) Unidirectional

(c) Bidirectional (d) Load

2. (A) Answer the following :

(i) Write a note on 4-bit binary adder-subtractor. 7

(ii) Explain one stage of arithmetic logic shift unit with function table. 7

**OR**

(i) Write a note on 4-bit arithmetic circuit with function table.

(ii) Explain error detection with odd parity bit.

(B) Attempt any **four** out of **six** : 4

(i) The standard alphanumeric binary code is the _____, which uses seven bits to code 128 characters.

(a) ANSI (b) BCD

(c) ASCII (d) UNICODE

(ii) A floating-point number is said to be normalized if the most significant digit of the mantissa is _____.

(a) Non-zero (b) Zero

(c) Signed (d) Unsigned

(iii) A three-state gate is a digital circuit that exhibits three states : 0, 1 and_____.

(a) Low-impedance (b) High-impedance

(c) Medium-impedance (d) None of these

(iv) The transfer of information from a memory word to the outside environment is called a _____ operation.

(a) Complement (b) Execute

(c) Read (d) Write

(v) There are three types of shift microoperations for serial transfer of data - logical, circular and _____.

(a) Left-right (b) Physical

(c) Rotate (d) Arithmetic

(vi) 2's complement of 1010 is _____.

(a) 0111 (b) 1011

(c) 0110 (d) 1110

3. (A) Answer the following :

(i) Write a note on 16-bit common bus system. 7

(ii) Explain instruction cycle with flowchart. 7

**OR**

(i) List out and explain memory-reference instructions.

(ii) Explain any three addressing modes with the help of an appropriate numerical example.

(B) Attempt any **three** out of **five** : 3

(i) Bit Z (zero) is set to _____ if the output of the ALU contains all 0's.

(a) Zero (b) 1

(c) –1 (d) 0

(ii) In the _____ organization, the control logic is implemented with gates, flip-flops, decoders and other digital circuits.

(a) Hardwired control (b) Microprogrammed control

(c) Control memory (d) None of these

(iii) When IEN is _____, the flags can not interrupt the computer.

(a) 0 (b) 1

(c) ION (d) None of these

(iv) Non-embedded computer architectures are basically _____ architectures in which programs and data reside in the same memory system.

(a) RISC (b) SPC

(c) CISC (d) DSP

(v) The mode bit - I is _____ for a direct address and _____ for an indirect address.

(a) 0, 0 (b) 1, 0

(c) 0, 1 (d) 1, 1

4. (A) Answer the following :

(i) Explain source-initiated and destination-initiated transfer using handshaking. 7

(ii) Explain associative memory with block diagram. 7

**OR**

(i) Explain DMA with block diagram of DMA controller.

(ii) Explain any one type of mapping procedure in organization of cache memory with an appropriate example.

(B) Attempt any **three** out of **five** : 3

(i) The average time required to reach a storage location in memory and obtain its contents is called the _____ time.

(a) Seek (b) Access

(c) Mean (d) None of these

(ii) _____ allows the DMA controller to transfer one data word at a time, after which it must return control of the buses to the CPU.

(a) Burst transfer (b) Cycle stealing

(c) Priority encoder (d) Daisy-chaining priority

(iii) The performance of cache memory is frequently measured in terms of a quantity called _____ ratio.

(a) Heat (b) High

(c) Low (d) Hit

(iv) Input output devices attached to the computer are also called

(a) Peripherals (b) Read-Write

(c) Workspace (d) None of these

(v) In the _____ configuration, the CPU has distinct input and output instructions, and each of these instructions is associated with the address of an interface register.

(a) Memory-Mapped I/O (b) Isolated I/O

(c) Both (d) None of these

Seat No. : _____

# DC-101

**December-2018**

**B.C.A., Sem.-III**

**CC-203 : Object Oriented Concepts and Programming**
**(Old Course)**

**Time : 2:30 Hours]** **[Max. Marks : 70**

1. (A) (1) Give the difference between OOP and POP. 7
   (2) Write a short-note on Reference Variables in C++. 7

   **OR**

   (1) Write a short-note on function prototyping in C++.
   (2) Write a short-note on Inline Function in C++.

   (B) Answer the following : (Any **four**) 4
   (1) Define Object.
   (2) What is Encapsulation ?
   (3) _____ are reserved words whose meaning is already been defined for a particular language.
   (a) Keywords (b) Variables
   (c) Arguments (d) None of these
   (4) What is 'this' pointer ?
   (5) Which operator is known as insertion operator ?
   (6) What is 'bool' data type in C++ ?

2. (A) (1) Give the difference between Constructor and Destructor. 7
   (2) Explain Array of Class Object with example. 7

   **OR**

   (1) What is Friend Class ? Explain with example.
   (2) Write a short-note on Copy Constructor with example.

   (B) Answer the following : (Any **four**) 4
   (1) What is nested member function ?
   (2) _____ are those members whose members are accessed by all the objects of a class.
   (a) Static data members (b) Constant data members
   (c) Mutable data members (d) None of these
   (3) What is Friend Function ?
   (4) Define Namespace.
   (5) What is nested class ?
   (6) Which operator is used to allocate memory dynamically during run-time ?

3. (A) (1) Explain Inheritance using different access specifier in detail. 7

(2) Write a short-note diamond-shaped inheritance. 7

**OR**

(1) What is Inheritance ? Explain different forms of inheritance.

(2) Explain the Type casing the pointer with example.

(B) Answer the following : (Any **three**) 3

(1) What is virtual table ?

(2) What is pure virtual function ?

(3) What is virtual pointer ?

(4) What is early binding ?

(5) What is the main difference between function overloading and function overriding ?

4. (A) (1) Write a program of Overload the Binary Operator +, –, *, and / using friend Functions. 7

(2) Explain Nested Class Templates with example. 7

**OR**

(1) Write a C++ program to initialize the data member of base class using the constructor of derived class.

(2) How to convert a data of class type to basic type? Explain with example.

(B) Answer the following : (Any **three**) 3

(1) Which are the operators that can't be overloaded ?

(2) What is operator function ?

(3) What is function template ?

(4) What do you mean by operator overloading ?

(5) The destructors in the class hierarchy are always invoked in the _____ order of the constructor invocation.

(a) reverse (b) same

(c) execution (d) None of these

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Seat No. : _____

# DC-101

**December-2018**

**B.C.A., Sem.-III**

**CC-203 : Object Oriented Concepts and Programming**
**(New Course)**

**Time : 2:30 Hours]** **[Max. Marks : 70**

1. (A) (1) What is Arrow Operator ? Explain with example 7
   (2) How to define the Function outside the class body ? Explain with example. 7

   **OR**

   (1) Write a short-note on Default Arguments in C++.
   (2) Write a short-note on Function Overloading in C++.

   (B) Answer the following : (Any **four**) 4
   (1) Give the full from of POP.
   (2) What is the data abstraction ?
   (3) How to give the comments in C++ ? Give small example of it.
   (4) What is the main difference between public and private access specifier in C++ ?
   (5) Define Class.
   (6) A/An _____ is an instance of class.
   (a) object (b) variable
   (c) keyword (d) None of these

2. (A) (1) Explain Dynamic Memory Allocation and De-allocation in C++ with example. 7
   (2) What is Constructor ? Explain the characteristics of it in detail. 7

   **OR**

   (1) Explain Friend Member Function with example.
   (2) What is static member function ? Explain with example.

   (B) Answer the following : (Any **four**) 4
   (1) What is namespace in C++ ?
   (2) A constructor that has zero parameter lists is called
   (a) Default Constructor (b) Parameterized Constructor
   (c) Copy Constructor (d) None of these
   (3) What is 'Memory leakage' problem ?
   (4) What is Constant member function ?
   (5) What is Destructor ?
   (6) What is Mutable data member ?

3. (A) (1) Explain Virtual destructor with example. 7

(2) Explain the Hybrid Inheritance with example. 7

**OR**

(1) Give the difference between Compile-time Polymorphism and Run-time Polymorphism.

(2) What is Virtual Base class ? Explain with example.

(B) Answer the following : (Any **three**) 3

(1) Define Inheritance.

(2) What is Abstract class ?

(3) Define VTBL.

(4) What is function overriding ?

(5) What is Polymorphism ?

4. (A) (1) How to convert a data of basic type to class type ? Explain with example. 7

(2) Write a simple program to demonstrate class template. 7

**OR**

(1) Write a program to concatenate two string by overloading binary '+' operator.

(2) Explain the function template with multiple parameters using example.

(B) Answer the following : (Any **three**) 3

(1) What is the purpose of istream and ostream class ?

(2) What is the use of put() function for text mode output operation ?

(3) Define the get() and getline() functions for text mode input operations ?

(4) What is class template ?

(5) Operator overloading is a/an _____ polymorphism.

(a) compile time (b) run time

(c) executable (d) None of these

Seat No. : 319

# DB-101

December-2018

B.C.A., Sem.-III

CC-202 : Data Structures
(Old & New Course)

Time : 2:30 Hours] [Max. Marks : 70

1. (A) Answer the following :

(1) Write an algorithm to insert an element at beginning and delete an element from end in a doubly linked list. 7

(2) Explain selection sort technique with example. Also write an algorithm to sort an array elements using selection sort. 7

**OR**

(1) What is linked list ? List out types of linked list. Explain structure and representation of doubly linked list with example. 7

(2) Explain binary search technique with example. Also write an algorithm to search an element in array using binary search technique. 7

(B) Do as directed. (Any **Four**) 4

(1) Give the difference between array and linked list.

(2) Write Formula to find address of the element in one dimensional array.

(3) Define data structure.

(4) Draw the classification of data structure.

(5) What is sparce matrix ?

(6) For Linear search, elements _____ order in the list.

(a) must be stored in sorted

(b) must be stored in unsorted

(c) may be stored in sorted or unsorted

(d) none of these



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3. (A) (1)

2. (A) Answer the following :

(1) Show the stack status after each operation in the conversion of following expression to postfix : A + (B * C – (D/E – F) * G) *H

(2) Write an algorithm to insert and delete an item from a queue using linked list. 7

OR

(1) What is queue ? List out types of queue. Explain Insert and Delete operations of circular queue with example.

(2) Write an algorithm for push, pop and peep operations of stack.

(B) Do as directed. (Any **Four**) 4

(1) List out stack notations.

(2) Stack is_____ data structure.

(a) FIFO

(b) FCFS

(c) LIFO

(d) None of these

(3) Define priority queue.

(4) Write any two applications of stack.

(5) _____ is very useful in situation when data have to be stored and then retrieved in reverse order.

(a) Stack

(b) Queue

(c) Linked list

(d) None of these

(6) Which data structure allows inserting and deleting data elements at either end ?

(a) Deques

(b) Queue

(c) Circular queue

(d) None of these

3. (A) Answer the following :

(1) Explain one-way and two-way threaded binary tree with example.

(2) Write steps to create expression tree. Create an expression tree for following expression. (M–N)* Z + P/(X + Z) 7

**OR**

(1) What is Binary tree ? Write algorithms for in-order, pre-order, and post-order traversals of binary tree.

(2) Write steps to create binary search tree. Create binary search tree with the following data :

25, 15, 10, 4, 12, 22, 18, 24, 50, 35, 31, 44, 70, 66, 90

(B) Define following terms : (Any **Three**) 3

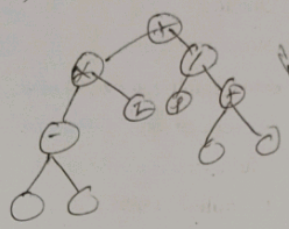
(1) Complete binary tree

(2) Leaf node

(3) Root node

(4) Sibling

(5) Degree of a node



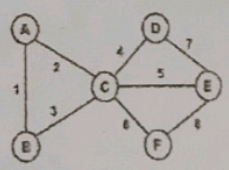
4. (A) Answer the following :

(1) Write algorithm for Breadth first search traversal. Explain Breadth first search with example. 7

(2) Explain Dijkstra's algorithm with proper example. 7

**OR**

(1) What is minimum spanning tree ? Write Kruskal's algorithm. Find the minimum spanning tree using Kruskal's algorithm.




(2) What is graph ? Explain different representations of graph with example.

(B) Do as directed. (Any **Three**)

(1) Define Multi-graph.

(2) Which node has zero degree ?

(a) Source

(b) Sink

(c) Isolated

(d) None of these

(3) Give full form of MST. multi

(4) ____is a non-linear data structure.

(a) Stack

(b) Graph

(c) Queue

(d) None of these

(5) A directed graph that has no cycles is called _____.

(a) Acyclic graph

(b) Multi graph

(c) Complete graph

(d) None of these